AUS | الجامعة الأميركية في الشارقة
American University of Sharjah

# UNDERGRADUATE CATALOG
# 2020–2021

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**His Highness Sheikh Dr. Sultan bin Muhammad Al Qasimi**

Supreme Council Member, Ruler of Sharjah
President of American University of Sharjah

# Chancellor's Message

Since its founding by His Highness Sheikh Dr. Sultan bin Muhammad Al Qasimi, Member of the Supreme Council of the United Arab Emirates and Ruler of Sharjah, American University of Sharjah (AUS) has earned a reputation for providing transformative educational experiences and a rich multicultural campus environment. The diverse AUS campus community offers a range of opportunities for intellectual growth and personal development.

A dedicated staff and accomplished full-time faculty members distinguish the university. As an AUS student, you will benefit from the faculty's commitment to teaching and their engagement in research, scholarship and creative activity.

This catalog provides an overview of the university's programs and policies, and will serve as your guide to academic life. If you require additional information about the programs or policies, please contact the relevant office and we will assist you.

I am pleased to welcome you to AUS, and I look forward to your contributions to enriching the campus community.

Kevin Mitchell

Chancellor

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  - Mr. Rami Mahfouz, Director, Enrollment Services
- Dr. Linda Angell, Director, International Exchange Office
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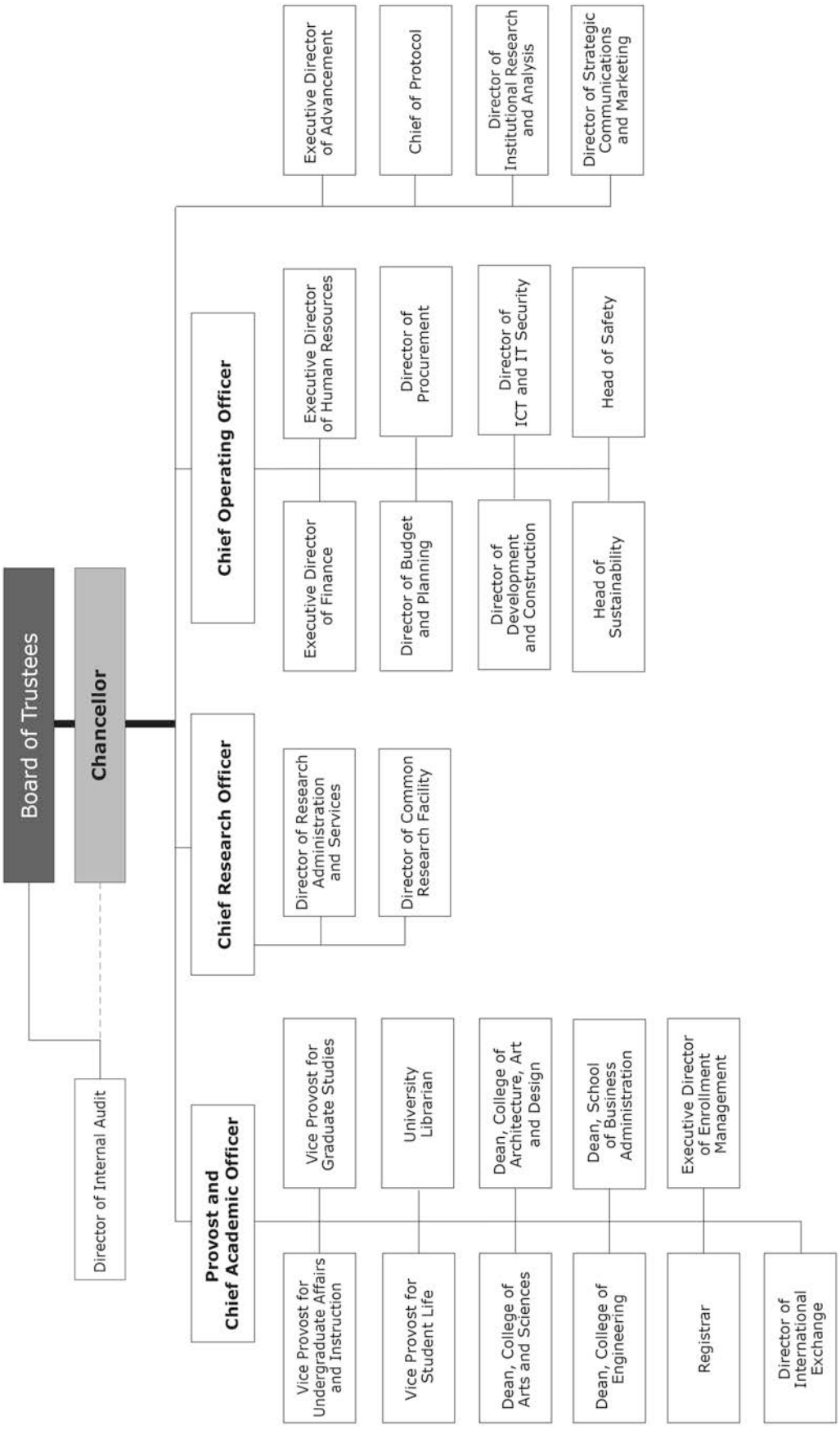
- Mr. Jayant Menon, Director, Supply Chain

**Dr. Wei Zhao, Chief Research Officer**

- Ms. Kathleen Furr, Director, Research Administration and Services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Executive Director of Advancement
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Vice Provost for Graduate Studies
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Dean, School of Business Administration
Executive Director of Enrollment Management
Vice Provost for Undergraduate Affairs and Instruction
Vice Provost for Student Life
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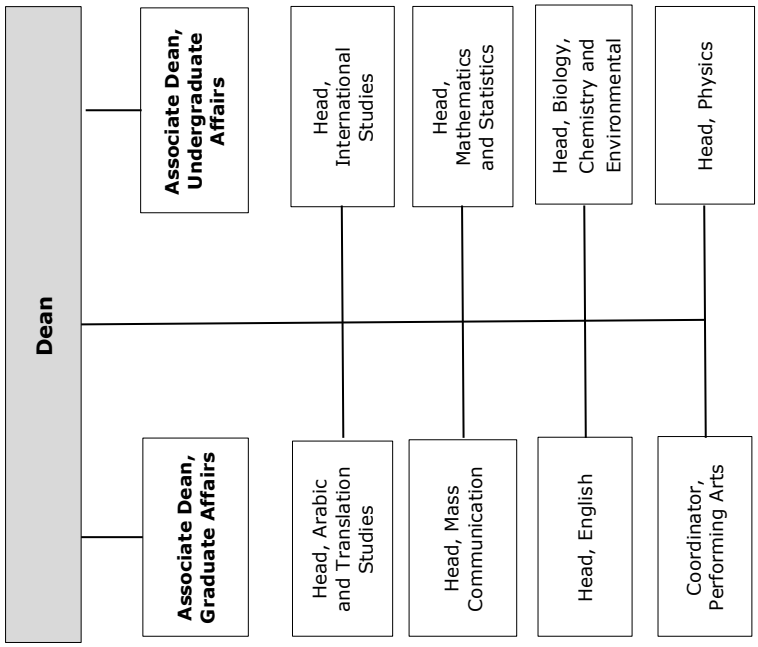
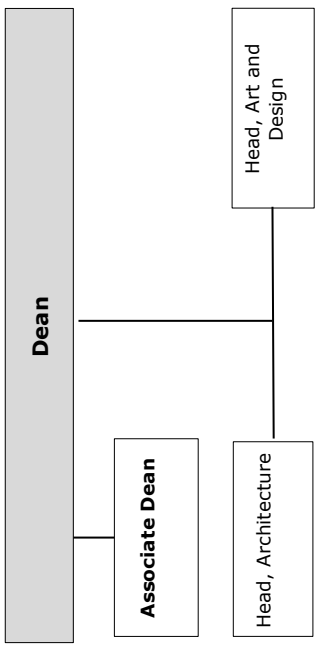
Dean, College of Engineering
Registrar
Director of International Exchange

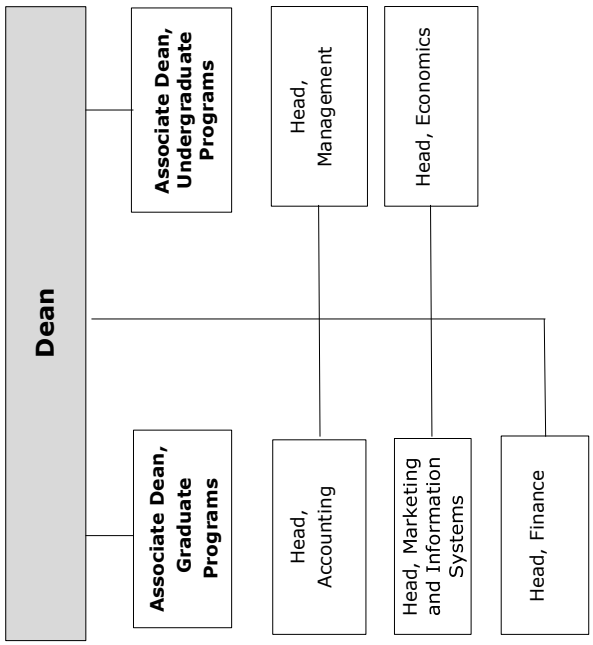
## College of Arts and Sciences



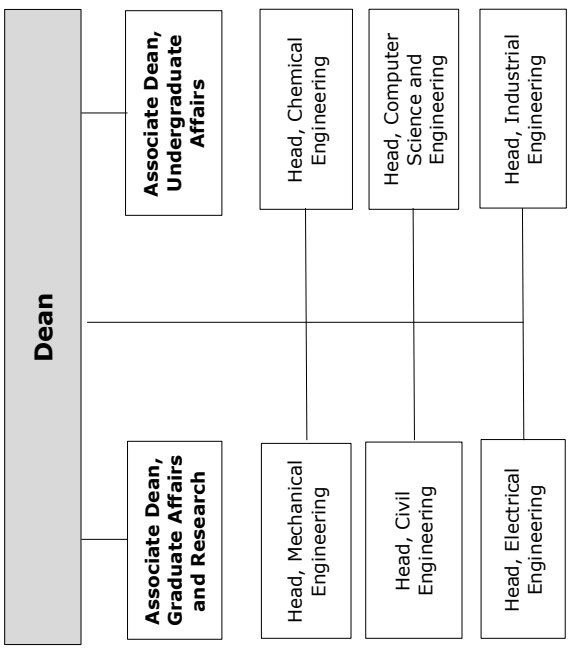

## College of Architecture, Art and Design



## School of Business Administration




## College of Engineering



# Undergraduate Academic Calendar 2020–2021

Updates to this calendar will be posted at www.aus.edu/academic-calendar

| | | | |
|---|---|---|---|
| **Fall Semester 2020** | | | |
| **June** | 18 | Thursday | Early application deadline for Fall Semester 2020 |
| **July** | 16 | Thursday | Admissions application deadline for Fall Semester 2020 |
| **August** | 20 | Thursday | Residential halls open<br>TOEFL test |
| | 21 | Friday | Welcome session for new students and parents |
| | 22 | Saturday | New student academic orientation |
| | 24 | Monday | Registration for all returning students ends, 5:00 p.m. |
| | 24–25 | Monday–Tuesday | Placement tests for new students |
| | 26–27 | Wednesday–Thursday | Registration for new students |
| | 30 | Sunday | First day of classes<br>Late registration and add/drop period begin |
| **September** | 1 | Tuesday | Late registration and add/drop period end, 5:00 p.m. |
| | 24 | Thursday | Applications for Fall Semester 2020 graduation due |
| **October** | 29 | Thursday | No classes (university closed): Al Mawlid Al Nabawi holiday* |
| **November** | 5 | Thursday | Honors Convocation |
| | 8 | Sunday | Deadline to withdraw from a course without a grade penalty, 5:00 p.m. |
| | 17 | Tuesday | Advising and early registration for Spring Semester 2021 begins |
| **December** | 1–3 | Tuesday–Thursday | No classes (university closed): Commemoration Day and UAE National Day holiday |
| | 13 | Sunday | Last day of classes |
| | 14–22 | Monday–Tuesday | Study and examination period |
| | 23 | Wednesday | Make-up examination day |
| | 24 | Thursday | Admissions application deadline for Spring Semester 2021 |
| | 26 | Saturday | Fall Semester 2020 Commencement** |
| **Spring Semester 2021** | | | |
| **January** | 21 | Thursday | Residential halls open<br>TOEFL test |
| | 22 | Friday | Welcome session for new students and parents |
| | 23 | Saturday | New student academic orientation |
| | 25 | Monday | Registration for all returning students ends, 5:00 p.m. |
| | 25–26 | Monday–Tuesday | Placement tests for new students |
| | 27–28 | Wednesday–Thursday | Registration for new students |
| | 31 | Sunday | First day of classes<br>Late registration and add/drop period begin |
| **February** | 2 | Tuesday | Late registration and add/drop period end, 5:00 p.m. |
| | 20 | Saturday | Class make-up day (Wednesday schedule) |
| | 25 | Thursday | Applications for Spring Semester 2021 graduation due |
| **March** | 25 | Thursday | Applications for Summer Term 2021 graduation due |
| | 28–1 (April) | Sunday–Thursday | No classes: Spring Break |
| **April** | 15 | Thursday | Deadline to withdraw from a course without a grade penalty, 5:00 p.m. |
| | 18 | Sunday | Early application deadline for Fall Semester 2021 |
| | 25 | Sunday | Advising and early registration for Summer Term 2021 and Fall Semester 2021 begin |
| **May** | 10–16 | Monday–Sunday | No classes (university closed): Eid Al Fitr holiday* |
| | 17 | Monday | Deadline to submit Summer Permission to Take Courses Outside AUS forms |
| | 20 | Thursday | Admissions application deadline for Summer Term 2021 |
| | 23 | Sunday | Last day of classes |
| | 24–2 | Monday–Wednesday | Study and examination period |
| **June** | 3 | Thursday | Make-up examination day |
| | 12 | Saturday | Spring Semester 2021 Commencement** |
| **Summer Term 2021** | | | |
| **June** | 9–10 | Wednesday–Thursday | Registration for Summer Term 2021 |
| | 13 | Sunday | First day of classes<br>Late registration and add/drop period begin |
| | 15 | Tuesday | Late registration and add/drop period end, 3:00 p.m. |
| **July** | 5 | Monday | Deadline to withdraw from a course without a grade penalty, 3:00 p.m. |
| | 15 | Thursday | Last day of classes<br>Admissions application deadline for Fall Semester 2021 |
| | 18–22 | Sunday–Thursday | No classes (university closed): Eid Al Adha holiday* |
| | 25–26 | Sunday–Monday | Examination period |
| | 27 | Thursday | Make-up examination day |

*Islamic holidays are determined after sighting the moon and actual dates may not coincide with the dates in this calendar.
**Commencement dates are tentative and are subject to change.
**Note**: Loss of teaching days may result in make-up days.

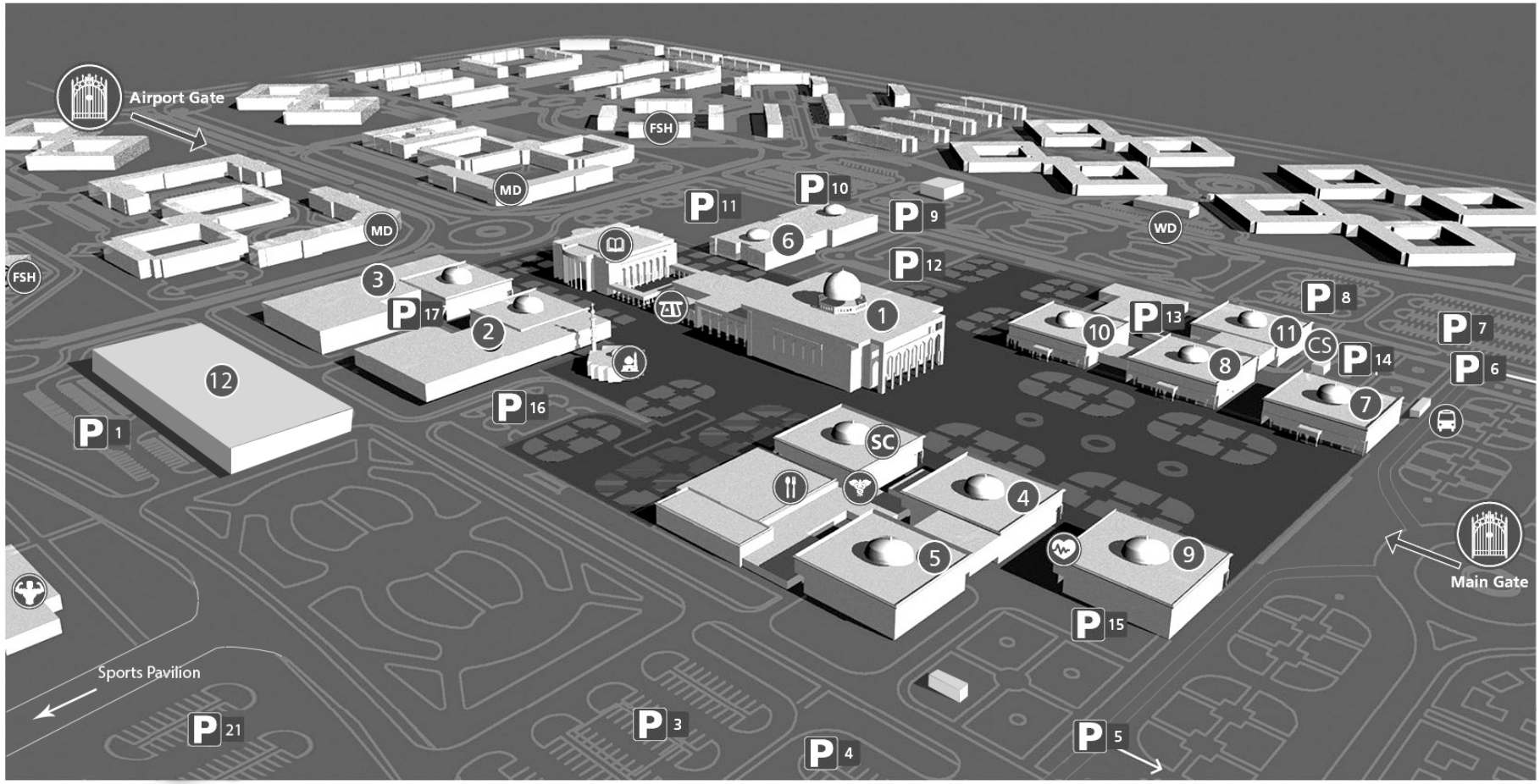
# Directory

UAE Code 971, Sharjah Code 6 www.aus.edu/contact

For General Information: 06 558 5555/06 515 5555 info@aus.edu

| Department | Telephone | Fax | Email |
|---|---|---|---|
| Academic Support Center | 515 2180 | 515 2097 | asc@aus.edu |
| Achievement Academy/Bridge Program | 515 2653 | 515 2638 | academy@aus.edu |
| Admissions/Enrollment Management | 800ASKAUS | -- | https://infodesk.aus.edu |
| Advancement and Alumni Affairs | 515 2022 | 515 2065 | oaaa@aus.edu |
| Career Services | 515 2063 | 515 2065 | careerservices@aus.edu |
| Chancellor | 515 2205 | 558 5858 | chancellor@aus.edu |
| College of Architecture, Art and Design | 515 2825 | 515 2800 | deancaad@aus.edu |
| College of Arts and Sciences | 515 2412 | 558 2759 | deancas@aus.edu |
| College of Engineering | 515 2948 | 515 2979 | deancen@aus.edu |
| Corporate Relations | 515 2016 | 515 2065 | oaaa@aus.edu |
| Executive Education | 515 4405/4721 | -- | discoverexeced@aus.edu |
| Finance | 515 2185 | 515 2190 | finance@aus.edu |
| First Year Experience | 515 2428 | 515 2097 | fye@aus.edu |
| Graduate Studies | 515 2934 | -- | ogs@aus.edu |
| Grants and Scholarships | 515 2005/55/60/72 | 515 4050 | scholarship@aus.edu |
| Health Center | 515 2760 | 515 2675 | healthservices@aus.edu |
| Human Resources | 515 2228 | 515 2139 | humanresources@aus.edu |
| Information Technology | 515 2121 | -- | itservicedesk@aus.edu |
| Institutional Research and Analysis | 515 2206 | 558 5858 | oira@aus.edu |
| International Exchange Office | 515 4018/27/29 | 515 4010 | ixo@aus.edu |
| Library | 515 2252 | -- | auslibrary@aus.edu |
| Office of the Chief Operating Officer | 515 2192 | -- | coooffice@aus.edu |
| Office of the Chief Research Officer | 515 4472 | 515 4025 | ocro@aus.edu |
| Protocol and Security | 515 2296 | 515 2200 | aus_security@aus.edu |
| Provost and Chief Academic Officer | 515 2020 | -- | provost@aus.edu |
| Registrar | 515 2031 | -- | registration@aus.edu |
| School of Business Administration | 515 2310 | 515 4065 | deanofsba@aus.edu |
| Sponsorship Liaison Services | 800ASKAUS<br>515 1111 | -- | https://infodesk.aus.edu<br>sponsors@aus.edu |
| Strategic Communications and Marketing | 515 2212 | 515 2288 | communications@aus.edu |
| Student Accounts | 515 2039/2233 | 515 2190 | studentaccounts@aus.edu |
| Student Affairs | 515 2166 | -- | studentaffairs@aus.edu |
| Student Engagement and Leadership | 515 2773 | -- | seld@aus.edu |
| Student Residential Life | 515 2244 | -- | res-halls@aus.edu |
| Testing Center | 800ASKAUS<br>515 1111 | -- | https://infodesk.aus.edu<br>testingcenter@aus.edu |
| Undergraduate Affairs and Instruction | 515 2281 | 515 2050 | vpua@aus.edu |
| University Counseling Services | 515 2100 | -- | ucsappointments@aus.edu |
| Visa and Equalization Services | 515 2117/2240 | -- | ves@aus.edu |

| Emergency Numbers | |
|---|---|
| Maintenance Emergency | 515 2100 |
| Medical Hotline (24 hours) | 050 635 7651 / 515 4911 |
| Safety and Crisis Management (24 hours) | 515 2068 |
| Security (24 hours) | 050 626 7818 |




| | |
|---|---|
| 1 | Main Building Auditorium |
| 2 | College of Engineering 1 |
| 3 | College of Engineering 2 |
| 4 | Architecture, Art and Design 1 |
| 5 | Architecture, Art and Design 2 |
| 6 | Business and Management |
| 7 | Arts and Sciences: Physics |
| 8 | Arts and Sciences: Chemistry |
| 9 | Language Building |
| 10 | Arts Building |

| | |
|---|---|
| 11 | New Academic Building |
| 12 | Engineering Sciences Building |
| P16 | Visitor Parking |
| P5 - P6 | Free Parking |
| P1 to P4<br>P7 to P15<br>P17 | Reserved Parking |
| | Library |
| | Food Court |
| | Mosque |
| | Sport Complex |

| | |
|---|---|
| | Pharmacy |
| | Health Center |
| | Bank |
| FSH | Faculty/Staff Housing |
| WD | Women's Dorm |
| MD | Men's Dorm |
| SC | Student Center |
| CS | Chemical Store |
| | Bus Stop |

The graduation requirements for any individual student are normally determined by the catalog that was effective when the student matriculated in the major. A student may choose to follow the catalog effective for any semester/term in which they were a registered student in their current program of study. A student who changes majors may petition to revert to the catalog in effect at the time of matriculation into the university. The policies, procedures and academic regulations published in the American University of Sharjah catalog are effective at the time of publication but may be subject to change. Students are responsible for adherence to the most up-to-date policies, procedures and academic regulations.

# Table of Contents

# The University

## Historical Preamble

American University of Sharjah (AUS) was founded in 1997 by His Highness Sheikh Dr. Sultan bin Muhammad Al Qasimi, Member of the Supreme Council of the United Arab Emirates and Ruler of Sharjah. Sheikh Sultan articulated his vision of a distinctive institution against the backdrop of Islamic history and in the context of the aspirations and needs of contemporary society in the UAE and the Gulf region.

AUS was mandated to:

- reinforce the efforts of the leaders of the UAE "to ensure that science and education regain their rightful place in the building and advancement of our society and shaping the lives of our children"
- join other institutions of higher education in seeking "to reshape fundamentally the minds of our youth to enable them to address the challenges of life using the scientific method"
- become a "center of research for educational development and the solution of social problems"
- become "organically linked" to the economic, cultural, scientific and industrial sectors of society in "productive cooperation"
- exercise the "independence and objectivity in teaching and research" necessary for the achievement of these goals

## Vision Statement

American University of Sharjah (AUS) aspires to be globally recognized for outstanding and innovative teaching, learning, research and creative work that have a positive and distinctive impact on the region and beyond.

## Mission Statement

American University of Sharjah (AUS) is a comprehensive, independent, non-profit, coeducational institution of higher education that promotes excellence in teaching, learning, research and creative work.

Based on an American model of higher education, integrating liberal arts and professional programs, and grounded in the context of UAE culture, AUS prepares engaged and effective members of society who display mastery in their areas of specialization, communicate clearly, think critically and solve problems creatively.

AUS fosters a community that celebrates diversity, and whose members are committed to the ideals of open intellectual inquiry, ethical behavior and civic responsibility.

## Institutional Goals

The university is currently guided by the goals outlined in the AUS Strategic Plan 2020–2025 (available at www.aus.edu/about/aus-strategic-plan-2020-2025).

## Overview

American University of Sharjah is an independent, not-for-profit, coeducational institution. Although consciously based upon American institutions of higher education, AUS is expected also to be thoroughly grounded in Arab culture and to be part of a larger process of the revitalization of intellectual life in the Middle East.

AUS has succeeded in building a multicultural education environment that brings together people from diverse nations and backgrounds. AUS strives to instill in its students the importance of appreciating and understanding diversity, global issues and their own roles in society.

AUS is a leading comprehensive coeducational university in the Gulf, serving students from the Gulf region and around the world. AUS students are introduced to a culture of high aspiration and achievement to aid them in leading productive and meaningful lives. AUS is also dedicated to the preservation of the physical environment, free from pollution and neglect. This sense of environmental responsibility is passed on to AUS graduates in order to create ecologically aware citizens.

In keeping with its mission, AUS offers students an education that will enable them to comprehend the dynamism and complexity of contemporary global processes. Through the integration of liberal studies and professional education, students are given both breadth of knowledge and specialization in their chosen fields. Education at AUS runs the gamut from art, poetry and religions from past civilizations to the latest skills and technologies of today's information age. These are all presented to students in order to produce future leaders with a firm understanding of how society has reached its present state. The combination of traditional and innovative teaching methods provides an educational environment in which students can realize their individual potential and pursue their goals.

Through the College of Architecture, Art and Design, the College of Arts and Sciences, the College of Engineering, and the School of Business Administration, the university offers 28 majors and 45 minors at the undergraduate level, 16 master's degree programs and two doctoral degree programs.

While Arabic is the official language of the United Arab Emirates, the language of instruction at AUS is English. All classes and administrative functions are conducted in English.

Islam is the official religion of the state, and Arab Islamic culture predominates in the UAE. The nation is also distinguished by its tolerance toward its large expatriate communities, which comprise diverse nationalities, cultures and religious beliefs. Following in this spirit of understanding and acceptance of all peoples, AUS admits students solely on the basis of their academic qualifications regardless of race, color, gender, religion, disabilities, age or national origin. The university's mission is to create a multicultural, international academic community in order to prepare its students to become lifelong learners equipped to adapt to the needs of our changing world.

AUS was established as an "American" university not only in its formal academic and organizational characteristics but also in the recognition that the total culture and philosophy of the educational community is as significant as the formal program of studies. Students learn the lessons of the classroom and the lessons of life in a coeducational, multicultural and multinational environment.

## Accreditation and Licensure

AUS, located in the Emirate of Sharjah, is officially licensed from June 19, 1999 to February 25, 2025 by the Ministry of Education of the United Arab Emirates to award degrees/qualifications in higher education.

Degree programs offered by AUS are accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates.

AUS has been accredited in the United States of America by the Middle States Commission on Higher Education (3624 Market Street, Philadelphia, PA 19104, USA, Tel +1 215 662 5606) since June 2004.

The bachelor of science degree programs in chemical engineering, civil

engineering, computer engineering, electrical engineering, industrial engineering and mechanical engineering offered by the College of Engineering are accredited by Engineering Accreditation Commission of ABET, http://www.abet.org/.

The bachelor of science degree program in computer science offered by the College of Engineering is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org/.

The School of Business Administration is accredited by the Association to Advance Collegiate Schools of Business (AACSB International), ww.aacsb.edu.

The Bachelor of Architecture program of the College of Architecture, Art and Design is accredited by the National Architectural Accrediting Board (NAAB) of the United States, www.naab.org.

# Campus Life

## The Campus Complex

American University of Sharjah is situated in University City, which is located 16 kilometers (10 miles) from the center of Sharjah. The distinctive architecture of the domes and arches of the academic and administrative buildings is accentuated with graceful Arab motifs.

The center of the AUS campus comprises 13 academic buildings. These buildings house classrooms and lecture halls of various sizes; a state-of-the-art library; laboratories, workshops and studios; and offices for faculty, academic administrators and support staff.

The campus includes student residential halls (for men and for women) as well as a large Sports Complex and a Student Center. Approximately 27 percent of the student body lives in campus housing. Unlike most American universities, AUS requires faculty members and their families to live on campus. Thus, there is a large and continuous faculty presence at the heart of the campus, providing students with a learning and living environment that allows for ongoing interaction with faculty members and their families.

### The City of Sharjah

The location of the university enhances its mission. Sharjah is situated strategically between the Far East and the West, between Africa and Asia. Straddling the breadth of the UAE, which regularly ranks among the world's safest countries, the emirate of Sharjah has beautiful beaches on the shores of both the Arabian Gulf and the Gulf of Oman. Its landscape varies from level plains to rolling sand dunes and mountain ranges.

Today, as in ancient times, Sharjah is a global trade center. Modern Sharjah is also a city of learning and the arts, ranking among the Top 60 Best Student Cities (QS, 2019). Due to its distinctive contributions to Islamic and human culture, Sharjah was selected as the Islamic Culture Capital of the Arab Region for 2014 by the Islamic Organization for Education, Science and Culture. In recognition of its contributions to intercultural dialogue through books and reading, Sharjah was named the 2019 UNESCO World Book Capital. This context facilitates the university's intention to be an academic center at the intersection of ancient cultural traditions and contemporary intellectual currents. Sharjah boasts nearly 30 museums with splendid collections of artifacts and art objects as well as exhibits on science and natural history. These institutions are sites for field trips, research and possible internships. Sharjah hosts many cultural festivals, programs, educational conferences, fairs and economic expositions, including the annual book fair and the Sharjah International Biennial art exhibition. These resources permit AUS to broaden students' formal education in a way not possible elsewhere in the region.

### Campus Services

Miscellaneous service outlets are available on campus to cater for the needs of faculty members, staff members, students and campus residents. These include services such as banking, dining, transportation, laundry, minimarts, a full-service post office and copy center, a bookstore, a travel office, a hairdresser, a barbershop and a pharmacy.

Parking facilities, free and paid, are provided for faculty, staff, students, residents and visitors. AUS reserves the right to restrict or prohibit access to the campus.

The Office of Protocol and Security is responsible for campus security, as well as serving as the university's contact with federal and local government entities, embassies and consulates. The office also provides services such as AUS ID cards, parking stickers, lost and found, assistance with car registration, assistance with procedures related to traffic violations and on-campus accidents, vehicle assistance and official letters required by the federal and local government entities. The Office of Protocol and Security is located in the west Mezzanine Floor of the Main Building (offices MM 29/30/31/32/33) and can be reached at 06 515 2296/515 2074/2075 or at aus_security@aus.edu.

Campus public and occupational health and safety are monitored by AUS Safety and Crisis Management. Safety and Crisis Management provides information on public and occupational health and safety; it also monitors, controls and strives to eliminate health and safety hazards on campus. Safety and Crisis Management is located in the Campus Service Center (office 1022) and can be reached at 06 515 2068.

Immigration-related services are offered for faculty, staff and students, including passport custody, medical test assistance, and the processing of visas and residence permits. For specific details, contact Visa and Equalization Services at ves@aus.edu.

Detailed information on campus services is available in the Life at AUS section of the AUS website and in the *Student Handbook*, available at www.aus.edu/student-handbook.

## Facilities and Resources

### Advancement and Alumni Affairs

The Office of Advancement and Alumni Affairs (OAAA) fosters relationships between AUS and its alumni by providing opportunities for mutual involvement that contribute to the missions and interests of both. Since many of the alumni are situated within the neighboring community, OAAA also seeks to publicize the university's programs, goals and achievements to the off-campus community, including alumni, parents and other constituencies of the university.

OAAA promotes a spirit of unity and of possible collaboration among current and former students on current as well as future projects. The alumni are valuable assets, and they are provided ways to aid in the further development of the university by drawing on their knowledge, skills, financial resources and their sense of deep loyalty to their alma mater.

OAAA enhances the financial wellbeing of AUS by raising contributions for the AUS Endowment Fund and establishing fruitful contacts and mutual collaborations with the wider community, which in turn enhances the visibility of AUS and its stature in the UAE and beyond.

OAAA also offers students and alumni comprehensive career services. It works closely with industry in the UAE and the region to promote interaction between potential employers and AUS students and alumni. It organizes corporate briefings, the AUS Careers Forum, the annual Alumni Reunion and the annual Career Fair, and provides information on job opportunities, internships and summer employment. OAAA has a career resource library and an up-to-date database of AUS alumni and employers in the UAE and Middle East.

For more information about OAAA, please visit www.aus.edu/oaaa or contact the office at oaaa@aus.edu.

### Architecture, Art and Design Facilities

College of Architecture, Art and Design (CAAD) students benefit from open studios and robust, state-of-the-art facilities. Students accepted into the second-year studio majors have

dedicated individual worktables and computer workstations with network connections. Additional spaces, which are shared by all curricula, include exhibition galleries, a lecture hall, seminar rooms, a media wall, digital classrooms, high-end computing labs and comprehensive printing facilities. CAAD students and faculty also enjoy access to a variety of labs, which are among the most advanced facilities found in universities internationally. CAAD labs cover a wide spectrum of making, both analog and digital, including conventional material fabrication as well as advanced digital technology. The labs are grouped into three categories: Digital Fabrication, Material Fabrication and Media Labs. Digital Fabrication Labs include CNC routers, industrial robotic arms, thermoforming, laser cutting machines and a number of 3D printers. Material Fabrication Labs include a comprehensive woodshop and metalshop, and ceramics studio. The Media Labs contain production spaces, editing suites, photography and printmaking studios, as well as a media equipment center.

## AUS Sustainability

AUS understands sustainable resource management is vital to a healthy future and is working to ensure AUS is a sustainability leader in the region.

AUS Sustainability connects across disciplines and departments to provide opportunities for students and faculty to incorporate sustainability into the classroom and address sustainability issues collectively. It envisions the campus as a living lab for new ideas and solutions that address environmental and social issues at AUS and beyond.

AUS Sustainability engages with students to participate in campus campaigns and activities and model a sustainability mindset in their future decision making.

The student EcoRep program plays a key part in AUS achieving a sustainable campus. Student EcoReps act as an important communication channel between the student body and the AUS sustainability team, helping to promote sustainability issues to their peers and raise awareness.

For more information on AUS Sustainability please visit www.aus.edu/sustainability or contact sustainability@aus.edu.

## Common Research Facility

The Common Research Facility (CRF) at American University of Sharjah is an organized shared resource that provides access to technologies, equipment (including, but not limited to, instruments, databases, software), services and expert consultation, often on a fee-based or reimbursement basis, to enable, facilitate or enhance the educational, research and scholarship mission of the university.

The objectives of the CRF are:

- to provide training and basic analytical research support for faculty and students at AUS
- to house and operate multi-user large instruments that require special infrastructure, operational supervision and maintenance
- promote research projects that transcend normal disciplinary boundaries and encourage active collaboration between faculty at AUS and beyond
- to improve faculty's productivity of research and scholarly/creative works and ensure fairness and transparency of access to the CRF resources.

## Computer Learning Resources

Information Technology (IT) serves the computer-related administrative, instructional, technical and research needs of students, faculty and staff. It also acts as the university's gateway to the Internet for academic and administrative purposes. Services provided include email, learning management system (Blackboard), online collaboration tools, mobile applications, wire/wireless network connections, audio/video conferencing, network storage, telephony, printing services and much more.

All classrooms are networked and equipped with data projectors and other technology that enable faculty members and students to enhance learning with digital and online content. Wireless network access is available in all dormitories and academic areas of the campus.

AUS departments and programs offer a range of specialized and general computer laboratories with software to support student work. Many of these software products are also remotely accessible to students using their own personal devices. Additionally, the library features an information commons with an expanded range of computers, software and related technology along with support for students' research and other academic work.

The university's computer network uses fiber-optic cables that interconnect the entire campus, including the residential halls and faculty housing. Additional information can be found in the IT section of the university website.

## Executive Education

AUS provides educational opportunities to lifelong learners who want to refresh their skills and knowledge, display mastery in core competencies of their areas of specialization, stay ahead of their competition, and communicate clearly, think critically and solve problems creatively. Through its executive education programs, AUS offers individuals and organizations access to the knowledge and expertise of its faculty. Drawing on the resources and facilities of university, AUS executive education programs offer a wide range of non-credit professional certificates and mini-MBAs for executives in addition to custom programs. Executive education at AUS is an essential and continuously expanding activity, connecting academia and industry. The Jafar family has shown in many instances their support to the function of executive education at AUS, as demonstrated with the establishment of the Jafar Center for Executive Education in 2011 (see Jafar Center for Executive Education later in this section). Visit execed.aus.edu or email discoverexeced@aus.edu for more information.

## Interactive Trading Floor

The Interactive Trading Floor (ITF) at American University of Sharjah is a technologically advanced 22-seat learning space designed to be the exact duplicate of the trading floor found in typical Wall Street or global investment firms, including the same live feeds, and company- and industry analysis supporting data such as Capital IQ, Thomson Reuters and state-of-the-art Bloomberg terminals.

The ITF allows students to apply analytical models and trading techniques to real time market data, thereby extending theory into practice. Assignments integrating live data, trading simulations, analytical assignments and practical cases as well as trading competitions are used to promote interactive learning and facilitate a profound understanding of the intricacies of financial markets.

## Jafar Center for Executive Education

Located in the School of Business Administration, the Jafar Center for Executive Education (JCEE) provides a state-of-the-art facility with equipment and furnishings to support a variety of learning formats, including team activities, video conferences, lectures and seminars. The mission of JCEE is to facilitate interaction between AUS faculty and the business community for the purpose of developing the

leadership capacity of enterprises in the UAE and the wider region. Faculty interaction with business leaders also allows professors to take the needs of business and government back into the classroom with graduate and undergraduate students.

## Laboratories

**Engineering and Computing Laboratories**

The College of Engineering has 53 laboratories and workshops. All equipment and instruments are accessible to and extensively used by students. Laboratory focus areas are presented below and may be reviewed in detail on the college's website.

Chemical engineering laboratories focus on unit operations and process control, corrosion, environmental, petroleum, refining, water, materials, thermodynamics, fluid flow, heat transfer, process computer simulation and drug delivery.

Civil engineering laboratories contain equipment and facilities to support teaching and research in structural, geotechnical, geological, water resources and environmental engineering and construction materials.

Computer science and computer engineering laboratories relate to programming, digital systems, microprocessors, very large scale integration (VLSI), embedded systems, industrial computer applications, computer networks, software engineering, operating systems, databases, high-performance computing, Internet of Things (IoT) programming, machine and deep learning, virtual and augmented reality, and mobile and Internet computing.

Electrical engineering laboratories focus on electronics, electric power, control, measurements, machines, communications and signal processing, antennas and microwave, and medical electronics. The Department of Electrical Engineering also has a class 10,000 clean room facility for testing microelectronic chips as well as an advanced EDA lab.

Industrial engineering laboratories contain the latest software in optimization, simulation, layout design, CAD and NC programming. The Department of Industrial Engineering also shares the materials testing, conventional and advanced manufacturing laboratories with the Department of Mechanical Engineering.

Mechanical engineering has laboratories for advanced manufacturing, aeronautics, computer-aided engineering, control systems, dynamics and mechanical vibrations, engineering measurements, fluid mechanics, heat transfer, internal combustion engines, materials testing, mechatronics, refrigeration and air-conditioning, thermodynamics and renewable energy.

The various departments share eight computer labs with 274 stations. All labs have dedicated lab instructors and engineers. Additionally, all engineering facilities offer wireless connectivity.

**Interpreting and Translation Laboratory**

The Department of Arabic and Translation Studies has a purpose-built interpreting facility. It features simultaneous interpreting booths, a consecutive interpreting table, Internet access and equipment for simulated video teleconferencing. The department also uses other computer labs, which are equipped with machine translation software, TRADOS and other relevant software, including Internet-based, needed in language engineering as well as subtitling.

**Mass Communication Studio and Creative Laboratories**

Students in the Department of Mass Communication benefit from an audio-visual studio in news presentations, talk shows and dramatic works. Students also benefit from high-tech digital classroom laboratories with Mac workstations featuring industry-standard graphic design, desktop publishing, video effects, video editing and multimedia software.

**Science Laboratories**

The science programs benefit from up-to-date laboratories and equipment that provide a rich general and research laboratory experience for AUS students.

The biology laboratories are equipped with the latest light and phase compound microscopes, including a workstation with image analysis capabilities; a laminar flow sterile hood; electrophoresis equipment; cryostat and microtome units; bone densitometer; a freeze drier; growth chambers and incubators; a gel documentation system; a UV trans-illuminator; refrigerated microcentrifuges; a trans-blot semi-dry transfer apparatus; a gel dryer; a $CO_2$ cell incubator; a -80 °C freezer; a tissue homogenizer; and a thermocycler for DNA amplification.

The environmental sciences and chemistry laboratories are equipped with the latest sampling and analytical instrumentation including AA, GC-MS, FTIR, TOC, uHPLC, ICP-MS, a 400 MHz Bruker Biospin NMR, various spectrophotometers, a rapid kinetic apparatus and physisorption apparatus.

The physics laboratories are supplied with up-to-date standard equipment, including computer interfaces, motion sensors, current sensors, voltage sensors, magnetic field sensors, linear air tracks, photogates, smart timers, projectile launchers, ballistic pendulums, rotational systems, digitometer, electric field mappers, current balance apparatus, signal/function generators, oscilloscopes, a Hall effect apparatus, lasers, spectral lamps, photoelectric effect apparatus, Geiger-Muller tubes, radiation counters, h/e apparatus, Frank Hertz apparatus, e/m apparatus, spectrometers, interferometers, X-ray machines, a Millikan oil drop apparatus, heat engines/gas law apparatus, a thermal expansion apparatus and an adiabatic gas law apparatus.

## Library

The AUS Library, an 11,000-square-meter state-of-the-art facility, provides collections, services and programs to support the curricular and research needs of the university community. The majority of the library's growing physical collection of more than 161,000 items is in English. There are also more than 5,000 items available in Arabic. An online library management system can be used to search for library materials from any location on or off campus. Using the library website, students and faculty can access e-books, online databases, full-text journals and other digital resources. Library facilities include the Information Commons, group study rooms, quiet study areas and media viewing rooms. The library offers hands-on information literacy classes to teach students research skills, and qualified librarians are available via email or for individual consultations. The library works in conjunction with all parts of the university to provide academic resources for all classes taught at AUS. The library's website is available at http://library.aus.edu.

## Office of Strategic Communications and Marketing

The Office of Strategic Communications and Marketing is responsible for developing, overseeing and implementing a comprehensive marketing and communication strategy that strengthens AUS's reputation and positioning both nationally and internationally. Aligned with the university's vision, mission and strategic directions, the office is responsible for achieving AUS's short- and long-term marketing objectives by successfully targeting and communicating with key stakeholders and core constituencies. The office works closely with the institution's leadership to advance AUS's local,

regional and international positioning aspirations by actively supporting all aspects of its institutional advancement agenda; efficiently manage its media, print and electronic communication tools to engage and inform internal and external stakeholders; and ensuring campus-wide communications processes.

## Research and Grants

AUS supports and promotes research, creative and scholarly work, in addition to private consulting activities of its faculty members. AUS offers both its undergraduate and graduate students' opportunities to work on faculty research projects, to present papers with faculty at international conferences, and to assist faculty in developing their own research grants.

All internal or external research activity conducted at AUS is subject to the Policy on Research Administration, Research and Scholarly Misconduct, and Protection of Human Subjects, in addition to a multitude of financial compliance policies and procedures. Students' creative intellectual property is governed by the policy on Protection of US Students' Creative Intellectual Property. All relevant research policies and procedures are available on ilearn.aus.edu/Community/Office of Research/AUS Policies.

AUS upholds its ethical responsibility to administratively review all proposed research projects involving human and animal subjects. All research studies at AUS involving the participation of humans must be submitted to and approved by the AUS Institutional Review Board (IRB) before any study is undertaken. All studies involving animal subjects undergo protocol evaluation by the Institutional Animal Care and Use Committee (IACUC) before any study is undertaken.

For further information on the university's research and grant opportunities, please visit the AUS website or email research@aus.edu.

## Research Centers

AUS has established a number of research centers as part of its commitment to research and community outreach.

**Earthquake Observatory**

The AUS Earthquake Observatory uses state-of-the art equipment and software to analyze the region's earthquake activity. The Earthquake Observatory also provides expertise on earthquake hazards and related risk in the UAE and the Gulf region; assessment of seismic hazards at construction sites and petrochemical and industrial facilities; assessment of seismic risk of existing structures and recommendations for strengthening and retrofitting; evaluation of local site effects; preparation of macrohazard and microhazard zonation maps; evaluation of dynamic soil properties in laboratory and field; and noise and vibration analysis.

The Earthquake Observatory provides training for engineers on seismic hazard and site response analysis, liquefaction analysis, geophysical techniques, structural analysis and design for earthquake loading, geotechnical analysis and design of foundations for earthquake loading, and the development of earthquake-resistant design codes.

**Institute of Urban and Regional Planning and Design**

The Institute of Urban and Regional Planning and Design advances urban planning as it relates to the local culture and identity of the UAE and the Arab Gulf region, and promotes sustainability as integral to all activities pertinent to urban planning and urban design. The institute's objectives are to advance production and accumulation of knowledge in urban and regional planning and urban design; develop and offer educational and training opportunities in urban and regional planning and urban design; collaborate with local governmental, not-for-profit, non-governmental and private agencies concerned with urban planning and development to advance quality of practice and research; advance public discourse on urban planning through public forums (e.g., seminars, conferences, symposia); and increase public awareness in urban planning and urban design.

**Mechatronics Research Lab**

The Mechatronics Research Lab leads research and development in advanced engineering systems to address high-tech technology transfer in the region. It promotes multidisciplinary research activities between faculty members and graduate students at AUS, and industry and governmental agencies that require extensive integration of instrumentation, control systems, electronics, intelligent software and computers. The Mechatronics Research Lab offers excellent networking opportunity with leading industries in the region as well as top academic institutions worldwide. Areas of expertise within the research lab include embedded and distributed process control, remote monitoring, nonlinear and intelligent control systems, robotics, autonomous systems and unmanned vehicles.

## Testing Center

The AUS Testing Center serves as a central point of testing for both the AUS campus and the community.

The center administers placement tests for newly admitted AUS students and facilitates general university testing. The center also offers internationally recognized tests and vocational tests. In addition, it offers proctoring services for external tests, such as distance-learning examinations.

The Testing Center has professional, trained proctors certified by ETS and Pearson VUE®. It is an authorized TOEFL iBT Test Center and a Pearson VUE® authorized Test Center (PVTC Select). AUS' main testing partners are ETS, AMIDEAST and the British Council.

Tests offered by the center include the Institutional paper-based TOEFL (ITP), Internet-based TOEFL (iBT), paper-based IELTS, computer-delivered IELTS, SAT, TWE, TOEIC, Fundamentals of Engineering Exam (FE), Principles and Practice of Engineering Exam (PE), Graduate Management Admission Test (GMAT) and CISCO exams.

For more information, visit www.aus.edu/testing-center.

## University Health Services

University Health Services (UHS) provides primary health care services to all AUS students, faculty, staff members and their dependents. UHS is open Sunday–Thursday from 8:30 a.m. to 4:30 p.m. and also provides 24-hour emergency care. Depending on the severity of the illness, patients are referred to a hospital for further treatment if required. Great emphasis is placed on making the campus a healthy and safe place to study, work and live by providing preliminary physical examinations to all students and employees as a mandatory part of the registration/employment process, followed by continued quality care throughout their time at AUS, including sport team fitness checks.

UHS is a Ministry of Health licensed facility and is staffed with a qualified licensed medical team, which includes general practitioners and registered nurses. On-site counseling services are also available (refer to University Counseling Services at the end of this section).

UHS is equipped with an observation room (day care) to closely monitor patients for short stays before transferring to a hospital if required. UHS has access to an on-campus laboratory and pharmacy to assist in serving the AUS community. An ambulance is on standby 24 hours a day within University City.

**Health Education Programs**

As part of an educational institution, UHS plays an active role in educating the university community and promotes on-campus health and wellness activities throughout the academic year. UHS programs include awareness campaigns on health-related issues such as first-aid training and CPR courses.

**Health Insurance Plans for Students**

As part of the registration procedures, every undergraduate student must enroll in one of two health insurance plans (Plan I and Plan II) by visiting University Health Services and completing the necessary paperwork.

Plan I is compulsory for AUS-sponsored (visa sponsored by AUS) undergraduate students but optional for those who are covered by private insurance (proof of coverage must be submitted to UHS). Plan I students must submit the required health insurance registration documents (for a list of these documents, see www.aus.edu/healthcenter) by the semester registration deadline to avoid incurring government fines at the time of UAE residence visa renewal. UHS will not be liable for any such fines. Students who fail to submit the health insurance registration documents by the deadline will be placed on Plan II.

Plan II is compulsory for all undergraduate students who are not enrolled in Plan I.

For more information on the health insurance plans, visit www.aus.edu/healthcenter.

### University Sports Facilities

Student Athletics and Recreation manages the sports facilities, including the Sports Complex and the Sports Pavilion. The Sports Complex consists of indoor facilities such as basketball, tennis, squash and volleyball courts; multipurpose halls; a 50-meter swimming pool; saunas; fitness centers with free weights and exercise machines; an aerobics hall and a multipurpose hall for table tennis/martial arts. Outdoor sports facilities include the Sports Pavilion, a 400-meter running track, a soccer field, a cricket ground, a cricket practice net and a baseball field.

The AUS Sports Facilities are to benefit the entire AUS community. Students, staff, faculty members and their dependents enjoy free usage of these facilities.

Details on the AUS sports facilities are available in the *Student Handbook* and at www.aus.edu/osa/athletics.

Interested AUS community members can also visit the Sports Complex reception or call 515 2778.

## Student Life on Campus

### Student Code of Conduct

American University of Sharjah is a community of individuals living, working and studying together in order to create the ideal conditions for learning. Mutual respect and responsibility are imperative if each individual is to flourish and grow in this environment.

In order for the purpose of the university and its community to be realized, the rights, responsibilities and reasonable standards of conduct essential to a university community must be delineated. The principles, rules and regulations of the university constitute the basic standards and guidelines for conduct on and off campus. The Office of Student Affairs (OSA) establishes and enforces those rules and regulations. The full text of the Student Code of Conduct is provided in the *Student Handbook* and at www.aus.edu/student-handbook.

As part of OSA, Student Conduct and Conflict Resolution is responsible for educating students about their rights and responsibilities, creating awareness within the AUS community about the Student Code of Conduct, and implementing the code in a fair and consistent manner. Allegations of misconduct under the Student Code of Conduct are resolved by Student Conduct and Conflict Resolution in a manner consistent with the core values of fairness, honesty and integrity. Student Conduct and Conflict Resolution also offers mediation services, which assist students in resolving conflicts through mediation. Students are trained in mediation and awarded a certificate on successful completion of mediation training and mock sessions. Student Conduct and Conflict Resolution is located on the first floor of the Student Center in offices A254–256 and 233.

For more information, please refer to the *Student Handbook* or visit www.aus.edu/osa/studentconduct.

### Community Service and Outreach

AUS Community Service and Outreach (CSO) links students with civic engagement and service opportunities thorough community partners. CSO allows students to experience first-hand the value of serving others through charity, awareness and outreach programs. Throughout the year, CSO organizes a number of events and initiatives that promote a variety of volunteer programs that encourage and empower students who are driven by social impact. Current volunteer programs are listed in the Student Life section of the university website (www.aus.edu/life-at-aus/student-life/community-involvement/volunteer-communities) and in the *Student Handbook*.

Students who are interested to learn more about volunteer opportunities can visit Community Service and Outreach in the Student Center (office A222), call 515 2794 or email osacom-services@aus.edu.

### Cultural Events

Theatre performances and musical events, ranging from classical and regional to jazz and rock, are brought to campus through the Cultural Events Committee. For more information, visit www.aus.edu/events.

The Performing Arts Program also presents a wide array of student productions in theatre, dance and music in the Arts Building rotunda. For more information, visit www.aus.edu/cas/performing-arts-program or email paevents@aus.edu.

### Office of Student Affairs

The mission of the Office of Student Affairs (OSA) is to provide high-quality services and programs facilitating informal learning that is in congruence with the Middle Eastern culture; complements formal learning; and promotes aesthetic, ethical, intellectual, personal, social and talent growth in a safe environment.

The Office of Student Affairs provides a host of out-of-class learning opportunities in extracurricular areas for students to engage and develop the student life experience at AUS. Student Affairs transforms student life with a purpose, engaging students in activities that facilitate their holistic development. Student involvement in OSA-initiated activities enables them to accomplish their personal and educational goals. Students are engaged in diverse programs, activities and events and provided services through Student Athletics and Recreation, Student Engagement and Leadership, Student Clubs and Organizations, Community Services and Outreach, On-Campus Student Employment, Student Leadership Programs, Student Residential Life, and Student Conduct and Conflict Resolution.

More information on Student Affairs is available at www.aus.edu/student-affairs. Students can also visit the Office of the Vice Provost for Student Life (M-217 on the Second Floor of the Main Building), call 06 515 2166 or email studentaffairs@aus.edu.

## On-Campus Student Employment

Opportunities for on-campus employment are available to all AUS students. Students may work no more than 80 hours per month. Students may work for up to 160 hours per month during academic breaks and summer terms only. Hourly rates vary depending on the department and the type of work assigned. In addition to working in the university departments and campus outlets and facilities, students can work voluntarily off campus during exhibitions and important events in the UAE. Further information on all campus employment opportunities is available through the On-Campus Student Employment office in the Student Center (office A224) or at www.aus.edu/on-campus-student-employment.

## Student Athletics and Recreation

The Office of Student Affairs offers students many opportunities to develop their abilities in a variety of sports. Full-time and part-time coaches and trainers in Student Athletics and Recreation help develop student's fundamental skills in athleticism, strength and conditioning, and overall sportspersonship, as well as support and encourage students to adopt a disciplined and healthier approach to sports. AUS offers a variety of individual and group fitness classes, general leisure activities and a broad-base of competitive and recreational programming. For more information, visit the Sports Complex reception or www.aus.edu/osa/athletics or call 515 2778.

The university's intramural sports program complements students' academic, social and cultural education. Involvement in intramural sports activities reduces stress, promotes team bonding and provides an excellent opportunity for students to socialize.

Student Athletics and Recreation also offers students the opportunity to participate in local, regional and international intercollegiate sports tournaments.

## Student Center

The Student Center plays an important role in the extracurricular life at the university by serving as a central hub for student activities. It is primarily dedicated to serving the cultural, social and recreational interests of the student body as well as to providing students with a comfortable and inviting atmosphere to unwind.

The Student Center is more than just a place for students to socialize and relax; Student Engagement and Leadership's offices are located at the center to provide students with non-academic support services and facilities under one roof. The Student Center provides a wide array of amenities and facilities. These include an information desk, a meeting room, club workstations, TV lounges, a floating theatre and a multipurpose room.

Student Engagement and Leadership manages the Student Center facilities and all events and activities that take place at the center throughout the year. For more information about the Student Center call 06 515 2716.

## Student Clubs and Organizations

Student-sponsored organizations are an integral part of the learning process at AUS. The academic experience is enriched by participation in activities that allow students to pursue their personal interests outside the classroom while providing opportunities for leadership development and for involvement in university life.

Student Engagement and Leadership is the central support for the numerous student organizations on campus. Its role includes supervising and providing assistance with program planning and implementation.

The student organizations at AUS span a wide range of interests and reflect the varied cultural backgrounds of AUS students. Interest-oriented and clubs organize numerous professional and cultural activities throughout the academic year and play a vital role in fostering a rich multicultural environment on campus. For a complete listing of student clubs, visit www.aus.edu/osa/studentorganizations.

Participation in student clubs and organizations is strongly encouraged. Students are also encouraged to form organizations/clubs that promote their interests and hobbies.

For more information, read the Student Clubs and Organizations Manual available at www.aus.edu/student-clubs-and-organizations-manual or visit Student Clubs and Organizations in the Student Center (A244, A246 and A247).

## Student Council

His Highness Sheikh Dr. Sultan bin Muhammad Al Qasimi strongly encouraged AUS students to establish a Student Council in order to ensure student representation on campus.

The AUS Student Council is an elected body that articulates undergraduate students' views and interests in the university. The Student Council is a vehicle for ensuring that undergraduate students can have a voice in formulating university priorities and policies. It also provides a structure for greater student involvement on campus. The Student Council follows its constitution and by-laws in decisions made by members and the council. The constitution and by-laws are written and amended by the Student Council and approved/endorsed by the Vice Provost for Student Life and the Chancellor. The Vice Provost for Student Life advises the Student Council. For information, please see the Student Handbook, visit the Student Council office in the Student Center (office A107) or visit www.aus.edu/student-council.

## Student Engagement and Leadership

Student Engagement and Leadership promotes students' intellectual growth, skills and all-round personality development by engaging them in registered student organizations, volunteer programs, on-campus student employment, and varied events and activities locally, regionally and internationally. Student Engagement and Leadership offers resources and services that aid student participation and development and builds university reputation through student achievements. For more information, please see the *Student Handbook* or visit the Student Engagement and Leadership office in the Student Center (office A252).

## Student Leadership Programs

Student Leadership Programs (SLP) fosters a wide range of opportunities for students to develop their leadership, personal and communication skills, and prepares them for a lifelong commitment to leadership and good citizenship. SLP engages students in local, regional and international conferences and Model United Nations simulations that aid in the development of character, public speaking skills, confidence, mindset and overall leadership capabilities. Students can choose to get involved in programs such as the Peer Leaders Program, Emerging Leaders Program, Women's Leadership and Enrichment Program, and the Youth Leadership Training Program. They can also can participate in the AUS Student Lecture Series and attend workshops under the Student Training and Workshop Series.

For more information, visit office A249 in the Student Center, go to www.aus.edu/leadership-program, email osaslp@aus.edu or call 515 4771.

## Student Residential Life

The main objective of Student Residential Life of OSA is to support and complement the mission of the university and its academic programs by creating a comfortable and safe

environment that contributes to the success of resident students' educational progress and personal growth. The AUS residential halls offer a unique multicultural environment in which students from different parts of the world can learn from one another.

Because residential hall living is seen as a positive educational experience, students are encouraged to live on campus. Living on campus complements the overall learning experience by fostering independence and tolerance of others in students. Furthermore, living on campus allows students to make the most of what AUS has to offer, such as sports and dining facilities, the library and laboratories; it also gives students convenient access to the many activities that take place during the day and in the evening. The university offers a convenient bus service between the residential halls and other areas on campus.

The residential halls for male and female students are completely separate. All hall residents are expected to spend every night in the halls, unless they have written authorization from their parents or guardian indicating otherwise. To ensure the security of all students, the residential halls are protected by security patrols.

Residential halls staff members are available around the clock for the safety and comfort of all residents. Resident Assistants (RAs) in each resident hall foster a sense of community among students living on campus. Each floor of a residence hall has one or more RA. In addition to connecting residential halls students to the residential community, RAs inform students about university resources, help them understand the policies outlined in the *Student Handbook* and introduce them to extracurricular opportunities at AUS.

Regulations for the residential halls are available in the *Student Handbook* and at www.aus.edu/residential-halls.

### Students with Mobility Issues

AUS students who require support due to mobility issues should contact the Office of Student Affairs at studentaffairs@aus.edu. Please also refer to the Academic Support Center section hereafter.

## Student Educational Services

AUS offers a broad range of educational services to support student learning. Details of these services and how to avail them are provided herein. As the university provides authorized support services, external tutors are not permitted on campus.

### Academic Support Center

The Academic Support Center (ASC) helps undergraduate students succeed academically at AUS. Advisors at ASC teach students to take responsibility for their education, set academic goals, graduate in a timely manner and successfully meet all requirements for a quality education at AUS.

ASC works with students who are struggling academically (such as those on academic probation) and provides them with extra support and skills development training required for academic progression. ASC also coordinates academic accommodations for students with documented disabilities recognized by the Americans with Disabilities Act (ADA) that are affecting their academic performance, in compliance with the UAE Federal Law 29 of 2006, to the extent permissible by available resources. For support regarding campus accessibility, please contact the Office of Student Affairs at studentaffairs@aus.edu.

ASC offers a variety of Student Success Workshops that are available to all undergraduate students, as well as peer supports.

For more information, visit www.aus.edu/asc.

### First Year Experience

The First Year Experience (FYE) program seeks to enable first-year students to discover their potential by supporting them through transition, connecting them to available campus resources, and engaging them in a learning experience that empowers intellectual and interpersonal growth. The focus of the FYE is to help first-year students develop an increased awareness of available campus resources, identify strategies for effective time management, demonstrate a deeper understanding of essential study skills for success at AUS, create goals to improve self-care and wellness, and engage in meaningful interactions with the AUS community. For more information, contact fye@aus.edu or 06 515 2180.

### Mathematics Learning Center

The Mathematics Learning Center (MLC), located in the New Academic Building room NAB 239A and the Library building room LIB 118, provide one-on-one tutorial sessions for students enrolled in all remedial and 100-level mathematics courses. The tutors are well-trained senior undergraduate and graduate students. Student may drop in for consultation during the weekly scheduled sessions to seek understanding of certain course-related concepts. Consultation does not cover specific homework, or project-related questions. The MLC also offers review sessions prior to the exams, on need basis. Students can request appointments with the tutors or submit their enquiries by email to cas-mlc@aus.edu.

### Study Abroad

The International Exchange Office (IXO) works with AUS students who wish to study at universities in other countries either for a semester or for one academic year. For information on study abroad opportunities for AUS students, please see the section entitled AUS Students Studying Abroad under Registration and Course Information in the Academic Policies and Regulations section of this catalog.

The office also facilitates the admission of international students coming to AUS to study abroad for a semester or up to one academic year. For more information on study abroad students' admission to AUS, please see the Other Admission Categories section in Admission to Undergraduate Studies later in this catalog. IXO also welcomes, orients and supports international degree-seeking students during their time studying at AUS.

In addition to facilitating student exchanges and study abroad, IXO also administers processes enabling faculty-led study tours, visiting guests-in-residence, visiting guests and delegations, tuition exchange programs, and the dissemination of information regarding international scholarships and internships.

For more information, visit www.aus.edu/ixo.

### University Counseling Services

University Counseling Services (UCS) provides psychological services that are designed to help students achieve their educational goals, learn the process of problem solving and decision making, develop the capacity for satisfying relationships, and learn to make full use of their potential for continued growth beyond their educational experience.

**Counseling**

Counselors at UCS help students explore any academic or personal problems or concerns that they may be experiencing. Some common issues that bring students to UCS include adjusting to university life, time management issues, confusion about life or career goals, identity concerns, relationship conflicts, eating issues, anxiety, depression or dealing with grief and loss.

Our counselors are prepared to deal with a multitude of issues or concerns

and encourage students to identify personal goals and help them develop coping skills and generate solutions for current difficulties. Students may receive help for any social, emotional, educational or vocational issues.

Counseling is strictly confidential. The information shared with a student counselor will not be disclosed to another individual or organization without the written consent of the student. Services are free, voluntary and available to all undergraduate and graduate students currently enrolled at AUS.

Students can schedule appointments by calling 06 515 2100 or by emailing ucsappointments@aus.edu or by stopping at the University Health Services reception.

Further details are available at www.aus.edu/life-at-aus/student-life/student-support-services/counseling-services

**Self-Help Resources**

UCS has extensive self-help resources on many subjects in the form of handouts, books, videos and links on its section of the university library website at https://aus.libguides.com/well-being. Topics include coping with stress, depression, sleep disturbance, loneliness, anxiety, eating disorders, grief and loss, substance abuse, relationship building, assertiveness, career choices, study skills, concentration and memory, motivation, time management, and test-taking strategies.

**Student Workshops**

Workshops are conducted throughout the academic year on topics such as time management, study skills, communication skills, anxiety and stress management, anger management, clinical anxiety and depression, personality assessment and disorders, treatment for posttraumatic stress disorders and trauma therapy, adjusting to university life, personal development, positive psychology, motivational exercises and memory improvement. Workshop topics and dates are advertised around campus, or students can email UCS at ucsappointments@aus.edu to learn about future workshops. Students are encouraged to contact UCS with ideas for future workshops.

## Writing Center

The AUS Writing Center, located on the ground floor of the AUS Library building (room LIB 024), helps students become independent, confident writers. Available to all AUS students, the Writing Center offers one-on-one writing conferences by appointment or on a drop-in basis. Consultations may include thesis development, organization, outlining, paragraph development, vocabulary, sentence structure and mechanics. Students may visit the Writing Center to work on drafts, to do research or to work with a consultant on particular aspects of their writing. The Writing Center also offers workshops on a variety of writing topics throughout the academic year.

For more information, visit www.aus.edu/cas/writing-center.

# Achievement Academy

**Director**

Jessica March

**Instructional Staff**

Diala Awwad
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Claire Murphy
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Krystie Wills

The Achievement Academy is composed of two units: the Bridge Program and the Outreach Program.

The Bridge Program is a comprehensive, multifaceted university preparation program to act as a transition between high school and university studies. It is a holistic, content-based, outcome- and standards-driven English language acquisition and university preparation academic skills program. Students in the Bridge Program are also allowed to register for specific 100-level mathematics or physics courses required for their intended major, provided they have passed the corresponding placement tests. Students who do not meet the placement test requirements may register for the corresponding preparatory courses designed to prepare them for 100-level math and physics courses.

The Outreach Program conducts courses in general English, TOEFL and IELTS (Academic Version) preparation, workplace English and business English on the AUS campus and throughout the UAE. The program establishes partnerships with various community organizations in order to provide educational opportunities for individuals who wish to further develop their English and personal and professional communication skills.

## Bridge Program

### Mission Statement

The Bridge Program in the Achievement Academy at American University of Sharjah will improve student readiness for matriculation into their majors and for the rigors of an academic program of study in higher education. The program works with students to increase their language proficiency to a level suitable for study in courses taught in English; to improve students' analytical, reasoning and problem-solving skills in math and physics (as applicable) to ready them for university math and physics courses; and to enhance students' personal, academic and study skills to maximize the likelihood of success in their university experience.

For information on the Bridge Program, please contact:

Achievement Academy
American University of Sharjah
PO Box 26666
Sharjah, United Arab Emirates
Tel +971 6 515 2653
Fax +971 6 515 2638
academy@aus.edu

### Admission and Placement

Admitted AUS students who have achieved one of the following scores may study in the Bridge Program:

- between 45 and 79 on the Internet-Based TOEFL (iBT) or
- between 450 and 547 on the AUS Institutional Paper-based TOEFL (ITP) or
- between 5.0 and 6.0 on the IELTS (Academic Version) or
- below 1550 on the EmSAT Achieve Test

Students who do not attain the required minimum scores may be considered for the Pre-Bridge English Language Preparation course or for courses in the Outreach Program, depending on their scores, to improve their English level to meet the requirements of the Bridge Program.

Placement in the Bridge Program courses and special Outreach Program courses is strictly determined by TOEFL, IELTS or EmSAT scores.

### Program Structure

The Bridge Program offers two levels of English language study, math, physics and university preparation courses. English courses include integrated instruction in reading, writing, grammar, listening, speaking, and TOEFL and IELTS (Academic Version) training. Math and physics courses prepare students for university-level courses in those subjects. The university preparation courses include topics such as time management, note taking, research methods, public presentations, critical thinking, problem solving, adapting to university life and developing personal skills.

Students study the following per week: English, 15 hours; math (or physics, if required), 3–5 hours; university preparation, 3 hours; and test preparation to provide students with strategies and practice for the TOEFL and IELTS exams, 3 hours. Physics and math may not be taken in the same semester in the Bridge Program.

### Duration

The length of time required to satisfy the program requirements varies with each student's linguistic background, capabilities and effort. Successful completion of the program could take as long as two semesters and one summer session.

### Academic Integrity

Students are expected to complete their own assignments and write their own quizzes and examinations. Students found guilty of academic dishonesty will receive a failing grade on the assignment, quiz or examination, and may be reported to the administration for further disciplinary action. All Bridge Program students should refer to the AUS Student Academic Integrity Code found in the Academic Policies and Regulations section of this catalog.

### Bridge Program Credit Hours

For information on course credits and course credit hours distribution, please refer to the Bridge Program's course descriptions hereafter.

After matriculation, grades earned in courses completed within the context of the Bridge Program count within the student's undergraduate cumulative GPA (CGPA). Credits earned in Bridge Program courses do not count toward a student's undergraduate graduation requirements.

### Attendance and Lateness

Bridge Program students are required to follow the undergraduate policy on course attendance and lateness. Please see Attendance and Lateness in the Attendance, Withdrawal and Interruption of Studies section under Academic Policies and Regulations later in this catalog.

### Course Withdrawal

Withdrawal from Bridge Program courses follows the undergraduate course withdrawal policy. Please see Course Withdrawal in the Attendance, Withdrawal and Interruption of Studies section under Academic Policies and Regulations later in this catalog.

Bridge Program students cannot withdraw from ELP courses and maintain enrollment in UPA, math or physics courses.

## Evaluation and Promotion

Promotion within the Bridge Program is based on grades (which reflect class performance), scores on the mid-term and final exams, TOEFL or IELTS scores, and teacher recommendations. Upon passing, students are promoted to the next level.

## Repeating Courses

A student may repeat any course, pending seat availability. Only the last entry of the repeated course is counted in the calculation of the cumulative GPA.

## Exit from the Bridge Program

Students begin studies in their major courses in the semester after they satisfy both of the following criteria:

- achieve a score of 80 or above on the iBT (550 or above on the ITP) or 6.5 or above on the IELTS or a score of 6.0 on the IETLS combined with a minimum score of 6.0 on the Writing part
- pass ELP 200 and UPA 100 or satisfy all program requirements (ELPT score of 1)

Students may study in the Bridge Program for a maximum of one academic year. Students who have not matriculated after two semesters plus summer term may be disallowed from continuing their studies in the Bridge Program.

## Course Descriptions

**ELP 100 English Language Preparation 100 (15-3-2).** Focuses on comprehending and producing English at an intermediate level. Emphasizes reading modified academic texts, writing academic-style paragraphs, comprehending spoken English in academic settings and speaking at an intermediate level. Develops students' ability to take notes from short, modified academic lectures, express opinions and give short presentations. Builds skills needed to improve TOEFL scores to at least 500 (or 61 iBT) or IELTS scores to at least 5.5.

**ELP 100C English Language Preparation 100 (Contract) (15-0-0).** Focuses on comprehending and producing English at an intermediate level. Emphasizes reading modified academic texts, writing academic-style paragraphs, comprehending spoken English in academic settings and speaking at an intermediate level. Develops students' ability to take notes from short, modified academic lectures, express opinions and give short presentations. Builds skills needed to improve TOEFL scores to at least 500 (or 61 iBT) or IELTS scores to at least 5.5. Graded as Pass/Fail.

**ELP 200 English Language Preparation 200 (15-0-3).** Focuses on understanding and producing English at an upper-intermediate level (university entry). Emphasizes reading and discussing academic texts. Enhances skills in writing paragraphs and essays in response to the material and topics covered. Develops students' ability to understand complex ideas in texts, to apply critical thinking and to prepare for university situations. Builds skills required to meet the requirements to exit from the Bridge Program.

**ELP 200C English Language Preparation 200 (Contract) (15-0-0).** Focuses on understanding and producing English at an upper-intermediate level (university entry). Emphasizes reading and discussing academic texts. Enhances skills in writing paragraphs and essays in response to the material and topics covered. Develops students' ability to understand complex ideas in texts, to apply critical thinking and to prepare for university situations. Builds skills required to meet the requirements to exit from the Bridge Program. Graded as Pass/Fail.

**ELP 200T English Language Test Preparation 200 (0-3-0).** Focuses on TOEFL and IELTS skills required to meet the requirements to exit from the Bridge Program. Required for students who are registered in ELP200 but have not yet achieved the required TOEFL or IELTS scores to matriculate. Graded as Pass/Fail.

**ELP 250 English Language Preparation 250 (15-3-0).** Builds skills required to meet the requirements to exit from the Bridge Program. Emphasizes reading, listening to, and discussing academic texts and lectures. Enhances abilities to write summaries and essays in a variety of rhetorical modes. Limited to students who have passed ELP200 but have not yet achieved the required TOEFL or IELTS scores to matriculate. Graded as Pass/Fail.

**UPA 100 University Preparation (3-0-1).** Focuses on developing a positive attitude toward study at university and providing the skills necessary for success in all classes. Stresses goal setting, time management and specific study skills such as note-taking, presenting, critical thinking and accessing the library for academic research purposes. Designed for Bridge Program students.

**UPA 200 University Preparation for Non-Bridge Program Students (3-0-0).** Focuses on developing a positive attitude toward study at university and providing the skills necessary for success in all classes. Stresses goal setting, time management and specific study skills such as note-taking, presenting, critical thinking and accessing the library for academic research purposes. Designed for matriculated students on Academic Probation 1. Graded as Pass/Fail. Registration fee applies.

# Admission to Undergraduate Studies

American University of Sharjah places special emphasis on quality education. Applicants are considered based on their qualifications regardless of race, color, gender, religion, disabilities, age or national origin. The most qualified candidates are selected to fill the available places.

The medium of instruction is English and a good command of the language, both oral and written, is essential for students to be successful at AUS.

The university requires regular attendance at all classes. Students are not permitted to pursue AUS degrees through correspondence or by merely passing university examinations. AUS does not offer any degrees by distance education.

For admission consideration, secondary school grades and university grade point averages (if applicable) must meet the minimum established standards as set by the university.

Furthermore, applicants with previous college/university experiences applying to AUS as first-year students will be considered only if they were in good standing in their previous college/ university, provided seats are available.

**Application Process**

Admission to all AUS undergraduate programs is processed through the Office of Enrollment Management/Undergraduate Admissions. Applicants should address their inquiries and subsequent correspondence to:

American University of Sharjah
Office of Enrollment Management
Undergraduate Admissions
PO Box 26666
Sharjah, United Arab Emirates
+971 800 ASKAUS
infodesk.aus.edu

To apply to undergraduate studies at AUS, applicants must:

- complete the online application for applicants to an undergraduate degree program (www.aus.edu/apply)
- submit all application supplemental documents (details available at www.aus.edu/general-required-documents). Transfer applicants must also submit an official university transcript along with course descriptions.
- submit SAT scores, as applicable to their secondary school certificate (see Secondary School Certificates section hereafter)
- pay the application fee

The Office of Enrollment Management/ Undergraduate Admissions will notify the applicant of the university's final decision.

## First-Year Admission

### Minimum Admission Requirements

The university's minimum admission requirements depend on the applicant's type of secondary education program and certificate. For non-vocational certificates, only subjects classified by AUS as academic are accepted for admission consideration and the calculation of averages.

Admission to the university is competitive, and the actual required minimum average for admission consideration and to guarantee a seat will depend on:

- secondary education certificate or school average
- Internet-Based TOEFL (iBT) or AUS Institutional Paper-based TOEFL (ITP) or IELTS (Academic Version or IELTS Indicator) or Cambridge English Linguaskill online or EmSAT (Achieve) score
- number of qualified applicants
- number of available seats

The minimum required average for accepting an application for admission consideration is the equivalent of 80 percent or more in the final year of secondary education, or 80 percent or more in the best two out of the last three years. Higher averages may be applicable for certain colleges/school and/or specific majors. Other program-specific requirements or restrictions may also apply.

Furthermore, in order to be admitted to an AUS college/school, applicants must obtain a minimum score of:

- 80 on the Internet-Based TOEFL (iBT) or
- 550 on the AUS Institutional Paper-based TOEFL (ITP) or
- 6.5 on the academic IELTS or the IELTS Indicator
- 176 on Cambridge English Linguaskill online or
- 1550 on EmSAT (Achieve)

Scores are only valid for two calendar years. Students who score below the minimum required TOEFL, IELTS, Cambridge English Linguaskill online or EmSAT score but who otherwise meet AUS admission standards may be admitted to the Achievement Academy/Bridge Program at AUS. For information on matriculation into the chosen field of study after studying in the Bridge Program, please refer to the Exit from the Bridge Program section under the Achievement Academy/Bridge Program section. For details on application procedures and required documents or to apply online, please visit www.aus.edu/apply.

**Notes:**

- The AUS SAT code is 5543.
- The AUS iBT TOEFL code is 0526.
- The AUS AP code is 5543.
- The AUS ACT code is 7899.
- The AUS EmSAT code is AUS.

### Secondary School Certificates

**Recognized Secondary School Certificates**

Secondary school certificates are awarded either by ministries of education or by private schools and institutions.

AUS recognizes certificates awarded by ministries of education. However, some countries award two levels of secondary school certificates. In this case, the university recognizes the higher certificate.

The university accepts certificates awarded by private secondary schools that are recognized by their host country.

The university also accepts certificates awarded by recognized qualification authorities, international boards and national boards.

*Examples of Secondary School Certificates*

Following is a list of some common certificates and the corresponding minimum levels of performance required for accepting an application at AUS. These certificates and levels of achievement serve only as guidelines for admission and may change depending on the education system or school. They may differ from other institutions or the standards that are generally accepted in an applicant's native country.

The university may consider other types of secondary school certificates.

- **American-style High School Diploma:** minimum 3.0 CGPA (or equivalent) on a 4.0 scale (only subjects classified as academic are considered in the calculation of the CGPA). SAT math

scores or EmSAT math scores are also required.

- **Canadian High School Diploma:** minimum required average is the equivalent of 80 percent or more in the final year or in the best two years
- **French Baccalaureate or equivalent:** obtaining the baccalaureate with an average equivalent to 80 percent
- **German Abitur:** obtaining the abitur with a minimum of 7 in the final year
- **IGCSE, GCSE, GCE:** For an application to be accepted for admission consideration, applicants must complete at least five IGCSE/GCSE subjects with a minimum combined average of B and two GCE AS or A-level subjects with a minimum combined average of C in the subjects taken. In addition, applicants must meet the following conditions:
  - Applicants must complete 12 years (equivalent to American grade 12) of schooling. A School Leaving Certificate must be provided, showing the last grade (year) completed.
  - IGCSE/GCSE subject grades must be C and above.
  - GCE subject grades must be D and above.
  - Arabic and Islamic studies subjects are excluded (not counted) at both the IGCSE/GCSE and GCE levels.
  - Subjects must be from at least four different groups (such as art, humanities, languages, math, sciences, social studies).
  - Only subjects classified as academic by AUS (including arts and creativity subject group) will be accepted for admission consideration.
  - Priority in admission consideration and the selection of majors will be given to applicants who have completed more subjects than the minimum required and have achieved the highest grades.
- **Indian Board(s) Certificates:** Senior Secondary School Certificate (12th Standard) required, with an average equivalent to 80 percent, as calculated by the Office of Enrollment Management/Undergraduate Admissions
- **International Baccalaureate Diploma (IB):** obtaining the diploma and completing any six subjects, with at least three at the higher level
- **Lebanese Baccalaureate:** obtaining the baccalaureate with an average equivalent to 80 percent
- **National General Secondary School Certificates (Arts or Science):** minimum required average is the equivalent of 80 percent in the final year national exam, or 80 percent or above in the best two years
- **Pakistani Boards Certificates:** Senior Secondary School Certificate (12th Standard) required with an average equivalent to 80 percent or above, or a minimum average equivalent to 80 percent in the best two years, as calculated by the Office of Enrollment Management/Undergraduate Admissions

**Program Admission Requirements**

Certain types of secondary school certificates are accepted only for specific degree programs at AUS.

- Literary Certificates: Holders may be admitted to the College of Arts and Sciences (except for the bachelor of science degree programs in biology, chemistry, environmental sciences, mathematics and physics); the College of Architecture, Art and Design (except for the Bachelor of Architecture and the Bachelor of Interior Design degree programs); and any undergraduate degree program offered by the School of Business Administration.
- Scientific Certificates: Holders may be admitted to any undergraduate degree program in any of the colleges/schools.
- Technical and Vocational Secondary School Certificates: Highly motivated and academically qualified students may be admitted to an undergraduate degree program that corresponds to the nature of the technical or vocational secondary school program. For example, the holder of a technical secondary certificate in electricity may apply to the Bachelor of Science in Electrical Engineering degree program.

## Early First-Year Admission

A student in his/her final year of secondary school may apply for early provisional admission by submitting official final grade 10 and grade 11 result reports and SAT scores (where applicable; refer to Secondary School Certificates earlier in this section).

Early first-year admission is offered only to highly qualified applicants and is not considered final until students submit a recognized and official secondary school certificate, or equivalent, showing the successful completion of a secondary education and all items as requested in the applicant's letter of admission.

Students cannot register for courses until the admissions process has been completed.

## Advanced Standing Credit Hours Transfer

Students who achieve a minimum grade equivalent to B in the IB Higher Levels, GCE A-Levels, the Lebanese Baccalaureate, the French Baccalaureate, the German Abitur or the American Advanced Placement tests may be awarded course credit hours for first-year-level courses. For more information, refer to www.aus.edu/registrar/toc. The complete transfer policy is available from the Office of Enrollment Management/ Undergraduate Admissions.

Admitted applicants must submit a copy of their original secondary school certificate attested by the UAE Ministry of Education, or the appropriate authority, along with the subjects' descriptions to the Office of Enrollment Management/Undergraduate Admissions no later than the early registration of their second semester of study at AUS. Admitted applicants who submit their documents before their first semester of study will have their documents evaluated toward credit hours transfer as well as exemption from appropriate placement tests. More information on placement tests is provided in the following section.

No transfer of advanced standing credit hours will be awarded after completion of the first semester of study at AUS.

Admitted applicants will be notified of their transferred credit hours by the Office of the Registrar.

The Office of the Registrar maintains and updates the advanced standing students' records.

## Pre-entry Requirements for First-Year Students

**Placement Tests**

All first-year applicants who attain the minimum score for undergraduate admission on the TOEFL, IELTS, Cambridge English Linguaskill online or EmSAT are required to sit for placement tests appropriate for their intended majors as shown in the following table. Students who do not sit for the placement tests, with the exception of the Writing Placement Test (EPT), will be required to complete the corresponding preparatory course. Applicants who do not attain the required TOEFL, IELTS, Cambridge English Linguaskill online or EmSAT score but who otherwise meet AUS admission standards may be admitted to the Achievement Academy/Bridge Program at AUS. Please refer to the Achievement Academy section earlier in this catalog for details.

No student is allowed to sit for a placement test more than once. The sole exception is for mathematics placement tests if a student is changing programs and the mathematics requirement for the new program is different.

Students are not allowed to sit for a placement test once they have been registered in the corresponding course.

| Required Placement Tests | | | | | |
|---|---|---|---|---|---|
| Majors | Placement Test | | | | |
| | **Engineering Math** | **Business Math** | **Architecture Math** | **Physics** | **Writing** |
| Architecture/Interior Design | No | No | Yes | No | Yes |
| Biology/Chemistry/Environmental | Yes | No | No | Yes | Yes |
| Business Administration (all majors) | No | Yes | No | No | Yes |
| Computer Science | Yes | No | No | Yes | Yes |
| Design Management | No | Yes | No | No | Yes |
| Engineering majors | Yes | No | No | Yes | Yes |
| English Language and Literature | No | No | No | No | Yes |
| International Studies/Psychology | No | No | No | No | Yes |
| Mass Communication | No | No | No | No | Yes |
| Mathematics | Yes | No | No | Yes | Yes |
| Multimedia Design/Visual Communication | No | No | No | No | Yes |
| Physics | Yes | No | No | Yes | Yes |
| Undeclared Major | ** | ** | ** | ** | ** |

** Students with an undeclared major should take all the placement tests of their intended major.

**Notes:** The appropriate placement test(s) must be taken before a student can enroll in the corresponding first-year course.

Achievement Academy/Bridge Program students may take the math and/or physics placement tests if required by their intended majors. However, they are not allowed to take the Writing Placement Test.

**Exemption from Placement Tests**

*Advanced Standing Applicants*

Advanced standing applicants may be exempted from taking certain placements tests depending on subjects/courses completed and grades earned. For more information, refer to www.aus.edu/registrar/toc.

*Math Placement Tests*

Applicants who have completed SAT Subject Test-Math Level 1 or Math Level 2 with a minimum score of 600 are waived from taking the AUS math placement tests.

*Writing Placement Test (EPT)*

Taking the Writing Placement Test is mandatory for all applicants admitted to the first year. Applicants are exempted from taking the Writing Placement Test if they have achieved a minimum score of:

- 102 on the Internet-Based TOEFL (iBT) or
- 610 on the AUS Institutional Paper-based TOEFL (ITP) or
- 7.5 on the academic IELTS or on the IELTS Indicator or
- 191 on Cambridge English Linguaskill online or
- 1800 the EmSAT English Test

Advanced standing students granted credit hours for writing courses are waived from taking the Writing Placement Test.

**Preparatory Courses**

Students who do not attain the placement score necessary to register for the relevant 100-level course are enrolled in the appropriate preparatory course (i.e., MTH 00X, PHY 00X, WRI 00X).

The final grades of preparatory courses count toward the cumulative grade point average but the credit hours earned for preparatory courses do not count toward graduation requirements.

Students are allowed to repeat a preparatory course up to Sophomore I (less than 45 credit hours).

## Transfer Admission

### Admission Requirements

Depending on available seats, candidates transferring from institutions of higher education may be considered for admission, subject to the following conditions:

- They are transferring from independently accredited institutions of higher education recognized by the UAE Ministry of Education's Higher Education Affairs Division and offering learning experiences equivalent to those offered at AUS.
- They have successfully completed one or more semesters at their institution.
- They are in good standing (i.e., not on any probation or dismissal from the institution from which they are transferring).
- They achieved at their institution a minimum cumulative grade point average (CGPA) as required by AUS for that type of institution.
- Prior to their admission to the institutions from which they are transferring, they met the AUS requirements for admission.
- They meet the English language proficiency requirements of AUS.
- They submit official transcripts of their high school and college/university records along with the syllabi for and descriptions of courses they seek to transfer.

**Waiver of English Language Proficiency Requirement**

Transfer applicants granted transfer of credit hours for courses equivalent to AUS WRI 101 (Academic Writing I) or WRI 102 (Academic Writing II) courses are exempted from the AUS English language proficiency requirement and are waived from taking the Writing Placement Test. For more information on transfer of credit hours, please refer to the Transfer of Credit Hours section hereafter.

### Pre-entry Requirements for Transfer Students

Depending on credit hours transferred, transfer students might need to sit for certain placement tests. Please check the information on Pre-entry Requirements for First-Year Students earlier in this section for details on placement tests and preparatory courses.

**Exemption from Placement Tests**

Transfer applicants may be exempted from taking certain placements tests depending on transferred courses.

*Math and Physics Placement Tests*

Transfer applicants granted transfer of credit hours for courses equivalent to AUS math or physics courses are waived from taking the corresponding AUS math or physics placement tests.

*Writing Placement Test*

Transfer applicants granted transfer of credit hours for courses equivalent to AUS WRI 101 (Academic Writing I) or WRI 102 (Academic Writing II) courses are waived from taking the Writing Placement Test.

### Transfer of Credit Hours

Transfer applicants from two-year community colleges in North America and four-year colleges/universities with a similar mission to AUS may be awarded transfer of credit hours. The minimum required course grade(s) to be considered for credit hours transfer will depend on the institution from which the applicant is transferring.

Transfer applicants with transcripts from two or more institutions of higher education are eligible for transfer evaluation of only the courses completed at the institutions meeting the AUS transfer admission requirements.

Admitted transfer applicants must submit their official transcripts, syllabi and requested work samples to the Office of Enrollment Management/ Undergraduate Admissions by the file completion deadlines announced by the office and published in the admission package. In addition to the official transcript and the syllabi and descriptions for courses students seek to transfer, some programs may require applicants to submit samples of their work, assignments and/or examinations. Applicants who seek transfer of credit hours for studio courses are advised to provide a portfolio of completed course work in photographic, digital or original format.

Files completed by the published deadlines will be evaluated, and admitted transfer applicants will be awarded transfer credit hours, as applicable, before the first day of registration of the student's first semester at AUS. Files not completed by the deadline may be evaluated during the first semester at AUS. No transfer of credit hours will be awarded after completion of the first semester of study at AUS. Transcripts of transfer students will be evaluated only once.

Courses identified as equivalent in content and level to AUS courses will be transferred as the equivalent AUS course. Other appropriate university-level courses may be transferred as free electives or as unassigned courses meeting specific degree requirements. Transfer of credit hours will not be accepted for graduation project courses.

Courses completed more than five years prior to matriculation as an undergraduate student at AUS are not transferable.

No engineering or computer science courses will be considered for transfer from academic programs not recognized by ABET, Inc. (www.abet.org).

Courses related to areas taught within the School of Business Administration will be evaluated for transfer of credit hours only if they were completed within institutions accredited by the Association to Advance Collegiate Schools of Business (AACSB www.aacsb.edu), the European Quality Improvement System (EQUIS) or from universities approved by the School of Business Administration.

No more than 50 percent of the credit hours required to earn a degree from AUS may be transferred from another institution. A maximum of 30 credit hours may be transferred from an institution where the language of instruction is not English. In addition, transfer students must satisfy the university's graduation residence requirements as outlined in the Academic Policies and Regulations section of this catalog.

Grades earned on a transferred course do not transfer and will not be used to calculate the student's cumulative grade point average (CGPA). The transfer course(s) could be used to satisfy registration and graduation requirements where applicable.

Students will receive an email notification of their transferred credit hours by the Office of the Registrar. While credit hours will be temporarily transferred, the student will not be awarded his/her bachelor's degree until AUS receives verification of the host institution's transcript from the UAE Ministry of Education's Higher Education Affairs Division.

The decision regarding credit hours awarded is made by the appropriate academic division at AUS with input from faculty with expertise in the subject area. The Office of the Registrar maintains and updates the transfer students' records.

The complete transfer policy is available from the Office of Enrollment Management/Undergraduate Admissions.

## Applicants for a Second Degree

Applicants who have completed an undergraduate degree at AUS are not eligible to apply for a second undergraduate degree at AUS.

Applicants with an undergraduate degree earned at another independently accredited university recognized by the UAE Ministry of Education's Higher Education Affairs Division and by AUS may apply for a second undergraduate degree at AUS. Courses completed within the context of the first undergraduate degree program will not be evaluated for transfer of credit hours or course waivers towards the AUS degree program graduation requirements.

Applicants for a second undergraduate degree must complete the New Applicant online application by the dates specified in the Application Deadlines section hereafter. The official transcript of the previously earned undergraduate degree must be submitted. After completing their application, applicants should contact infodesk@aus.edu to request admission as applicants for a second degree.

To be considered for admission, applicants must meet the minimum established university admission requirements, as well as any additional requirements specific to the degree program they are applying for. For details, refer to Program Admission Requirements under First-Year Admission earlier in this section of the catalog.

## Non-degree Admission

Non-degree status is assigned to students who enroll in courses at AUS without pursuing a degree. Non-degree status does not apply to exchange, transient and visiting students.

Non-degree undergraduate applicants must meet the same minimum admission criteria established for first-year or transfer admission and must submit the corresponding online application by the dates specified in the Application Deadlines section hereafter. Applicants must apply to the undergraduate degree program offering the courses they are interested in. After submitting their application, applicants should contact infodesk@aus.edu to request admission as Non-Degree students.

Non-degree undergraduate students are not eligible for financial grants or scholarships.

AUS undergraduate students who have been dismissed or who interrupt their studies may not apply for admission as non-degree seeking students.

AUS students enrolled in a degree program may not change their status to non-degree seeking students.

Non-degree undergraduate students may enroll in any undergraduate university course for which they have the necessary academic background and qualifications. They register for courses with the assistance of the College of Arts and Sciences. In courses with enrollment limits, priority is given to AUS degree-seeking students.

Non-degree undergraduate students may request to change status to undergraduate degree-seeking students. For details, please refer to the Change of Status section hereafter.

## Returning Students

Students in good standing who leave AUS for two or more consecutive semesters, inclusive of a semester of complete course withdrawal, and wish to resume studies must complete the online Returning Applicant application. Students on academic probation and dismissed students may not apply for readmission

Readmission of returning students is subject to AUS academic rules and regulations on readmitting students. All admission requirements in place at the time of applying for readmission must be met.

Courses taken at another institution while on leave from AUS will not be transferred.

## Applicants with Mobility Issues

Depending on available facilities and the type of physical condition, the university may provide special services to applicants with mobility issues. Applicants are requested to contact the Office of Student Affairs at studentaffairs@aus.edu to determine if a specific service can be provided by AUS. This information will be treated confidentially.

## Application Deadlines

All applications for admission must be on file in the Office of Enrollment Management/Undergraduate Admissions by the following dates:

**Spring Semester 2021**

*Regular Applications:*

December 24, 2020

**Summer Term 2021**

*Regular Applications*

May 20, 2021

**Fall Semester 2021**

*Early Applications*

April 15, 2021

*Regular Applications:*

July 15, 2021

Upon receipt, AUS will investigate the authenticity and accuracy of all submitted documents/materials.

Admitted international students who need visas for the UAE should submit the visa application form, available on the AUS website at www.aus.edu/admissions/international-students/student-visas, at least two months prior to the first day of class.

## The Offer of Admission

The offer of admission, regardless of type, is valid only for the semester for which a student applies.

If an applicant is granted admission for a certain semester and for some reason decides not to register in that semester, the applicant may request, in writing, deferring admission for the following semester only. Admission consideration for the following semester will depend on available seats and the applicable admission criteria.

Applicants wishing to change the degree program they were admitted to post admission must submit a new application. The application fee will apply.

### Admission Deposit

All admitted students, regardless of type, are required to pay a seat reservation deposit of UAE Dirhams (AED) 5,000 and a residential hall room reservation deposit (if applicable) of AED 500 by the deadline indicated in the letter of admission. Both deposits are non-refundable, non-transferable to others and cannot be utilized for any other purpose than the intended. These deposits are deductible from the student's bill if the applicant joins AUS in the semester of admission. If a student requests to defer admission to the following semester and the request is approved, both deposits will be applied to the following semester's invoice.

### Falsified Admission Documents

American University of Sharjah reserves the right to take disciplinary action up to and including the revocation of admission or permanent dismissal if the university determines that information has been misrepresented in application documents or falsified documents have been submitted in support of an application for admission or matriculation.

## Other Admission Categories

### Exchange Student Admission

An exchange student is not formally admitted to American University of Sharjah but is allowed to take courses at the university in the context of a semester exchange program. Exchange students should check with their home institutions about the transferability of AUS credit hours to their programs.

To be admitted as an exchange undergraduate student, a student must be enrolled in an undergraduate degree program at an accredited institution and be in good academic standing in his/her current institution. In addition, students must have attained a minimum Internet-Based TOEFL score of 80 or a minimum IELTS (Academic Version or the IELTS Indicator) score of 6.5 or a score of 176 on Cambridge English Linguaskill online or they must have successfully completed the CEFR English C1 level. Exchange students coming from institutions located in an English-speaking country and where English is the language of instruction, or from institutions with an English language proficiency admission requirement higher than at AUS, are exempt from this requirement.

Students must first apply through the study abroad office at their home institutions. In addition, they must submit to the AUS International Exchange Office (IXO) a complete online application, accessible through www.aus.edu/ixo, along with an official university transcript showing courses in progress at the time of application. To secure seats in courses, applications should be submitted by the first Saturday of March for summer and fall enrollment, and the first Saturday of October for spring enrollment.

Exchange undergraduate students register through IXO. They may enroll in any university undergraduate-level course for which they have the necessary academic background and qualifications. In courses with enrollment limits, priority may be given to AUS students. Tuition and fees are governed by exchange agreements. Details are available with AUS IXO.

Normally, a student is allowed to register as an exchange student for not more than one academic year.

For further information, please contact IXO at ixo@aus.edu.

Undergraduate students admitted as exchange students may request to change status to undergraduate degree-seeking students. For details, please refer to the Change of Status section hereafter.

### Transient Student Admission

Transient student status is assigned to students who have obtained their undergraduate or graduate degrees from AUS and have returned to take extra course(s) at AUS.

Applicants seeking undergraduate transient student status at AUS and meeting the above criteria could be considered for undergraduate transient

student admission. Applicants must submit to the Office of the Registrar the complete Transient Student Application available at www.aus.edu/registration/forms.

Undergraduate transient students may enroll in any university undergraduate-level course for which they have the necessary academic background and qualifications. They must register for courses through the Office of the Registrar. In courses with enrollment limits, priority is given to AUS students.

Normally, a student can register as a transient student for no more than one academic year.

For further information, please contact the Office of the Registrar at registration@aus.edu.

### Visiting Student Admission

A visiting student is one who is not formally admitted to American University of Sharjah but is allowed to take courses at AUS for transfer back to the student's home institution. Visiting students are not registered in the context of a semester exchange program between AUS and the student's university. Visiting students should check with their home institutions about the transferability of AUS credit hours to their programs.

To be admitted as a visiting undergraduate student, a student must be enrolled in an undergraduate degree program at an accredited institution and be in good academic standing in his/her current institution. In addition, students must have attained a minimum Internet-Based TOEFL score of 80 or a minimum IELTS (Academic Version or the IELTS Indicator) score of 6.5 or a minimum score of 176 on Cambridge English Linguaskill online or a minimum EmSAT (English Test) score of 1550, or they must have successfully completed the CEFR English C1 level. Visiting students coming from institutions located in an English-speaking country and where English is the language of instruction, or from institutions with an English language proficiency admission requirement higher than at AUS, are exempt from this requirement.

Applicants seeking visiting student status must submit to the AUS International Exchange Office (IXO) a complete online application accessible through www.aus.edu/ixo, along with an official university transcript showing courses in progress at the time of application. To secure seats in courses, applications should be submitted by the first Saturday of March for summer and fall enrollment, and the first Saturday of October for spring enrollment.

If the application is approved, registration is completed through IXO. Visiting undergraduate students may enroll in any university undergraduate-level course for which they have the necessary academic background and qualifications. In courses with enrollment limits, priority may be given to AUS students. Tuition and fees of visiting students coming through third-party providers are governed by annual financial agreements. Details are available with AUS IXO. Visiting students applying directly to AUS are charged the same tuition and fees as undergraduate students.

Normally, a student is allowed to register as a visiting student for not more than one academic year.

For further information, please contact IXO at ixo@aus.edu.

Undergraduate students admitted as visiting students may request to change status to undergraduate degree-seeking students. For more information, please refer to the Change of Status section hereafter.

## Change of Status

Students may request a change of status from non-degree to undergraduate degree status or from exchange/visiting to undergraduate degree status. Interested students must submit the Transfer Applicant online application form by the deadlines specified in Application Deadlines earlier in this section. All admissions requirements for transfer admission in place at the time of the change of status request must be met. In addition, students wishing to transfer to degree status must have achieved a minimum cumulative GPA of 2.00 in courses completed at AUS.

Courses taken at AUS while under exchange/non-degree/visiting status can be used to satisfy registration and graduation requirements where applicable. Grades earned in such courses will count in the cumulative grade point average (CGPA).

Courses completed outside AUS prior to admission to the degree program are evaluated for transfer of credit hours at degree program admission time. The university deadlines, rules and regulations governing transfer courses and credit hours will apply.

The degree program graduation requirements are determined by the catalog effective when the student is admitted to the degree program. For more information, please refer to the Catalog section under Graduation Requirements in Academic Policies and Regulations later in this catalog.

# Academic Integrity

## Student Academic Integrity Code

Academic integrity lies at the heart of intellectual life. As an institution committed to the advancement of knowledge in a manner consistent with the highest ethical standards, AUS affirms the importance of respecting the integrity of academic work. The AUS Student Academic Integrity Code (referred to herein as Code) describes standards for academic conduct, students' rights and responsibilities as members of an academic community, and procedures for handling allegations of academic dishonesty.

In order to establish within the AUS student body a sense of ethical responsibility, honor and mutual respect, prior to registration, every student must sign the following Academic Integrity Pledge:

*I [student's name] pledge my commitment to the following values:*

- *I will hold myself accountable for all that I say and write;*
- *I will hold myself responsible for the academic integrity of my work;*
- *I will not misrepresent my work nor give or receive unauthorized aid;*
- *I will behave in a manner that demonstrates concern for the personal dignity, rights and freedoms of all members of the community;*
- *I will respect university property and the property of others; and*
- *I will not tolerate a lack of respect for these values.*

Students are responsible for becoming familiar with their rights and responsibilities as defined by the Code and for ensuring that they understand the requirements for their particular courses (e.g., regarding issues such as collaborative work, use of study aids or take-home examinations, etc.).

Attempts to violate or to assist others in violating the Code, including unsuccessful attempts, are prohibited and will be treated as actual violations.

### Definition of Academic Violations

Members of the AUS academic community are expected to conduct themselves with integrity in their work and actions. Violations of the Code include, but are not limited to, the following categories.

**Plagiarism**

To plagiarize is to use the work, ideas, concepts, images or words of someone else without fully acknowledging the source in all academic work, including assignments, quizzes, examinations, papers and projects. Plagiarism may involve using someone else's wording—a distinctive name, a phrase, a sentence or an entire passage or essay—without using quotation marks and appropriately citing the source. Plagiarism may also involve misrepresenting the sources that were used or expressing the ideas of someone else in your own words without the appropriate citation.

**Inappropriate Collaboration**

Collaboration on academic work may be encouraged, but it is important to ensure that contributions are acknowledged. Inappropriate collaboration includes working with someone else in developing, organizing or revising a project (such as a paper, an oral presentation, a research or design project or a take-home examination) without acknowledging that person's help. The use of unauthorized assistance must be avoided in the production of all academic work.

Specific requirements related to collaborative work, peer review, the use of an external entity in the production of work, the use of tutors and editing may vary among courses and students must ensure that faculty members explicitly provide approval in advance of the collaboration.

**Impersonation**

Students must attend their own classes, be present and sit for all tests and examinations, and personally attend other events associated with a course. The individual impersonated and the impersonator may be subject to sanctions.

**Dishonesty in Examinations and Submitted Work**

All academic work and materials submitted for assessment must be the sole original work of the student, unless otherwise directed by the instructor. Students are prohibited from submitting any material prepared by or purchased from another person or company.

Communication is not allowed between or among students, nor are students allowed to consult books, papers, study aids or notes without explicit permission by the faculty member responsible for the course. Dishonesty includes, but is not limited to, communication with another student or an external party using electronic devices during an examination or in-class assignment, copying from another's paper, giving unauthorized assistance, obtaining unauthorized advance knowledge of examination questions, and the use of mechanical or marking devices or procedures for the purpose of achieving false scores on machine-graded examinations.

Specific policies regarding examinations may vary among individual professors.

**Work Completed for One Course and Submitted to Another**

Students may not present the same work for more than one course. Under exceptional circumstances, faculty members may permit a significant piece of research to satisfy requirements in two courses. However, both professors must agree in advance to this arrangement. If past research is incorporated into current projects, previous work must be appropriately referenced.

**Deliberate Falsification of Data**

Students may not deliberately falsify data or distort supporting documentation for course work or other academic activity.

**Interference with Other Students' Work**

Students may not intentionally interfere with the work of others, such as sabotaging laboratory experiments, creative work, research or digital files, or by giving misleading information or disrupting class work.

**Copyright Violations**

Copyright laws must be observed. These laws govern practices such as making use of printed materials, duplicating computer software, duplicating images, photoduplicating copyrighted materials and reproducing audio/visual works. The Code prohibits theft and the unauthorized use of documents and requires adherence to the laws of Sharjah and the federal laws of the UAE.

The AUS library offers a Copyright and Permissions Service and can assist students with issues and questions related to copyrighted materials and their use. Students may contact copyright@aus.edu for assistance.

**Complicity in Academic Dishonesty**

Complicity in academic dishonesty consists of helping or attempting to help another person commit an act of academic dishonesty or willfully assisting another student in the violation of the Code. Complicity in academic dishonesty is pre-meditated

and intentional. This can include, but is not limited to, the following:

- doing work for another student
- designing or producing a project for another student
- willfully providing answers during an exam, test or quiz
- communicating with another student or external party on a computer, mobile phone or other device while an exam is in progress
- providing a student with an advance copy of a test
- posting of notes or other materials from a class (whether the student is enrolled in the class or not) on the Internet, whether or not for a fee, without express permission from the faculty member
- leaving inappropriate materials behind at the site of an exam or test

## Adjudication of Academic Offenses

### Jurisdiction

Academic cases resulting from alleged violations of the Code are within the jurisdiction of the dean (or appointed designee) of the college/school in which the alleged Code violation occurred.

Faculty members who have knowledge of an alleged violation should report the incident to the dean (or appointed designee) of the college/school in which the alleged Code violation occurred.

A faculty member may exercise discretion in those cases involving a student's judgmental error rather than willful violation of the Code.

Students who wish to bring charges against other students must do so through the faculty member in whose course or academic activity the alleged Code violation occurred. The student who brings the charges must identify himself/herself to the faculty member.

Violations of the Code that involve admission and/or placement testing fall within the jurisdiction of the Vice Provost for Undergraduate Affairs and Instruction and may result in the revocation of admission or dismissal from the university.

### The Adjudication Process

An allegation of dishonesty must be reported to the dean (or appointed designee) within five working days of the date of discovery of the alleged offense. Normally, an allegation of academic dishonesty must be reported during the semester in which it occurred, however there may be situations in which a violation is discovered after the semester has ended. Reports of an alleged violation must be supported by appropriate documentation.

Once the alleged violation has been reported, faculty members must not submit grades for the work in question or for the course until the case has been adjudicated. If the semester grades are due before the adjudication process is complete, a temporary grade of N will be assigned and a "Pending Conduct Investigation" statement will be recorded on the student's academic transcript.

The student must remain enrolled in the course in which an infraction has been reported until the adjudication process is complete.

Legal counsel or involvement of any parties other than the student and relevant university personnel is not permitted at any point during the adjudication process.

After receiving complete information, the dean (or appointed designee) will follow the adjudication process outlined below:

a. The dean (or appointed designee) will promptly notify the student of the allegation and inform the student of the date and time of a formal meeting to discuss the charge.

b. The dean (or appointed designee) will meet with the student to explain the adjudication process and present the charge and the evidence. If the student fails to attend the meeting, the dean (or appointed designee) will proceed with the process.

c. The student will be given the opportunity to respond to the allegation in writing within two working days.

d. After the deadline for the student to respond to the allegation has passed, the dean (or appointed designee) will consider all evidence and, depending on whether a preponderance of evidence supports the allegation of academic misconduct, take one of the following actions:

   i) dismiss the case

   ii) request that the student resubmit the work in question or retake an examination

   iii) assign a penalty

e. If a student resubmits the work in question or retakes an examination, the results will be considered in determining whether a preponderance of evidence exists to support the allegation of academic misconduct and the assignment of a penalty.

### Penalties

Violations of the Code will be treated seriously, with increasingly severe penalties considered for repeat offenders. A second violation may result in suspension or dismissal.

In assigning a penalty, the dean (or appointed designee) will take into account both the seriousness of the offense and any particular circumstances involved.

Penalties for an academic offense may include one or more of the following:

a. a lowered grade or loss of credit for the work found to be in violation of the Code (to be specified at the time that the penalty is assigned)

b. a lowered overall grade for the course in which the offense occurred (to be specified at the time that the penalty is assigned)

c. a failing grade of XF for the course in which the offense occurred (to be specified at the time that the penalty is assigned)

d. suspension for the semester/term in which the offense occurred with a possible addition of one or more academic semester(s)/term(s)

e. dismissal from the university

Penalties (a)–(e) will result in non-academic sanctions that may include prohibition from extracurricular activities and the loss of athletic scholarships. See the *AUS Student Handbook* for details.

For penalties (d) and (e), the student is assigned a grade of N for all semester/term registered courses, with a provision for a grade penalty for the course where the academic offense was reported. No refund or cancellation of tuition fees will be permitted in such cases.

Students are solely responsible for any financial implications resulting from an academic integrity violation.

Students found guilty of an academic integrity violation will not be allowed to complete a course evaluation for the course in which the offense occurred.

Students with a record of sanctions resulting from violations of the Code (or Student Code of Conduct) will not be eligible for the Dean's List.

### Suspension and Dismissal

The decision as to whether suspension or dismissal is appropriate in a given instance will necessarily depend on the circumstances of each case.

**Suspension**
(temporary separation from the university)

Suspension is effective for not less than the semester/term in which the penalty is levied or for not more than one calendar year. The length of a suspension must be specified in writing when the student is notified of the outcome of the adjudication process.

A student who is suspended is entitled to resume studies in the same college/school at the conclusion of the period of suspension if all academic requirements are met. The student must submit a Reactivation Request Form to the Office of the Registrar. The form is available at www.aus.edu/registration/forms.

Courses completed outside AUS while on suspension do not transfer.

**Dismissal**
(permanent separation from the university)

Dismissal is invoked in cases of serious infractions of rules and regulations and when circumstances indicate that a student's association with the university should be terminated in the interest of maintaining the standards of behavior and conduct normally expected in a university community.

In instances where the dean (or appointed designee) hearing the case has recommended dismissal, the Academic Appeals Review Committee will review the case and make a recommendation to the Provost.

## Notification of Penalty

The dean (or appointed designee) hearing the case will notify the student in writing of the outcome of the adjudication process and, if applicable, the assigned penalty.

In addition to the faculty member bringing the charge, the following university officials have a legitimate need to know and will be informed of the outcome of the adjudication process at the time that the student is notified:

- The head of the department in which the offense occurred
- The dean of the college/school and the head of the department responsible for the major in which the student is enrolled (if applicable)
- The Vice Provost for Student Life
- The Office of the Registrar
- The Academic Support Center
- The Vice Provost for Undergraduate Affairs and Instruction

For record keeping of documents pertaining to the infringement of the Code, please refer to the appropriate section under Student Records herein.

## Appeal of Penalty

In cases concerning notation to the student's record [penalties (c)–(e)], students will be notified in writing of their right of appeal. Appeals must be submitted in writing to the Vice Provost for Undergraduate Affairs and Instruction within five working days of the date of notification of the outcome of the adjudication process by the dean (or appointed designee).

Appeals are limited to grounds of excessive sanction, improper procedure and unavailability of relevant evidence at the time of the meeting with the dean (or appointed designee) to discuss the charge with the student.

The Vice Provost for Undergraduate Affairs and Instruction may affirm, modify, or remand the case to the dean (or appointed designee) with instructions for further action. The decision of the Vice Provost is final.

For penalty (e), the Academic Appeals Review Committee will review the case and make a recommendation to the Provost. The Provost may affirm, modify, or remand the case to the dean with instructions for further action. The decision of the Provost is final.

## Notation of an Academic Integrity Code Violation Penalty

A student's standing that impacts his or her eligibility to continuously enroll at AUS affects academic progress and, for this reason, is deemed transcript-appropriate. The general type of infraction (academic or disciplinary) is noted on the student's transcript, as well as the office responsible for issuing the student's separation from the institution.

Penalties (c)–(e) will become a permanent part of the student's file maintained by the Office of the Registrar, with appropriate notation on the student's academic transcript indicating that there has been a violation of the Code.

For penalties (d) and (e), the student is assigned a grade of N for all semester/term registered courses, with a provision for a grade penalty for the course where the academic offense was reported.

The student may petition to replace an XF grade resulting from a category (c) penalty with an F grade at the time of graduation or following complete withdrawal from the university. For details, please refer to the Appeal of an XF Grade section under Student Petitions and Appeals.

For tracking purposes, all academic integrity violations will be recorded in the university's academic integrity database maintained by the Office of the Vice Provost for Academic Affairs and Instruction.

# Student Records

## Custody of Records

All transcripts and other documents students submit from other institutions at the time of admission or later are the property of AUS, and, as such, are part of the student record that is under the custody of the Office of the Registrar. The university is not required to provide (or allow the making of) copies of these documents. Transcripts submitted to AUS for admission or credit hours transfer cannot be returned to the student or forwarded to other institutions.

The academic record of an individual student is maintained by the Office of the Registrar for a maximum period of five years after the student graduates or leaves AUS. Beyond this retention limit, documents in a student's record are managed in accordance with the AUS Office of the Registrar policy on file retention, which could entail permanent destruction of some of these documents.

## Student Privacy Rights

The university reserves the right to disclose students' records to the parent, the immediate guardian of the student and to the private or public authority sponsoring the student, if applicable. AUS is required to comply with requests for student information originating from the UAE Government and the Sharjah Government

Students have the right to:

- inspect and review information contained in their educational records. The university is not required to provide (or allow the making of) copies of these documents. Under specific circumstances, the university may allow specific documents included in a student's record to be provided. Requests for copies of documents will be reviewed after submission of a signed request from the student concerned.
- request changes or updates to their personal data. Registered students are given access to update their emergency telephone/mobile contact numbers and their personal email address via the secured online student information system. For mailing address updates, an official request signed by the student concerned must be submitted to the Office of the Registrar/Student Records section. The form is available at www.aus.edu/registration/forms.
- request non-disclosure, within the extent of UAE federal and local laws, of personally identifiable and/or academic information from education records.

For further information on students' records, please check with the Office of the Registrar/Student Records section.

## Academic Transcripts

The Office of the Registrar maintains and updates the academic records of all students who register at the university. The permanent record reflecting the academic achievements of each student throughout his/her entire study period at the university is referred to as academic transcript or transcript.

At the end of every semester/term, the Office of the Registrar updates the academic transcripts of the students who were registered in that semester/term. Students may access their transcripts through the secure online student information system. Students are encouraged to review their records online periodically. Online transcripts are not official and are only intended to update students on their academic achievement.

At the end of any given semester/term, the Office of the Registrar mails the students who are not in good academic standing an unofficial copy of their updated transcript. These transcripts are mailed to the address maintained in the student's record at the Office of the Registrar. For details on academic standing policy, refer to Academic Standing in this section of the catalog.

Students may obtain copies of their academic transcripts at AUS from the Office of the Registrar. Transcripts will only be released with a signed request from the student concerned (request form available at www.aus.edu/registration/forms) or an online request submitted by the student via the secured student information system. A nominal fee applies. The university will issue only complete transcripts, not parts of the student record.

A brief explanation of the university's grading system is provided on the back of every official transcript. The detailed explanation is included in the Grades and Academic Standing section herein.

## Records on Academic Integrity Code Violations

The retention of records on academic integrity code violations is governed by the following:

- In cases where penalties (a)–(c) were assigned: All records pertaining to the infringement of the Student Academic Integrity Code are maintained by the student's college/school. If the student does not graduate from AUS, the records are retained for five years after the student's last registration. If the student graduates from AUS, these records are destroyed by the college/school upon the student's graduation.
- In cases where penalties (d)–(e) were assigned: The notation indicating a violation of the Student Academic Integrity Code will become a permanent part of the student's file maintained by the Office of the Registrar.
- For tracking purposes, all violations are recorded on the university's academic integrity database maintained by the Office of the Vice Provost for Academic Affairs and Instruction.

Records on Student Academic Integrity Code violations maintained by the Office of the Registrar are subject to university regulations concerning the confidentiality of student records. Upon written request, students have the right to inspect their records related to violations of the integrity code.

## Enrollment Verifications and Certifications

Students may need different types of official certificates pertaining to their academic record at AUS. These certificates must be requested from the Office of the Registrar using the request forms available at www.aus.edu/registration/forms. A nominal fee applies.

# Registration and Course Information

## Course Registration

### Assessment

AUS administers standardized tests to assess student learning. Although individual test scores do not affect academic standing or appear on official transcripts, test results provide students with an opportunity to compare their performance to those of students in other universities. The test scores are used by AUS to better understand and support student learning.

Students who are selected for testing and are unavailable due to a documented illness or time conflict resulting from course schedules must petition for an exception prior to the test date. For further details, contact the Office of Institutional Research and Analysis at oira@aus.edu. Those students who are not granted an exception and who choose not to complete the test will not be eligible for priority registration during the Early Registration period.

### Orientation Program

Prior to registration, academic orientation is held for all new students to introduce them to the university's general academic regulations, policies and support services. In addition, each college/school has an orientation to familiarize students with its specific regulations and assist them with the registration process. The Office of Student Affairs also introduces university life through campus tours and visits, meetings, lectures, demonstrations and other activities. The program is aimed at helping new students adjust to AUS, meet other new students and speak with senior students who assist with the orientation program.

Attendance at these programs is mandatory for all new students.

### Registration Process

Before the registration period begins, the Office of the Registrar posts the registration guide at www.aus.edu/registration. The guide provides pertinent information and indicates the registration steps along with the place, date and time for each step. A continually updated list of courses offered is posted on the online student information system as well. Students should carefully read the registration guide as they prepare for registration and meet with their academic advisor.

Registration involves three main steps:

- academic advising
- selection and registration of courses
- payment of fees

New students and transfer students register with the assistance of their respective colleges/school. New and transfer students must ensure that all documents required for finalizing their admission, particularly those indicated in the letter of admission, are submitted to the Office of Enrollment Management/Undergraduate Admissions by the file completion deadlines announced by the office and published in the admission package. Transfer files completed by the deadlines will be evaluated for transfer of credit hours. For details, refer to Transfer of Credit Hours under Admission to Undergraduate Studies earlier in this catalog.

Exchange and visiting students register through the International Exchange Office (IXO). Non-degree students register with the assistance of the College of Arts and Sciences. Study abroad and transient students register with the Office of the Registrar. For further details, see the corresponding sections under Admission to Undergraduate Studies earlier in this catalog.

Continuing and returning students register through the AUS student information system.

All registered students may be required to complete course evaluations for courses they are enrolled in prior to the beginning of the early registration period of the following semester/term. If required, students who do not complete all surveys during the course evaluation period will not be eligible for early registration.

In cases of limited seat availability, AUS may give priority to students who have not had an opportunity to take a course for the first time. During the early registration period, the university reserves the right to drop students who are repeating courses that were previously completed with a grade of C- or above. For violations related to registration, refer to the Student Code of Conduct in the *Student Handbook*, also accessible at www.au.edu/student-handbook.

### Academic Advisors

Academic advising is an essential element of the educational process. American University of Sharjah requires advisor-student conferences at least once per semester/term.

Students are assigned academic advisors who help them in selecting their courses of study and in planning their schedules. Their advisors also approve their schedules each semester/term. However, students are responsible for selecting their courses, meeting course prerequisites and adhering to the most recent university policies and procedures. The advisor assists the student in obtaining a well-balanced education and in interpreting university policies and procedures.

Students may also consult faculty members, department heads, program coordinators and associate deans or deans.

Students on academic probation are provided additional advising and guidance by the Academic Support Center.

### Student Course Load

**Semester/Term Course Load**

A student admitted to and enrolled in a degree program normally registers for 15 to 19 credit hours each semester. A student can register for up to two courses in a six-week summer term. Only one of the two courses may have a lab component.

The degree programs have been designed to be completed normally in four years, except for the Bachelor of Architecture, which is a five-year program. However, some students may require additional time. The proposed sequence of study for every program is intended to assist students in planning their semester/term course load so that they complete their degree requirements within the normal time limit of their respective programs.

**Full-Time Students**

The required minimum load for a full-time student is 12 credit hours per semester, and the maximum load is 19 credit hours per semester.

**Part-Time Students**

Part-time students are those students who register for less than 12 credit hours in a given semester.

Degree-seeking students are expected to maintain full-time status. Degree-seeking students with academic difficulty could be moved to part-time status by their Academic Support Center advisor. Due to special medical conditions or other special considerations, a degree-seeking

student could select to move to part-time status.

Part-time students are not evaluated for placement on the Dean's List and the Chancellor's List (see University Honors and Awards later in this section). Part-time students are normally not candidates for AUS disbursed financial grants or scholarships (for details, refer to the Tuition, Grants and Scholarships section later in this catalog). Some other AUS privileges of full-time, degree-seeking students might not be available to part-time students.

**Overload Students**

A student who has attained senior standing and a minimum cumulative GPA of 3.25 may seek the permission of his/her dean (or designee) to register for up to 21 credit hours in the semester of graduation or in the spring semester preceding graduation during a summer term. All credit hours exceeding 16 credits will require a supplemental fee.

**First-Year Students Course Load**

First-year students are normally restricted to five courses per semester to allow time for their adjustment to the learning environment of AUS. First-year students placed in two or more preparatory courses (e.g., MTH 001, WRI 001, etc.) in a semester should register for a maximum of 13 credit hours.

**Probation Students Course Load**

An undergraduate student on Academic Probation 1 is allowed to carry a maximum load of 16 credit hours. An undergraduate student who is on Academic Probation 2 may only register for a maximum load of 13 credit hours.

## Add and Drop

Students are allowed to add and/or drop courses at the beginning of every semester/term. The add and drop period begins on the first day of class. The duration of the add and drop period may vary, and the actual dates are published in the registration guide for each semester/term, available at www.aus.edu/registration.

Courses dropped during the add and drop period are not recorded in the student's transcript. The semester/term tuition is recalculated accordingly with no fee penalty charged. Students interested in adding and/or dropping courses should first consult with their respective advisors.

## Auditing Courses

An AUS student who wishes to attend a course but who does not wish to take examinations, receive a final grade and receive credit for the course may register to audit the course with the permission of the instructor and approval of the associate dean for undergraduate studies of the college/school offering the course. The instructor may establish standards of class participation and attendance that must be met if a student is to remain in audit status.

Registration is managed through the Office of the Registrar. In courses with enrollment limits, priority is given to students registering for credit. Changes to or from audit status must be made before the last day of the add and drop period.

Tuition and fees for audit students are the same as those for students registering for credit.

The audited course will appear on a student's transcript as audited.

**Auditing Master's-Level Courses**

With the permission of the instructor and approval of associate dean for graduate studies of the college/school offering the course, a senior student (90 and above credit hours) with a minimum CGPA of 3.00 can audit a master's-level course in his/her field of study. The student is charged based on the undergraduate tuition structure.

**Graduate Students Auditing Undergraduate-Level Courses**

With the permission of the instructor and approval of the associate dean for undergraduate studies of the college/school offering the course, a graduate student can audit an undergraduate-level course. The student is charged based on the graduate tuition structure.

## Master's-Level Course Registration

With the approval of their associate dean and the relevant associate dean for graduate studies, undergraduate students in their last year of study who have achieved a minimum CGPA of 3.00 can register for up to two master's-level courses while enrolled at the undergraduate level.

Registration is managed through the Office of the Registrar. In courses with enrollment limits, priority is given to graduate students.

Students are charged based on the undergraduate tuition structure.

Unless completed within the context of the Accelerated Master's Program, master's-level courses successfully completed while enrolled at the undergraduate level cannot be counted toward the undergraduate degree program graduation requirements. However, these courses may be counted toward completion of an AUS master's degree program graduation requirements, provided they were completed no more than five years prior to the start date of the first semester of study of the student's current master's degree program.

**Accelerated Master's Program Students**

Undergraduate students accepted to the Accelerated Master's Program (AMP) of an AUS master's-level degree program are eligible to register for a maximum of six credit hours in master's-level courses while completing their undergraduate degree program graduation requirements. Master's-level courses successfully completed while in the AMP may be used towards meeting the undergraduate degree program graduation requirements. These courses may be evaluated for transfer of credit hours towards meeting the master's-level degree program graduation requirements post admission to the program.

For full details on the AMP, including eligibility, application process, course registration and tuition fees, refer to Accelerated Master's Program later in this section of the catalog.

## Independent Study Course Registration

Independent study is the umbrella term used to label two types of independent work: an independent course and directed study.

Students are allowed to take one independent study course. A second independent study, for a maximum total of eight credit hours used toward the graduation requirements of a degree program, could be approved by the student's associate dean.

An independent study should not be used to meet core requirements, foundations year requirements, major requirements, minor requirements, concentration requirements or general education requirements. An independent study can be offered to meet the major electives, minor electives, concentration electives or free electives requirement. An independent study can only be offered in a semester/term that is defined in the academic calendar. For more information, refer to the Independent Study Application form available at www.aus.edu/registration/forms.

Students interested in registering for an independent study course must complete the Independent Study Application form available at www.aus.edu/registration/forms and submit it to the Office of the Registrar during the early registration period of the upcoming semester/term. Registration is handled by the Office of the Registrar.

Tuition and fees for independent study courses are the same as those for other courses.

Independent study courses are graded and appear on the student's transcript.

**Independent Course**
**(1 to 4 credit hours)**

An independent course is an existing course offered in an independent study format. The course is coded using the course number in the catalog. Approved special topic courses can be offered in an independent course format.

Students are not allowed to repeat courses in an independent course format.

To be eligible to apply for an independent course, students must be in good academic standing.

**Directed Study**
**(1 to 4 credit hours)**

A directed study is an investigation under faculty supervision beyond the scope of existing courses. Directed study courses are numbered as 396 or 496. The three-letter course prefix reflects the field of study of the course.

A directed study proposal must be accompanied by a syllabus that provides a description and clearly specified outcomes.

A free elective may be completed as a directed study if a student demonstrates interest and prior preparation in the subject area or related fields.

In order to be eligible to pursue a directed study, students must have completed a minimum of 75 credit hours with a minimum CGPA of 3.00.

## Internship Registration

A number of degree programs at AUS require students to successfully complete an internship. Internships that do not carry academic credit hours are charged a registration fee and are graded as Pass/Fail. Internships that contribute to meeting graduation requirements must be a minimum of five consecutive weeks.

To be eligible to pursue an internship, students should normally have completed a minimum of 75 undergraduate credit hours. A college/school may have a higher minimum credit hours requirement. Approval is granted by the internship coordinator within the college/school.

Students must be registered for internships in the semester/term in which they plan to complete the internship. Internship registration has to be completed by the end of the 20th day of classes of a regular semester and by the end of the second week of classes of a summer term.

Internships are normally completed during the summer before the final year of study. Students pursuing a summer internship may not register for courses during the same summer term. With the approval of the student's associate dean, a student who meets the eligibility requirements may pursue an internship during a fall or spring semester, provided the student's course load in that semester does not exceed seven credit hours.

## Study Abroad Opportunities for AUS Students

AUS offers students the opportunity to study abroad at other institutions during a regular semester and gain full AUS course credit. The International Exchange Office (IXO) aims to provide students the opportunity to immerse themselves in a different culture, to enhance their language skills, to build international work connections and to gain further insight into their field of expertise. With this in mind, students must choose to attend accredited institutions that provide learning experiences similar to those offered by AUS and which meet the following additional requirements:

- The host institution is recognized by the UAE Ministry of Education's Higher Education Affairs Division. Students applying to take online courses must ensure that the host university is also approved for e-learning.
- The host institution is not located in a country the student is a citizen/resident of. Students will be permitted to study in a country in which they hold citizenship/residency provided the total period of residency in the country has not exceeded five years, and no more than two years of secondary education were completed in the intended host country.
- The language of instruction of the course(s) taken at the host institution must be English, except for foreign language courses conducted in other languages. Foreign-language courses may be transferred as free electives. Certified translations of syllabi or other relevant material may be required.
- With the approval of the relevant associate dean, a student pursuing a study abroad experience at colleges and universities recognized by the United States Department of Education's regional accreditation authorities and the UAE Ministry of Education's Higher Education Affairs Division, or at an official AUS exchange partner college/university, may take course(s) at the host university that are taught in languages other than English. Courses taught in languages other than English must be determined to be equivalent in content to AUS courses or approved to meet specific degree requirements (e.g., major electives, free electives, etc.). Certified translations of syllabi or other relevant material may be required.

Of particular interest might be institutions with which AUS has study abroad agreements.

**Requirements**

Students who wish to study abroad during a regular semester must have, at application time, a minimum cumulative GPA of 2.50 and have completed at least 60 credit hours of undergraduate-level courses (excluding credit hours earned in Achievement Academy/Bridge Program courses and preparatory courses).

Contact hours for courses at the host institution must be equivalent to or greater than the contact hours required for equivalent courses at AUS.

Courses taken at AUS cannot be repeated in the context of a study abroad program.

Course prerequisites must be met prior to starting the course at the host institution.

For courses with a laboratory component at AUS, both lecture and laboratory must be taken concurrently at the host institution.

Courses related to areas taught within the School of Business Administration will be evaluated for transfer of credit hours only if completed within institutions that are AACSB or EQUIS accredited, or at universities approved by the School of Business Administration.

Engineering and computer science courses will only be transferred from academic programs recognized by ABET, Inc.

Graduation residence requirements must be met. For details, see Graduation Residence Requirements under Graduation/Graduation Requirements later in this section.

**Application Process**

Interested students must apply online to IXO. Information related to application fees and deadlines is available at www.aus.edu/ixo. Students who are approved by the AUS International Exchange Office will be guided by the office through the rest of the application process. Students should be aware that further admission requirements might exist at the host institution.

Students applying to take online courses as study abroad courses must clearly identify the online courses on the Course Permission Form–Outgoing Students and provide detailed syllabi of these courses.

Students must submit the completed Course Permission Form–Outgoing Students to IXO by the deadlines specified on the application form. The IXO-approved application form must be deposited at the Office of the Registrar by the end of the third week of classes of the AUS summer term for study abroad in a fall semester, and prior to the student's departure for study abroad in a spring semester. Failure to do so will result in no credit being awarded for the work completed abroad.

**Registration**

AUS students who plan to study abroad must register with the AUS Office of the Registrar in addition to registering with the study abroad host institution.

Students taking online courses in addition to regular courses must be registered for all courses with the same host institution.

AUS students studying abroad are not eligible to be enrolled for any type of course work at AUS for the AUS semester overlapping with the study abroad semester.

**Transfer of Credit Hours**

Credit hours earned in study abroad courses will transfer provided the following conditions are met:

- Upon completion of the course(s), the student submits to the AUS Office of the Registrar an official transcript from the host institution demonstrating that the student met the minimum course passing grade requirement, as indicated on the Course Permission Form–Outgoing Students.
- The student had a 2.50 cumulative GPA at the time study abroad courses are taken at the host institution.
- The student had passed the course prerequisites prior to starting the course at the host institution.

Grades earned in courses completed outside AUS do not count in the student's cumulative GPA (CGPA). Credit hours of transferred courses count in the cumulative earned hours and may apply towards meeting graduation requirements.

A maximum total of 30 credit hours may be transferred from institutions where the medium of instruction is not English.

A maximum of six online credit hours can be approved for transfer throughout the student's undergraduate studies at AUS.

At least 50 percent of the required credit hours for a degree must be successfully completed in residence at AUS.

While credit hours will be temporarily transferred, the student will not be awarded his/her bachelor's degree until AUS receives the UAE Ministry of Education's Higher Education Affairs Division verification of the host institution's transcript.

For further information on studying abroad, please contact IXO at ixo@aus.edu.

## Summer/Winter Courses outside AUS

An enrolled student is eligible to apply to take courses at another college/university during the summer or in the period between the fall semester and the spring semester (herein referred to as winter) with the aim of transferring credit hours to AUS. To this end, students must choose institutions meeting the following conditions:

- The host institution is located outside the UAE.
- The host institution provides learning experiences similar to those offered by AUS.
- The host institution is recognized by the UAE Ministry of Education's Higher Education Affairs Division. Students applying to take online courses must ensure that the host university is also approved for e-learning.
- The language of instruction of the course(s) taken at the host university must be English, except for foreign language courses conducted in other languages. Approved foreign-language courses may be transferred as free electives. Certified translations of syllabi or other relevant material may be required.
- With the consent of the relevant associate dean, a student may take course(s) at colleges and universities recognized by the United States Department of Education's regional accreditation authorities and the UAE Ministry of Education's Higher Education Affairs Division, or at an official AUS exchange partner college/university, that are taught in languages other than English. Such courses must be determined to be equivalent in content to AUS courses or approved to meet specific degree requirements (e.g., major electives, free electives, etc.). Certified translations of syllabi or other relevant material may be required.
- The summer term at the host institution must not begin prior to the end of the spring semester examination period at AUS. The winter term at the host institution must not begin prior to the end of the fall semester examination period at AUS.
- The summer term at the host institution must end before the first day of classes of the fall semester at AUS. The winter term at the host institution must end before the first day of classes of the spring semester at AUS.

**Requirements**

Students wishing to take summer/winter courses outside AUS must be in good academic standing at AUS at the time their application is reviewed.

Contact hours for courses at the host institution must be equivalent to or greater than the contact hours required for equivalent courses at AUS.

The summer/winter courses at the host institution must not be taken as attempts to repeat AUS courses.

Course prerequisites must be met prior to starting the course at the host institution.

For courses with a laboratory component at AUS, both lecture and laboratory must be taken concurrently at the host institution.

Courses related to areas taught within the School of Business Administration will be evaluated for transfer of credit hours only if completed within institutions that are AACSB or EQUIS accredited, or at universities approved by the School of Business Administration.

Engineering and computer science courses will only be transferred from academic programs recognized by ABET, Inc.

Graduation residence requirements must be met. For details, see Graduation Residence Requirements under Graduation/Graduation Requirements later in this section.

**Amount of Credit Hours**

For a six-week summer term conducted at a host institution, students may normally transfer no more than two courses where no more than one course can have a lab component.

For summer terms of a different duration and for winter terms, AUS normally allows no more than the equivalent credit hours of the six-week summer term at AUS.

Students may register for more than one summer term between spring and fall semesters with approval of the relevant associate dean(s). Students

may not be concurrently registered in more than one summer term.

A college/school may place further restrictions on the allowable maximum number of credit hours. Students must consult with the relevant associate dean(s) when planning for summer or winter courses outside AUS.

**Application Process**

Prior to registering for courses at the host institution, students must complete the Permission to Take Summer/Winter (Mini-Mester) Courses outside AUS form available at www.aus.edu/registration/forms and submit it to the Office of the Registrar. Forms must be submitted by the end of the 14th week of the preceding spring semester for a summer term and by the end of the 14th week of the preceding fall semester for a winter term. Credit hours will not be awarded if the completed form is not submitted to the Office of the Registrar by the deadlines.

Students applying to take online courses as summer or winter courses outside AUS must clearly identify the online courses on the Permission to Take Summer/Winter (Mini-Mester) Courses outside AUS form and provide detailed syllabi of these courses.

**Registration**

AUS students taking courses outside AUS in the summer are not eligible to be enrolled for any type of course work at AUS for the overlapping AUS summer term.

Students taking online courses in addition to regular courses must be registered for all courses with the same host institution.

**Transfer of Credit Hours**

Credit hours earned in summer/winter courses taken outside AUS will transfer provided the following conditions are met:

- Upon completion of the summer course(s), and before the end of the following fall semester (end of the following spring semester for winter courses), the student submits to the Office of the Registrar an official transcript from the host institution demonstrating that the student met the minimum course passing grade requirement, as indicated on the permission form.
- The student was in good academic standing at AUS at the time summer/winter courses were taken at the host institution.
- The student had passed the course prerequisites prior to starting the course at the host institution.

Grades earned in summer/winter courses completed outside AUS do not count in the student's cumulative GPA (CGPA). Credit hours of transferred courses count in the cumulative earned hours and may apply towards meeting graduation requirements.

A maximum total of 30 credit hours may be transferred from universities where the medium of instruction is not English.

A maximum of six online credit hours can be approved for transfer throughout the student's undergraduate studies at AUS.

At least 50 percent of the required credit hours for a degree must be successfully completed in residence at AUS.

While credit hours will be temporarily transferred, the student will not be awarded his/her bachelor's degree until AUS receives the UAE Ministry of Education's Higher Education Affairs Division verification of the host institution's transcript.

For further information related to transfer of credit hours, please contact the Office of the Registrar.

### Tuition and Fees

For specific information on tuition, fees, payment methods and deferment of tuition and fees, please refer to the Tuition, Grants and Scholarships section later in this catalog.

## Attendance, Withdrawal and Interruption of Studies

### Attendance and Lateness

Attendance and participation in all class, studio, recitation, workshop and laboratory sessions are essential to the process of education at AUS. Students benefit from the lectures and discussions with their instructors and fellow students. For this reason, students are expected to attend class regularly. Lateness or absence hinders progress for the individual and the class and affects the student's grade.

University guidelines for lateness and attendance are as follows:

- Three occasions of lateness count as one absence. Lateness is defined by the individual instructor.
- In the event a student misses 15 percent of the total number of scheduled sessions in a class for any reason, the instructor may initiate withdrawal of the student from the course if a written warning or formal notification was issued when the number of absences reached 10 percent. Students are expected to manage course attendance to ensure that absences due to personal reasons or participation in extracurricular events do not exceed the 15 percent limit. Students who are absent as a result of participation in a university-sanctioned extracurricular event approved by the Office of the Provost must notify the instructors at least two weeks in advance of the event-related absence and, if the requirements of the course allow, instructors are expected to make reasonable accommodations that may include make-up exams or the submission of assignments prior to an absence.
- Stricter attendance requirements may be approved by the relevant dean (or appointed designee) for courses that depend upon student contributions to complete collaborative team-based projects or to prepare for public performances.
- Instructors must specify attendance requirements in the course syllabus. If the syllabus states that missing 15 percent of class sessions will result in withdrawal, then attendance records must be maintained.
- If withdrawal occurs prior to the end of the 10th week of classes (end of the fourth week of classes for a six-week summer term), a grade of W is assigned to the student for the specific course. Beyond the 10th week of classes and up to the end of the 13th week of classes, a grade of WF will be assigned.
- The specific application of the attendance guidelines is at the instructor's discretion.

Students are fully responsible for dropping or withdrawing from courses that they are not attending. Students who register for a course and do not attend may be administratively withdrawn, which will render them ineligible for a tuition refund or adjustment and result in the application of a no-show penalty fee.

### Course Withdrawal

Students may withdraw from courses without grade penalty by submitting the Withdrawal Form (available at www.aus.edu/registration/forms) to the Office of the Registrar. The student must submit the form in person.

Withdrawal from courses must occur no later than the end of the 10th week of classes (end of the fourth week of classes for a six-week summer term). A grade of W will be recorded on the transcript for the course from which the student has withdrawn. A W grade does not impact the student's GPA. The semester/term tuition is not recalculated following course withdrawal.

As of the 11th week of classes and up to the end of the 13th week of classes, a grade of WF will be recorded for those who withdraw from a course. The student will receive 0.00 grade points (F grade) for the WF, and this will be

used in calculating the student's GPA. Students are not eligible to withdraw from courses past the 13th week of classes.

If a student with a documented medical condition (e.g., operation, hospital stay, serious illness, etc.) is withdrawn from a course after the established withdrawal deadline, the student may submit a Student Petition Form (available at www.aus.edu/registration/forms) to the Office of the Registrar with the appropriate original medical documents. The Office of the Registrar will verify the claims and approve the change of status from a WF to a W.

Students are expected to maintain a minimum load of 12 credit hours per semester. Students on AUS financial grants/scholarships must maintain the minimum registration load specified by their grant/scholarship. For more information, refer to the Tuition, Grants and Scholarships/Grants and Scholarships section.

Students are fully responsible for dropping or withdrawing from courses that they are not attending. Students who register for a course and do not attend may be administratively withdrawn, which will render them ineligible for a tuition refund or adjustment and result in the application of a no-show penalty fee.

Instructors may withdraw a student from a course for excessive absence. For details, refer to the section on Attendance and Lateness.

A student may not withdraw from a course in which an academic integrity offense was committed until the case has been reviewed and the adjudication process is complete.

### Withdrawal from the University

Students seeking to withdraw from the university must submit the Complete Withdrawal Form (available at www.aus.edu/registration/forms) to the Office of the Registrar. The student must submit the form in person.

If complete withdrawal occurs during the add and drop period, the courses are dropped and are not recorded in the student's transcript. If withdrawal occurs prior to the end of the 10th week of classes (end of the fourth week of classes for a six-week summer term), a grade of W is assigned to the student for the specific course. In addition, the refund schedule outlined in the table below will apply.

| Withdrawal from the University* |
|---|
| **Before the end of the first week of classes** |
| 100% refund excluding non-refundable deposits |
| **During the second week of classes** |
| 50% refund of tuition |
| **During the third week of classes** |
| 25% refund of tuition |
| **After the third week of classes** |
| 0% refund |

Beyond the 10th week of classes (beyond the fourth week of classes for a six-week summer term), a grade of WF will be assigned.

Students are fully responsible for dropping or withdrawing from courses that they are not attending prior to discontinuing their studies at the university. Students who do not drop or withdraw from courses may be administratively withdrawn, which will render them ineligible for a tuition refund or adjustment and result in the application of a no-show penalty fee. Students in this category who seek to resume studies at the university following interruption of studies must pay all the upcoming semester/term tuition and fees, including charges that resulted from administrative withdrawal from courses.

For retrieval of official documents following complete withdrawal from the university, refer to Students Records earlier in this section of the catalog.

### Interrupted Studies and Reactivation of Student Record

For the purpose of this policy, AUS students studying abroad for a regular semester at an institution with which AUS has a study abroad agreement are considered to be in residence. A summer term abroad at an institution with which AUS has a study abroad agreement is not considered as a term in residence.

**Students Away for One Semester**

- A student in good academic standing is allowed no more than one semester of leave. For the purpose of this policy, a semester of complete course withdrawal is considered as a semester of leave. To resume studies following a one-semester leave, the student must submit a Reactivation Request Form (available at www.aus.edu/registration/forms) to the Office of the Registrar, one month prior to registration.
- Students who are on probation and interrupt their studies by withdrawing from all courses during the semester are not eligible to resume studies at AUS.
- Students who are on probation and take a leave for one semester must petition to resume their studies by submitting the Reactivation Request Form (available at www.aus.edu/registration/forms) to the Office of the Registrar, one month prior to registration. Only with the approval of the student's associate dean and the Director of the Academic Support Center will a student be allowed to resume studies in his/her original major.

**Students Away Longer than One Semester**

- Students in good standing who leave AUS for two or more consecutive semesters, inclusive of a semester of complete course withdrawal, must submit a new application for admission to the Office of Enrollment Management/ Undergraduate Admissions.
- Students who are on probation and interrupt their studies for a period longer than one semester may not apply for readmission. For policies governing academic dismissal, please see the Academic Standing section under Grades and Academic Standing hereafter.

**Transfer of Credit Hours**

Courses taken at another institution while on leave from AUS will not be transferred.

## Course Information

### Course Code

Every course in each discipline or field of study offered by the university is represented by a three-letter prefix denoting the discipline or field of study, followed by a three-digit number indicating the level of the course content, e.g., BIO 260 Genetics and Molecular Biology. Courses of an interdisciplinary nature are represented by the IDS interdisciplinary prefix.

In the BIO 260 example, BIO is the course prefix (which represents biology) and 260 is the course number. This particular course is a sophomore-year course in biology (denoted by the 200 level). This course is more advanced than 100-level introductory courses such as BIO 103 Introduction to Human Biology.

Normally, 100-level course numbers denote first-year-level courses, 200-level course numbers denote sophomore-level courses, 300-level course numbers denote junior-level courses, and 400- or 500-level course numbers denote senior-level courses.

Courses with a 00X number are preparatory courses. They are intended for students with a deficiency in a specific subject matter. These courses

do not count toward meeting a degree program graduation requirements.

In general, courses should be taken in an order of increasing difficulty.

**Reserved Course Numbers**

Certain course numbers denote the course type or the course delivery mode. These numbers are reserved three-digit numbers; the first digit indicates the level of the course and the last two digits indicate the type of the course or the course delivery mode. Reserved course numbers are listed in the following table:

| Course Number | Reserved for |
|---|---|
| x90, x91, x92 | Project courses |
| x93 | AUS courses offered abroad |
| x94 | Special topic courses |
| x95 | Seminar courses |
| x96 | Independent study courses |
| x97 | Internship courses |
| x98 | AUS studio courses offered abroad |

A two-digit suffix is appended to the reserved course number to allow the offering of multiple differentiated sections of the same course type, e.g., ARA 39401, ARA 39402. In this example, 394 indicates a special topic offering; 01 and 02 are the 2-digit suffices differentiating the two offerings.

## Course Credit Hours Definition

All courses are valued in credit hours. Normally, each credit hour represents 50 minutes of class instruction per week each semester, two 50-minute recitation sessions per week each semester, or three 50-minute laboratory sessions per week each semester. Due to the unique nature of labs in different content areas, one credit hour may be assigned for as few as two 50-minute laboratory sessions per week or as many as four.

Design courses, studios, visual and performing arts courses, language courses and project courses may be weighted differently.

The numbers in parentheses following the title of a course indicate the course contact hours' distribution and the course credit hours information. The first digit in parentheses refers to the number of class contact hours per week the course requires, the second digit denotes the number of laboratory or practice hours required weekly, and the third digit refers to the number of credit hours the student will receive upon successfully completing the course. Below is an example:

CHM 101 General Chemistry I (3-3-4)

In this example, CHM 101 has three contact hours per week, three lab hours per week, and the student who successfully completes the course earns four credit hours.

**Note:** *Credit hours earned in preparatory courses do not count toward meeting a degree program graduation requirements.*

## Course Descriptions and Syllabi

Except for special topic courses, interdisciplinary courses, AUS courses offered abroad and independent study courses, descriptions of courses offered by AUS are listed in the Course Descriptions section of this catalog and are also accessible online via the AUS student information system. In the Course Descriptions section of the catalog, courses are grouped by course subject and sorted by course code within the college/school offering them. Descriptions of special topics courses and interdisciplinary courses are made available during registration in the college/school offering the course.

Course syllabi are available from the department or program office. They include course title and course code; pre-requisites (if any) and co-requisites (if any); name, contact information and office hours of the instructor; course description; course outcomes; course schedule; assignments and due dates; assessment methods and the weights assigned to them; and reading material and course texts.

## Course Prerequisites

Many courses above the introductory level require a minimum background of knowledge, as indicated by prerequisite courses cited in individual course descriptions. Titles and numbers are those of AUS courses. Equivalent courses satisfactorily completed at other institutions may also meet prerequisite requirements by transfer credit. Students should consult the head of the appropriate department and the Office of the Registrar for more information.

Students are responsible for having the required competence when entering a class. Courses for which a grade below C- was received do not satisfy prerequisite requirements.

In addition to prerequisites, certain courses also have co-requisites, prerequisites/concurrent and/or other criteria. This information is noted immediately following the description of the course.

## Required and Elective Courses Definitions

In meeting degree programs graduation requirements and requirements of minors of their choice, students are required to complete a set of required and elective courses.

Required courses are courses that are prescribed by the degree program/minor. Students are expected to complete all the required courses identified by their degree program/minor. A choice is sometimes allowed between sets of required courses.

Elective courses are courses selected at the student's discretion, after consultation with their academic advisor. Electives may be selected from a list of courses identified by the program/minor; or are free electives, selected by the student from the course offering of a registration semester/term. Elective courses could also be completed as independent study courses (see Independent Study Course Registration earlier in this section).

## Courses Offerings and Schedules

Courses are offered at the discretion of the department. Students should check with the respective academic departments for information on when courses will be offered.

Except for workshops, language, design, visual and performing arts courses, classes ordinarily meet three days per week in 50-minute sessions or two days per week in 75-minute sessions during regular semesters. Laboratory experiences are normally scheduled for two to three 50-minute sessions once a week. Equivalent meeting time is scheduled for summer terms.

Independent study courses, projects, internships and similar kinds of study opportunities meet according to the special arrangements of the college/school, department or faculty members concerned.

# Fields of Study

## Degree Offerings

American University of Sharjah has four colleges/schools that offer bachelor's, master's and doctoral degree programs. Bachelor's degree programs are listed below. Master's and doctoral degree offerings are listed in the *AUS Graduate Catalog*.

**College of Architecture, Art and Design**

- Bachelor of Architecture
- Bachelor of Interior Design
- Bachelor of Science in Design Management
- Bachelor of Science in Multimedia Design
- Bachelor of Science in Visual Communication

**College of Arts and Sciences**

- Bachelor of Arts in English Language and Literature
- Bachelor of Arts in International Studies
- Bachelor of Arts in Mass Communication
- Bachelor of Arts in Psychology
- Bachelor of Science in Biology
- Bachelor of Science in Chemistry
- Bachelor of Science in Environmental Sciences
- Bachelor of Science in Mathematics
- Bachelor of Science in Physics

**College of Engineering**

- Bachelor of Science in Chemical Engineering
- Bachelor of Science in Civil Engineering
- Bachelor of Science in Computer Engineering
- Bachelor of Science in Computer Science
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Industrial Engineering
- Bachelor of Science in Mechanical Engineering

**School of Business Administration**

- Bachelor of Arts in Economics
- Bachelor of Science in Business Administration with majors in accounting, economics, finance, management, management information systems and marketing

## Major Offerings

Major offerings are determined by the degree offerings. Normally, students declare their major by applying to a particular degree program offered by a college/school. Students applying to the BSBA degree program choose one out of the six majors offered by the program.

A major constitutes the student's main field of study. It requires students to complete a core of courses that are distinctive to that subject area. Students could choose to specialize in a maximum of two majors (see Declaration of a Second Major herein).

Students pursuing a double major will be awarded the degree of their primary major with a notation of their second major added to their diploma (see Degree Information on Diplomas in the Graduation part later in this section of the catalog).

## Undeclared Major Students

Students admitted with an undeclared major must declare a major and secure admission to this major of choice by the end of their sophomore year in order to continue as AUS students.

Students who wish to change major but do not meet the admission requirements of the new major may seek undeclared major status, provided they have earned less than 60 credit hours. To be eligible for continuous enrollment at the university, such students must secure admission to their major of choice by the end of their sophomore year.

Undeclared major students consult with the Academic Support Center for course advising.

To declare a major, the student must submit the Change of Major Form (available at www.aus.edu/registration/forms) to the office of the associate dean for undergraduate studies of the college/school housing the major of his/her choice by the last day of the 12th week of classes of the fall or spring semester. The office of the associate dean will forward the approved forms to the Office of the Registrar. Forms received by the Office of the Registrar after the end of the add and drop period of a semester/term will be effective as of the following semester/term.

A change in major might entail a change in a student's catalog. Please refer to the Change of Major section hereafter and to the Catalog section under Graduation Requirements for more information.

## Change of Major

Students seeking to change their major within their college/school or to change their college/school must complete the Change of Major Form (available at www.aus.edu/registration/forms). Requests for a change of major or change of college/school should be submitted to the office of the associate dean for undergraduate studies of the college/school housing the new major by the last day of the 12th week of classes of the fall or spring semester. The office of the associate dean will forward the approved forms to the Office of the Registrar. Forms received by the Office of the Registrar after the end of the add and drop period of a semester/term will be effective as of the following semester/term.

To be eligible for a change of major, a student must be in good academic standing and must meet the specific requirements for acceptance to the new major. For details on the admission requirements of a major, please refer to the corresponding section under the college/school housing the major or consult with the head of the department housing the major.

A change in major might entail a change in a student's catalog. Please refer to the Catalog section under Graduation Requirements for more information. In addition, students seeking a change of major must consult the graduation requirements of the new degree program, as stipulated in the new student's catalog, to identify specific program graduation requirements for major-designated general education courses, and consult with the college/school to determine how completed courses correspond to the graduation requirements of the new major.

## Declaration of a Second Major

Students may select to enroll in two separate majors. To declare a second major, a student must complete the Minor/Double Major Form (available at www.aus.edu/registration/forms) and submit it to the office of the associate dean for undergraduate studies of the college/school housing the second major by the last day of the 12th week of classes of the fall or spring semester. The office of the associate dean will forward the approved forms to the Office of the Registrar. Forms received by the Office of the Registrar after the end of the add and drop period of a semester/term will be effective as of the following semester/term.

To be eligible for a second major, a student must be in good academic standing and must meet the specific requirements for acceptance to the second major. For details on the admission requirements of a major, please refer to the corresponding section under the college/school housing the major or consult with the head of the department housing the major.

Senior students should declare their second major no later than the end of the 10th week of classes of the semester preceding their graduation semester.

One of the two majors must be designated as the primary major, but the student's rights and responsibilities are the same in both majors. The advisor of the primary major will serve as the student's registration advisor. The student's diploma and transcript will indicate all majors completed at the time of graduation.

For graduation information, please refer to Requirements for a Double Major under the Graduation Requirements section.

## Change of Concentration

Some degree programs offer students one or more areas of concentration. A concentration allows students more in-depth knowledge of a subject area constituting a particular aspect of their major. Please refer to the appropriate degree program section for relevant concentration requirements.

To change a concentration, a student must complete the Change of Major Form (available at www.aus.edu/registration/forms) and submit it to the office of their associate dean by the last day of the 12th week of classes of the fall or spring semester. The office of the associate dean will forward the approved forms to the Office of the Registrar. Forms received by the Office of the Registrar after the end of the add and drop period of a semester/term will be effective as of the following semester/term.

Senior students should declare their choice of concentration(s) no later than the end of the 10th week of classes of the semester preceding their graduation semester/term.

Students approved to declare a concentration that is not listed in their degree program, as described in their catalog of record, but listed in the same degree program as described in the most recent academic catalog will have their catalog of record changed to the first academic catalog where the approved concentration was introduced.

## Minor Offerings

Students interested in pursuing knowledge in a secondary field of study are provided the opportunity to enroll in up to two minors while pursuing their degree program graduation requirements. Conditions apply. For details, refer to Declaration of Minors hereafter.

Listed below are the minors offered by the university. Detailed information about the various minors is given in the catalog section of the college/school offering the minor (refer to the index of this catalog).

**College of Architecture, Art and Design**

- Minor in Design Management
- Minor in Film
- Minor in Illustration and Animation
- Minor in Photography
- Minor in Product Design

**College of Arts and Sciences**

- Minor in Actuarial Mathematics
- Minor in Applied and Computational Mathematics
- Minor in Applied Physics
- Minor in Arabic Language and Literature
- Minor in Biology
- Minor in Data Science
- Minor in English/Arabic Translation
- Minor in English Language
- Minor in English Literature
- Minor in Environmental Policy
- Minor in Environmental Sciences
- Minor in History
- Minor in Integrated Marketing Communications
- Minor in International Studies
- Minor in Journalism
- Minor in Middle Eastern Studies
- Minor in Music
- Minor in Philosophy
- Minor in Psychology
- Minor in Theatre
- Minor in Women's Studies

**College of Engineering**

- Minor in Aerospace Engineering
- Minor in Biomedical Engineering
- Minor in Computer Engineering
- Minor in Computer Science
- Minor in Electrical Engineering
- Minor in Engineering Management
- Minor in Environmental and Water Engineering
- Minor in Mechanical Engineering
- Minor in Mechatronics Engineering
- Minor in Renewable Energy
- Minor in Transportation Systems

**School of Business Administration**

- Minor in Accounting
- Minor in Business Administration
- Minor in Economics
- Minor in Finance
- Minor in Management
- Minor in Management Information Systems
- Minor in Marketing
- Minor in Supply Chain Management

## Declaration of Minors

To be eligible to apply for a minor, students must normally have completed a minimum of 30 credit hours of course work and be in good academic standing. Further requirements might exist. For details, check the catalog section of the college/school housing the minor (refer to the index of this catalog).

A student cannot declare a minor in his/her major field of study. A student cannot pursue more than two minors.

To declare a minor, a student must complete the Minor/Double Major Form (available at www.aus.edu/registration/forms) and submit it to the head of the department or coordinator responsible for the minor by the last day of the 12th week of classes of the fall or spring semester. The approved form will be forwarded to the Office of the Registrar. Forms received by the Office of the Registrar after the end of the add and drop period of a semester/term will be effective as of the following semester/term.

Senior students should declare their minor no later than the end of the 10th week of classes of the semester preceding their graduation semester/term.

A student may drop a minor prior to graduation by submitting the Minor/Double Major Form to the Office of the Registrar no later than the end of the add and drop week of the semester/term of graduation.

Minors are noted on the student's transcript. They do not appear on the diploma.

For information on completing a minor, please refer to Requirements for Minors in the Graduation Requirements section of this catalog.

# Accelerated Master's Program

The Accelerated Master's Program (AMP) offers an opportunity for AUS undergraduate degree-seeking senior students whose goals, academic capabilities and career planning include master's degree work, to complete up to two master's-level courses (for a maximum of six credit hours) while completing their undergraduate degree program graduation requirements. The master's-level courses may be used towards meeting the graduation requirements of both the undergraduate degree program and master's degree program.

The AMP enhances the educational experience of the qualified undergraduate degree program students through advanced knowledge and skills to expand their career opportunities.

Master's-level courses taken as part of the AMP will be charged within the undergraduate tuition and fees structure.

The following master's-level degree programs offer the AMP option:

**College of Architecture, Art and Design**

- Master of Urban Planning

**College of Arts and Sciences**

- Master of Arts in English/Arabic/ English Translation and Interpreting
- Master of Arts in Teaching English to Speakers of Other Languages
- Master of Science in Mathematics

**College of Engineering**

- Master of Science in Biomedical Engineering
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Computer Engineering
- Master of Science in Construction Management
- Master of Science in Electrical Engineering
- Master of Science in Engineering Systems Management
- Master of Science in Mechanical Engineering
- Master of Science in Mechatronics Engineering

**School of Business Administration**

- Master of Science in Accounting
- Master of Science in Finance

## Eligibility

Students interested in pursuing the AMP option must, at application time, meet the following general requirements:

- have achieved a minimum cumulative GPA of 3.50
- have earned a minimum of 90 credit hours (excluding credit hours earned in Achievement Academy/Bridge Program courses and preparatory courses).

Some master's-degree programs might specify additional requirements. For details, please refer to www.aus.edu/amp. Students are also encouraged to consult with the master's-degree program coordinator and to check the relevant degree program section in the *AUS Graduate Catalog*, or contact the Office of Graduate Studies at ogs@aus.edu.

## Application Process

Eligible AUS undergraduate students may apply, during their senior year, for acceptance to the AMP of the AUS master's-level degree program of their interest, by completing the Accelerated Master's Program (AMP) Application Form available at www.aus.edu/registration/forms. The application must be submitted to the coordinator of the master's-degree program. Approved applications are forwarded to the Office of the Registrar, latest by the last day of the add and drop period of a semester/term. Forms received by the Office of the Registrar after the end of the add and drop period of a semester/term will be effective as of the following semester/term.

## Registration

Students accepted to the AMP may register for up to six credit hours in master's-level courses concurrently with their undergraduate degree program requirements.

Students must satisfy the needed background or prerequisites for the master's-level courses they wish to enroll in. The master's-level courses must be approved by the master's program coordinator and by the student's undergraduate degree program/minor, as well as the student's associate dean.

Students must be registered in undergraduate courses during the semester/term they register for a master's-level course.

Students in the AMP cannot register for thesis or graduate professional project credit hours.

Registration is managed through the Office of the Registrar. Students must complete the AMP Course Registration Form (available at www.aus.edu/registration/forms). The approved form must be submitted to the Office of the Registrar by the last day of the add and drop period of the registration semester/term.

Tuition fees are calculated based on the undergraduate tuition fee structure.

## Undergraduate Graduation Requirements

Master's-level courses completed while at the undergraduate level may be used to satisfy the undergraduate degree program requirements towards major/minor/concentration electives and/or free electives, as identified by the student's undergraduate degree program/minor. Consult the online course catalog or the online class schedule accessible via the AUS student information system to view course classifications.

Grades earned in the master's-level courses will be counted in the calculation of the student's undergraduate cumulative GPA.

## Admission to the Master's Program and Transfer of Credit Hours

**Admission to the Master's Degree Program**

Students who are awarded their bachelor's degree from AUS with a cumulative GPA of 3.00 or above and who meet all other master's degree program admission requirements (consult the relevant degree program section in the *AUS Graduate Catalog*) may apply for admission to the master's degree program by completing the regular online graduate application form.

**Transfer of Credit Hours**

Students meeting the master's-level full admission requirements are eligible for transfer of credit hours of master's-level courses successfully completed while at the undergraduate level, provided the Transfer of Credits Hours policy requirements, as stated in the *AUS Graduate Catalog* in effect for the admission semester/term, are met. For details on the current transfer policy, please refer to the Transfer of Credit Hours section under Admission to

Graduate Studies of the *AUS Graduate Catalog.*

Students who do not meet the university's minimum requirements for full admission to master's degree programs are not eligible for transfer of credit hours of master's-level courses completed while at the undergraduate level.

## Graduate Degree Program Residence Requirements

To be awarded the master's degree, students must meet the graduation residence requirements as stipulated in Graduation Requirements/Graduation Residence Requirements of the Academic Policies and Regulations section of the *AUS Graduate Catalog*. In addition, AMP students who later choose the thesis option in the corresponding master's degree program must complete a minimum of three regular semesters in residence at AUS as students of that master's degree program.

# Grades and Academic Standing

## Examinations

Regular and common final examination schedules are published by the Office of the Registrar at www.aus.edu/registration. If a student is scheduled for more than two examinations in one day, more than three examination in two consecutive days, or has a time conflict with common examinations, then the student must report to his/her associate dean by the end of the 11th week of classes to make the necessary adjustments to his/her schedule.

**Failure to Appear for a Final Examination**

A student who fails to appear for the examination will not be permitted to take a make-up examination unless the associate dean for undergraduate studies of the college/school responsible for the course determines that extraordinary circumstances exist and a make-up examination is warranted. The associate dean will then determine whether a make-up examination can be completed as per the make-up examination schedule of the semester/term or an I grade should be awarded and the make-up examination should be scheduled at the beginning of the next semester or summer term. For further details, refer to Incomplete Grades later in this section.

**Illness Prior to and During Final Examinations**

Students are responsible for taking final examinations during the period scheduled by the Office of the Registrar. If an incapacitating illness prohibits taking a final examination, the student must notify the associate dean for undergraduate studies of the student's school/college and provide complete documentation to the University Health Center in advance of the scheduled examination.

Students who begin a final examination are expected to complete it unless a sudden and incapacitating illness requires urgent medical attention. A student whose condition is so serious that medical care is necessary must report immediately to the University Health Center.

If the University Health Center determines that the medical condition prior to or during the scheduled examination period is serious enough to render a student incapable of taking or completing the examination then, based on the recommendation of the University Health Center, the relevant associate dean will determine whether a make-up examination can be completed as per the make-up examination schedule of the semester/term or an I grade should be awarded and the make-up examination should be scheduled at the beginning of the next semester or summer term. For further information, refer to Incomplete Grades later in this section.

The opportunity to complete a make-up examination will not be provided if compelling medical evidence indicates that taking or completing the examination was an option.

**Tardiness**

If an instructor allows a student who arrives late for a final examination to take the examination as scheduled, no additional time beyond the period scheduled by the Office of the Registrar will be provided.

## Grading System

The grade point average (GPA) is based on a four-point scale.

The minimum passing grade for any course taken at AUS is C-.

The following grading system is used at AUS:

| | |
|---|---|
| **Excellent** | |
| A | equals 4.00 grade points |
| A- | equals 3.70 grade points |
| **Good** | |
| B+ | equals 3.30 grade points |
| B | equals 3.00 grade points |
| B- | equals 2.70 grade points |
| **Satisfactory** | |
| C+ | equals 2.30 grade points |
| C | equals 2.00 grade points |
| C- | equals 1.70 grade points |
| **Poor** | |
| D | equals 1.00 grade points |
| **Fail** | |
| F | equals 0.00 grade points |
| **Academic Integrity Violation Fail** | |
| XF | equals 0.00 grade points |
| **Withdrawal Fail** | |
| WF | equals 0.00 grade points |

Grades not calculated in the grade point average are:

| | |
|---|---|
| **AUD** | Audit |
| **AW** | Administrative Withdrawal |
| **I** | Incomplete |
| **IP** | In Progress |
| **N** | No Grade |
| **P** | Pass; credit hours counted |
| **NP** | No Pass |
| **TR** | Transfer; credit hours counted |
| **W** | Withdrawal |
| **WV** | Waive; no credit hours |

The grade appeal process is outlined in the Student Petitions and Appeals section herein.

## Incomplete Grades

The work for a course must be completed by the end of the final examination period of the corresponding registration semester/term. In the case of unexcused incomplete work, an F grade is given for the missing work and the course grade is computed accordingly. Only in exceptional cases, such as a compelling medical or other emergency certified in writing by a medical or other professional, is a student assigned an incomplete grade (I) in a given course (also see Examinations earlier in this section). The instructor of the course will then process an Incomplete Grade Form (available from the office of the associate dean) through the college/school housing the course and submit it to the Office of the Registrar for final approval and implementation. The Incomplete Grade Form must be

submitted within the final examinations period.

An I grade pending beyond the end of the second full week of classes of the next regular semester will revert into either an F grade or the alternative grade indicated by the instructor of the course on the Incomplete Grade Form. It is the responsibility of the student to find out from his/her professor the specific dates by which requirements must be fulfilled.

Prospective candidates for graduation with incomplete grades will be awarded their degrees in the semester/term where their courses are completed.

## In Progress Grades

Project and internship courses could take longer than one semester/term to complete. In this case, the college/school associate dean for undergraduate studies will request that the Registrar enter an In Progress (IP) grade. The request for an In Progress grade must be submitted within the final examination period.

The in-progress work must be completed before the deadline agreed upon with the Registrar, not exceeding the end of the following semester/term. An IP grade pending beyond this time limit will revert into an F grade. It is the responsibility of the student to find out from his/her professor the specific dates by which requirements must be fulfilled.

Prospective candidates for graduation with in progress grades will be awarded their degrees in the semester/term where their courses are completed.

## No Grade Entries

An N grade is assigned to a course when an academic integrity violation has been reported and the adjudication process cannot be concluded before the course grade is due for the semester/term. In such cases, the N grade is temporary and the final grade for the course will be entered once the adjudication process is concluded.

If a violation of the Student Academic Integrity Code or the Student Code of Conduct results in suspension or dismissal effective for the semester/term in which the offense occurred then a No Grade (N) grade will be entered for all courses except for those that were subject to an XF grade penalty. If suspension or dismissal occurs at the end of a regular semester or a summer term and a letter grade has been assigned in a course, the letter grade will revert to an N grade. The Semester GPA and the Cumulative GPA will be recalculated accordingly and a Suspended or Dismissed academic standing will be assigned for the semester/term. For details on transcript notations, refer to Notation of an Academic Integrity Code Violation Penalty under Academic Integrity earlier in this section of the catalog.

## Repeating Courses

A student may repeat any course, pending seat availability, up to two times. In cases of limited seat availability, AUS may give priority to students who have not had the opportunity to take a course for the first time.

During the early registration period, the university reserves the right to drop students who are repeating courses that were previously completed with a grade of C- or above. For violations related to registration, refer to the Student Code of Conduct in the *Student Handbook*, also accessible at www.au.edu/student-handbook.

Students are allowed to repeat a preparatory course up to Sophomore I standing (less than 45 credit hours). Students are allowed to repeat WRI 101 or WRI 102 up to Junior I standing (less than 75 credit hours).

Only the last entry of the repeated course is counted in the calculation of the cumulative GPA.

Students may not repeat AUS courses at another institution with the aim of transferring credit hours.

Students may not repeat courses in an independent course format.

## Class Standing

The class standing of a student in a specific semester/term is determined by the number of credit hours the student has earned up until and excluding that semester/term. The following table summarizes the earned credit hours to class standing equivalencies:

| Credit Hours Earned | Class Standing |
|---|---|
| 0–29 | First-Year |
| 30–59 | Sophomore |
| 60–89 | Junior |
| 90 and above | Senior |

During the period of early registration, the credit hours of the courses in progress are considered when determining the class standing of a student who wishes to enroll in a course with a class standing restriction.

## Grade Point Average

AUS uses two grade point averages: the semester grade point average (SGPA) and the cumulative grade point average (CGPA).

**Quality Points**

The quality points earned in a course are calculated by multiplying the grade point value of the letter grade by the number of credit hours the course is worth. The grades obtained in non-credit courses are not included in the computation of a grade point average.

The grades of preparatory courses count in both the SGPA and the CGPA.

Only the last entry of a repeated course is counted in the calculation of the CGPA.

**Semester Grade Point Average (SGPA)**

The SGPA is the grade point average of grades earned in a particular semester/term. It is calculated by dividing the sum of the quality points of courses taken in a particular semester/term by the total number of credit hours of the courses taken in that same semester/term.

SGPA=sum (quality points of courses taken in semester X)/sum (credit hours of courses taken in semester X)

**Cumulative Grade Point Average (CGPA)**

The CGPA is calculated by dividing the sum of the quality points of courses taken in all semesters/terms by the total number of credit hours of all courses taken in all semesters/terms.

CGPA=sum (quality points of courses taken in all semesters)/sum (credit hours of courses taken in all semesters)

Only the last entry of a repeated course is counted in the calculation of the CGPA.

Students who enroll in the Achievement Academy/Bridge Program prior to admission to the undergraduate level will have the credit hours earned in Bridge Program courses in addition to credit hours earned in preparatory courses taught within the context of the Achievement Academy/Bridge Program counted in the calculation of their undergraduate CGPA.

## Academic Standing

An undergraduate student's academic standing is determined by his/her CGPA.

Matriculated Achievement Academy students start their first undergraduate semester/term in good standing.

**Good Academic Standing**

In order to be considered in good academic standing, an undergraduate student must maintain a CGPA of at least 2.00 out of 4.00.

A student must be in good academic standing to be eligible for graduation.

**Placement on Academic Probation**

All undergraduate students are placed on academic probation at the end of a semester in which the CGPA falls below 2.00. A full-time undergraduate student on Academic Probation 1 is allowed to carry a maximum semester registration load of 16 credit hours. A full-time undergraduate student who is on Academic Probation 2 may only register for a maximum semester registration load of 13 credit hours. Thereafter, an undergraduate student must be in good academic standing (minimum CGPA of 2.00) to continue at AUS.

An undergraduate student who registers for a summer term while on academic probation and who fails to remove his/her academic probation by the end of that summer term will maintain his/her academic probationary status.

Undergraduate students placed on academic probation must sign a contract with the Academic Support Center. Probation students are expected to fulfill the obligations of their probation contract and meet on a regular basis with their Academic Support Center advisor. Students who do not meet all contract obligations may not be able to continue at AUS and will not be granted permission to resume studies following withdrawal from the university.

In addition, undergraduate students who have earned less than 30 credit hours from courses completed at AUS and who are placed on academic probation for the first time are required to successfully complete the university study skills course UPA 200 offered by the Achievement Academy/Bridge Program in the semester/term immediately following placement on academic probation. If the placement on first academic probation with less than 30 institutional credit hours earned happens at the end of a spring semester, students must complete the UPA 200 course in the following fall semester. Students who achieve good standing at the end of the summer term immediately following the semester ending with academic probation and students who have enrolled in the Achievement Academy/Bridge Program prior to admission to the undergraduate level and have completed the university study skills course UPA 100 while in the Academy are exempted from this requirement. For more information, see the section on the Achievement Academy/Bridge Program in this catalog.

**Removal of Academic Probation**

Undergraduate academic probation will be removed at the end of any semester/term in which the student attains a CGPA of 2.00.

**Academic Dismissal**

An undergraduate student who fails to remove his/her academic probation by the end of the second consecutive semester on academic probation, with the academic probationary status maintained at the end of the interim summer term, is academically dismissed and will not be allowed to continue as a student at AUS.

Students seeking reinstatement following academic dismissal must file a Reinstatement Petition form with the Academic Support Center (ASC) prior to the official deadline. The Reinstatement Petition, eligibility criteria for application and submission deadlines are available from the ASC. Reinstatement petitions may be submitted only for the regular semester immediately following the academic dismissal semester. Reinstatement following academic dismissal is granted only in exceptional circumstances.

## University Honors and Awards

**Dean's List**

The Office of the Registrar issues the Dean's List of honor students at the end of each semester. A notation of the Dean's List award is also added to the student's transcript in the corresponding semester. Dean's Lists are not issued for summer terms.

To be placed on the Dean's List in a given semester, a student must satisfy the following criteria:

- registered and earned a minimum of 15 credit hours in gradable (not Pass/Fail) courses in the semester
- achieved a minimum semester GPA of 3.50
- be in good academic standing
- had no failing grades in any of his/her courses for the semester
- had no incomplete grades in the semester
- had no record of sanctions resulting from violations of the Student Academic Integrity Code or Student Code of Conduct for the semester

**Chancellor's List**

Students who have been placed on the Dean's List for both the fall and spring semesters of an academic year are further recognized by the Office of the Provost. These students are placed on the Chancellor's List and are honored during the fall Honors Convocation of the following academic year.

**Graduation Honors**

The university grants Latin honors at graduation. For details on graduation honors, please see Graduation Honors in the Graduation/Graduation Procedures section.

# Student Petitions and Appeals

## Student Responsibility

All official university communications are distributed through the AUS-issued email address. These are considered official notifications. Students are responsible for checking their AUS email accounts and for responding to or acting upon messages accordingly.

Students should keep their own records of all transactions with the university (e.g., registration schedules and forms, grade reports, payment records, etc.). It is also advisable to keep copies of all tests, digital files, papers and so forth submitted in fulfillment of course work. Students should keep copies of all course syllabi.

## Petitions

Students may petition for exceptions to academic policies of the university. Petitions are processed through the Office of the Registrar. The Student Petition Form is available at www.aus.edu/registration/forms.

Registration-related petitions must be submitted to the student's head of department by the first day of the semester/term for which the exception is requested. The office of the associate dean for undergraduate studies will forward the approved petitions to the Office of the Registrar.

## Appeal of a Grade

Students are entitled to objective, professional evaluation of their academic work and to fair, equitable treatment in the course of their academic relationships with members of the faculty. These criteria are observed by the members of the AUS faculty as a part of their professional responsibilities.

A student who believes that he/she has a legitimate concern regarding a final course grade must inform the professor responsible for the course in writing and then discuss the matter with the professor. If a resolution cannot be reached, the student should contact the department head in writing to file a formal grade appeal no later than two working days after the grade has been made available on the student information system. If the matter cannot be resolved at the department level, a grade appeal review will be conducted by a college/school committee appointed by the dean (or appointed designee). Based on the committee's formal recommendation, the dean (or appointed designee) may grant or deny the appeal and notify the student and the professor responsible for the course of the decision. If a change of grade is warranted, the dean (or appointed designee) will inform the Registrar of the grade change.

If a student believes that the grade appeal review by the college/school was affected by procedural errors or the lack of consideration of factors relevant to the case, the student may submit an appeal to the Academic Appeals Review Committee through the Vice Provost for Undergraduate Affairs and Instruction. The student must clearly state the reasons for the appeal and submit all relevant material to the Vice Provost for Undergraduate Affairs and Instruction within five working days from the date of notice of the outcome of the grade appeal review by the college/school. The Academic Appeals Review Committee will consider the case to determine if due process was followed by the college/school and make a formal recommendation to the Provost. The Provost may deny the appeal and notify the student and the college/school of the outcome or, in the event of improper procedure or new evidence, remand the matter to the appropriate dean (or appointed designee) for review at the college/school level.

## Appeal of an XF Grade

In cases where a failing grade of XF was assigned to a course as a result of an academic offense penalty, a student may petition during the semester/term of graduation, or at the time of complete withdrawal from AUS, to have the grade converted to an F on the academic transcript. The petition is submitted to the Office of the Registrar along with the Application for Graduation or the Complete Withdrawal Form. The final decision will be made by the Office of the Vice Provost for Undergraduate Affairs and Instruction.

The F grade resulting from an XF grade will be reverted back into an XF grade if the student reactivates his/her record at AUS.

## Appeal of Other Academic-Related Issues

If a student wishes to discuss an issue pertaining to a course, an instructor or other academic-related issues, the student may direct his/her concern to the head of the department and/or dean of the college/school.

If, in the judgment of the dean of the college/school, the grievance is of such gravity or its resolution would have such impact on the welfare of students generally or on the conduct of professional responsibilities at the university as to require even more formal safeguards for the aggrieved student and faculty member involved, the dean will prescribe an appropriate procedure consonant with the university's mission or refer the matter to the Academic Appeals Review Committee through the Vice Provost for Undergraduate Affairs and Instruction. Academic appeals requests must be submitted no later than the end of the first day of orientation week of the following semester.

# Graduation

## Graduation Requirements

### Catalog

The graduation requirements for any individual student are determined by the catalog that was effective when the student matriculated in the major, referred to as the student's catalog of record. A student may choose to follow the catalog effective for any semester/term in which they were a registered student in their current program of study. To change catalogs, a student must file a Change of Academic Catalog Form (available at www.aus.edu/registration/forms) with the Office of the Registrar no later than the end of Add/Drop period of the student's graduation semester/term.

A student who changes majors may petition to revert to the catalog in effect at the time of matriculation into the university. The Petition Form (available at www.aus.edu/registration/forms) must be approved by the student's associate dean and submitted to the Office of the Registrar no later than the end of the add/drop period of the student's graduation semester/term.

Every individual student is personally responsible for meeting all graduation requirements as detailed in his/her catalog of record.

If a required course within a program changes its number of credit hours, then the number of credit hours required by the program for graduation may, at the discretion of the college/school, change by the same amount provided the minimum total number of credit hours for graduation is 120 and the CGPA is at least 2.00.

In case of substantial changes in course offerings, equivalent graduation requirements are determined by the dean of the student's college/school.

**Disclaimer:** *Course information, content and prerequisites may be subject to change as a result of the university's commitment to a process of continual improvement in academic programs. Students must comply with the most up-to-date course requirements.*

### Courses

Courses are considered primary components of the curriculum and should not be split into individual credit hours to be counted in different areas of the degree audit.

### Preparatory Courses

Preparatory courses are intended for students with a deficiency in a specific subject matter. Credit hours generated by preparatory courses count in the student's earned hours. Grades of preparatory courses count in both the SGPA and the CGPA.

Preparatory courses do not count towards meeting degree program graduation requirements.

### Passing Grade Requirement

The minimum passing grade requirement for a course to meet any area of the graduation requirements and to satisfy any course prerequisites and/or co-requisites is C-.

### General Education Program

**Mission Statement**

Liberal studies form the core component of an AUS education. The General Education Program encourages intellectual discovery and critical reflection, promotes an appreciation of the various modes of human inquiry, and develops the knowledge and skills to succeed in and contribute to the Arab Gulf region and the world at large. The program fosters personal development by providing the foundation for lifelong engagement with the questions that shape individuals and societies. General education at AUS complements professional programs by offering opportunities for students to reflect on a diverse and increasingly interdependent world and their place within it.

**Program Goals and Outcomes**

The General Education Program provides students with opportunities to:

Goal A. Gain an understanding of the history and culture of the Arab World

*Outcomes*

- Explain the literary, artistic or scientific traditions of the Arab world
- Analyze the interdependencies between the Arab Gulf region, the Middle East and the world at large

Goal B. Examine the values and ideas that have shaped the Western intellectual and cultural traditions

*Outcomes*

- Describe intellectual and cultural traditions of the Western world
- Analyze and explain how Western traditions have influenced the present

Goal C. Explore how modes of human inquiry or expression enhances our understanding of culture

*Outcomes*

- Analyze cultural ideals and values in order to enhance self-understanding and empathy for others
- Explain how societies are defined in relation to culture, nationality, race, ethnicity or gender
- Analyze and explain implied and expressed cultural values and attitudes in works of literature (literary perspectives)
- Analyze and explain the development of human institutions, ideas and social structures (historical perspectives)
- Analyze and explain philosophical works that present perspectives on social and cultural issues or problems (philosophical perspectives)

Goal D. Appreciate the roles of creative endeavors in enriching the human condition

*Outcomes*

- Identify, interpret and explain themes in works of literature or art (study of arts/literature)
- Explain how artistic and literary traditions have influenced individuals, cultures or societies (study of arts/literature)
- Demonstrate an understanding of creative processes through the production of works of art or literature (engagement in arts/literature)
- Reflect upon and explain the decisions made during the creative process (engagement in arts/literature)

Goal E. Reflect on the consequences of individual and collective human action

*Outcomes*

- Explain the ways in which individuals, groups, institutions or societies behave and influence one another
- Analyze and describe how social, cultural, political or economic conditions affect individuals
- Analyze and explain human behavior in a variety of contexts
- Assess the ethical dimensions of actions and explain the relationships between individual moral choices and professional responsibility

Goal F. Recognize the value of the natural sciences

*Outcomes*

- Explain how scientific hypotheses are conceived and tested

- Explain how basic scientific concepts are related to contemporary issues

Goal G. Employ quantitative reasoning as a conceptual tool for analysis and description

*Outcomes*

- Analyze data to identify quantitative and qualitative relationships
- Apply basic mathematical concepts
- Demonstrate proficiency in deductive reasoning and problem solving

Goal H. Develop the skills and abilities to thoughtfully seek information, critically analyze sources and clearly formulate complex ideas

*Outcomes*

- Communicate effectively in written English
- Communicate effectively in spoken English
- Evaluate written communication, identify key ideas and establish hierarchies of information
- Structure clear and persuasive arguments based on an analysis and presentation of evidence
- Analyze and explain how culture affects communication
- Identify and access information resources efficiently and effectively based upon the Association of College and Research Libraries standards

Goal I. Investigate how digital technology can facilitate inquiry and the advancement of knowledge

*Outcomes*

- Demonstrate how digital technology can contribute to understanding
- Demonstrate the ability to use digital technology to enhance analysis, description and presentation

**General Education Requirements**

All students must successfully complete a minimum of 39 credit hours in core and non-core general education requirements (GER) with a minimum grade of C- in order to graduate. In addition, students must successfully complete one course from each area of the major-designated requirements. Information on specific courses meeting each of the general education areas is available at https://www.aus.edu/general-education-program.

Students who transfer to AUS may satisfy general education requirements if the course(s) being transferred meet the outcomes of a general education area as defined by the general education program.

*Core Requirements*
*(minimum of 15 credit hours)*

Students must successfully complete a minimum of 15 credit hours in courses meeting the following core general education areas. Credit hours earned in these areas cannot be counted towards other general education requirements or other degree program requirements. Credit hours counted towards a specific core general education area cannot be counted towards another core general education area.

- history and culture of the Arab world: three to six credit hours
- culture in a critical perspective: three to six credit hours
- arts and literature: three to six credit hours
- human interaction and behavior: three to six credit hours

*Non-Core Requirements*
*(minimum of 24 credit hours)*

Students must successfully complete a minimum of 24 credit hours in courses meeting the following non-core general education areas. Courses in these areas may also meet major requirements and program core requirements. In cases where a course is considered both a non-core general education requirement and a major or program core requirement, credit hours for the course are counted only once towards the overall credit hours earned and, in the degree program literature, are included in the total credit hours of the major requirements area or the program core requirements area the course satisfies.

- natural sciences: a minimum of six credit hours
- mathematics: a minimum of three credit hours
- statistics: a minimum of three credit hours (for College of Engineering, please see degree program details)
- communication: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses in this area. WRI 101 Academic Writing I and WRI 102 Academic Writing II should be completed in the first year or before completion of 30 credit hours and cannot be repeated once the student has earned 75 credit hours. Either ENG 203 or ENG 204 can be used to meet the communication requirement.

*Major-Designated Requirements*

Students must successfully complete one course from each of the following areas:

- ethical understanding
- discipline-specific writing intensive course
- oral proficiency
- information literacy
- computer literacy

## Innovation and Entrepreneurship Requirement

All students must successfully complete three credit hours towards the innovation and entrepreneurship requirement. IEN 301 - Innovation and Entrepreneurship Mindset - meets this requirement.

The credit hours earned from IEN 301 cannot be counted towards other degree program graduation requirements.

Students who transfer to AUS may satisfy the innovation and entrepreneurship requirement if the course being transferred meets the outcomes of IEN 301.

## Requirements of a Major

Each student in a degree program must successfully complete at least 36 credit hours in courses that are specific to the major and distinctive to the major subject area. The specific requirements for a major are listed as major requirements, program core requirements, concentration requirements and electives, and major electives, under the corresponding degree program section in this catalog.

Some major requirements and program core requirements may count toward fulfilling non-core or major-designated general education requirements; credit hours of such courses will not double count.

## Requirements for a Double Major

To graduate with a second major, students must satisfy all of the graduation requirements of the degree programs of the two majors requested. Some courses may be counted toward the fulfillment of both degree programs' graduation requirements.

The catalog in effect for the student's primary major will be followed for the degree audit of both degree programs.

Double-major students will be awarded the degree of the primary major degree program, with a notation on the diploma indicating completion of a second major.

## Requirements for a Double Concentration

Certain degree programs offer students the choice of a double concentration. In cases where the two concentrations have common courses, courses used to

fulfill the requirements of the first concentration can double count toward the second concentration.

Because the second concentration is not a degree program requirement, it is considered a free choice of the student. As such, courses used toward the second concentration can double count as free electives.

### Internships

Internships that contribute to meeting graduation requirements must be a minimum of five consecutive weeks. Some degree programs require the internship to be completed over a minimum of 10 consecutive weeks. Internship offerings and requirements are listed under the various degree program graduation requirements.

For information on internship registration, please see Registration and Course Information/Internship Registration earlier in this section of the catalog.

### Free Electives Requirement

To satisfy the free electives requirement, students must successfully complete at least two courses with a minimum of six credit hours. Some degree programs might require more than the minimum of six credit hours. In addition, a college/school may exclude certain courses from being counted as free electives. For more information, please refer to the degree requirements of the corresponding degree program section later in this catalog.

Courses taken to satisfy a double concentration requirement can count towards meeting the free electives requirement.

### Requirements of a Minor

Minor programs consist of a minimum of 18 credit hours. At least 50 percent of the credit hours required for a minor must be in courses at or above the 300 level. At least six credit hours of the courses at or above the 300 level must be successfully completed in residence at AUS. Fifty percent of all credit hours required for the minor must be successfully completed in residence at AUS.

Students must meet the prerequisite requirements for courses required for the minor.

The minimum cumulative GPA for minor courses is 2.00. The specific course requirements constituting a minor are listed in the corresponding college/school section in this catalog (refer to the index of this catalog).

Coursework completed in the context of a summer/winter term outside AUS does not meet the residence requirements.

All courses used to satisfy a degree program's graduation requirements may also be used towards meeting the requirements of a minor. To complete an additional minor, students must satisfy all the requirements of the two minors.

The catalog in effect for the student's major will normally be followed for the audit of the minor. If the minor is not listed in the student's catalog of record, then the first catalog in which the minor is listed will be applied.

Graduation requirements of the minor(s) must be completed prior to the award of the degree.

### Academic Standing Requirement

A student must be in good academic standing to be eligible for graduation.

### Graduation Residence Requirements

Candidates for the bachelor's degree are expected to complete their last semester/term in residence at the university unless registered at an institution with which AUS has a study abroad agreement.

A minimum of 36 credit hours of 300- and/or 400-level course work must be successfully completed in residence at AUS to obtain a bachelor's degree. Coursework at the 300- and/or 400-level completed at an institution with which AUS has a study abroad agreement will meet the AUS upper-level requirement if the courses have been pre-approved by the relevant college/school.

Note that coursework completed in the context of a summer/winter term outside AUS does not meet graduation residence requirements.

Transfer students must successfully complete at least 50 percent of the required credit hours for a degree program in residence at AUS.

### Time Limit on Duration of Study

Regardless of the catalog by which the student's graduation requirements are governed, all degree requirements must be completed within eight years of admission to AUS as an undergraduate student or matriculation from the Achievement Academy/Bridge Program, inclusive of any leave.

## Graduation Procedures and Diploma Information

### Participation in the Commencement Ceremony

The university holds two commencement exercises: a fall commencement ceremony at the end of the fall semester and a spring commencement ceremony at the end of the spring semester.

Prospective candidates for graduation in a fall or spring semester are eligible to participate in the corresponding semester commencement ceremony. Prospective candidates for graduation in a summer term are eligible to participate in the following fall semester commencement ceremony.

Students registered at the 11th week of a semester for courses/project/internship necessary to complete their degree program requirements may participate in commencement at the end of that semester.

Students who do not wish to participate in the commencement exercises of their semester/term of graduation must complete the Absentia Form available at www.aus.edu/registration/forms or www.aus.edu/commencement. Absentia graduates are not eligible to participate in another commencement ceremony.

### Application for Graduation

Candidates for degrees file an Application for Graduation form in the Office of the Registrar in their last expected semester/term of study. The Application for Graduation form is available at www.aus.edu/registration/forms or www.aus.edu/commencement. The deadlines for application submission are published in the academic calendar at the front section of this catalog, as well as at www.aus.edu/commencement. Only after an Application for Graduation form has been filed can the Office of the Registrar begin processing the necessary information for final certification for graduation.

Students who fail to complete all degree requirements by the end of the semester/term for which they apply to graduate need not reapply for graduation. Their previous application will be automatically moved to the following semester/term.

### Conferral of Degrees

Only students who have successfully completed degree requirements by the end of the semester/term for which they have applied to graduate are certified for conferral of a degree.

Conferral of the degree is noted on the academic transcript of the graduate with the date of graduation.

## Names on Diplomas

The names of AUS students will be spelled in English exactly as they appear on their passports or identity cards when printed on diplomas. If a name on a passport or an identity card does not appear in English, then the spelling of the name will be printed according to the personal preference of the student.

## Degree Information on Diplomas

The diploma will list the full name of the degree program awarded, as well as the applicable concentration(s).

The diploma of students graduating with a double major will also list the second major.

Completed minors appear on the student's academic transcript but not on the diploma.

## Graduation Honors

The university grants Latin honors at graduation. To be eligible for graduation honors, students must have achieved the requisite CGPA. These are:

| | |
|---|---|
| Summa cum laude: | 3.90–4.00 CGPA |
| Magna cum laude: | 3.70–3.89 CGPA |
| Cum laude: | 3.50–3.69 CGPA |

Latin honors are noted on the student's diploma and transcript.

## Attestation of Diplomas and Transcripts

The Office of the Registrar provides information relevant to the attestation of diplomas and transcripts with the UAE Ministry of Education's Higher Education Affairs Division. For more information, please visit www.aus.edu/commencement.

# Tuition, Grants and Scholarships

## Tuition and Fees

Tuition for full-time undergraduate students is given in the table below. The full-time course load is 12 to 16 credit hours. Students registering for more than 16 credit hours are charged a supplementary fee for each additional credit hour.

Part-time students are charged per credit hour regardless of their major.

Additional undergraduate fees and housing charges are given in the tables that follow.

Non-degree and transient students must pay the same tuition and fees as regular students.

Tuition and fees of visiting students coming through third-party providers are governed by annual financial agreements. Visiting students applying directly to AUS are charged the same tuition and fees as regular students.

Tuition payment for exchange students attending AUS is governed by the specific terms of the exchange agreement.

The tuition payment of AUS students studying abroad at universities with which AUS has a semester exchange program is governed by the exchange agreement. For details on payment procedures, please check with the International Exchange Office.

AUS students who have received approval to study abroad at a university that does not have a semester exchange program with AUS make their payments directly to their study abroad host university.

AUS reserves the right to revise tuition and fees. Tuition schedules are published prior to the beginning of the fall semester each academic year.

| Tuition (in AED) | | |
|---|---|---|
| | **Regular Semester** | **Summer Term** |
| **Achievement Academy Tuition** | 31,220 | 4,060 per credit hour |
| **Undergraduate Students Registered in All Majors** | | |
| Less than 12 credit hours | 4,180 per credit hour | 4,060 per credit hour |
| 12 to 16 credit hours | 48,070 | - |
| Over 16 credit hours | 48,070 + 3,200 per credit hour exceeding 16 credit hours | - |

| Compulsory Fees (in AED) | | | |
|---|---|---|---|
| **Fee Type** | **Description** | **Regular Semester** | **Summer Term** |
| Seat Reservation Deposit | For all admitted applicants. Non-refundable fee. Deductible from student's tuition if applicant joins AUS in the semester/term of admission. | 5,000 | 5,000 |
| Student Activities | All students | 290* | 145* |
| Health Insurance | **Plan I:** For AUS-sponsored undergraduate students and for undergraduate students who do not have insurance coverage | 600* | 300* |
| | **Plan II:** For all undergraduate students who are ***not*** on Plan I | 300 | 150 |
| Medical Services at University Hospital Sharjah's Primary Care Clinic and Emergency Room | All students | 112.50 | - |

* 5% VAT charge applies

| Conditional Fees (in AED) | | |
|---|---|---|
| Lab/Technology Fee A | Applies for each registered course that has Lab/Tech Fee Rate A noted in its course description | 1,340 |
| Lab/Technology Fee B | Applies for each registered course that has Lab/Tech Fee Rate B noted in its course description | 1,480 |
| UPA 200 Registration Fee | Charged to undergraduate students registered for UPA 200 | 2,500 |
| SBA Software Charge | Charged to SBA courses using a specialized software | 630* |
| Internship Registration Fee | Charged to students registered for a 0-credit hours internship | 200 |

* 5% VAT charge applies

| Student Housing Fees (in AED) | | | |
|---|---|---|---|
| Room Reservation Fee | First-time student residential hall application fee. Non-refundable. Deductible from the student residential hall fees. | | 500 |
| Utilities Service Fee | Fee automatically added to any reserved residential hall room (except in summer) | | 290* |
| Refundable Dorm Maintenance Deposit | One-time fee applied when students first register for residential halls–refundable after cancelation | | 1,000 |
| **Room Type** | **Description** | **Regular Semester** | **Summer Term** |
| **Private** | Single occupancy with private bath and kitchenette | 17,230 | 6,890 |
| **Semi-Private** | Single occupancy with a shared bath and kitchenette | 12,200 | 4,880 |
| **Sharing** | Double occupancy with a shared bath and kitchenette | | |
| | All students except undergraduate degree-seeking students in their first two semesters of study at AUS | 9,280 | 3,710 |
| | Undergraduate degree-seeking students in their first two semesters of study at AUS | 2,000 | 3,710 |
| **Single** | Single occupancy with a common bath and no kitchenette (men only) | 6,430 | - |
| **Double** | Double occupancy with a common bath and no kitchenette (men only) | 3,740 | - |

* 5% VAT charge applies

| Fines/Charges (in AED) | |
|---|---|
| Late Registration | 500* |
| Late Payment (if tuition and fees are not settled by the first due date) | 500* |
| Reinstatement Fee (if fees are not settled by the second due date) | 1,500* |
| Returned Check Penalty (per check, if returned by bank) | 500* |
| Declined Credit Card (per transaction for deferred payments, if credit card is declined upon charging) | 500* |
| No-Show Penalty (if a student does not show up for one or more registered courses) | 1,500* |

* 5% VAT charge applies

## Payment Methods

Tuition and fees are due each semester at or before the time of registration and form an integral part of registration. For information on the deferment of tuition and fees, please see the Deferment of Tuition and Fees section below.

AUS accepts the methods of payment listed below. For the updated payment terms of a specific semester/term, please consult the published payment guide of the relevant semester/term (available at www.aus.edu/payment-guide).

- cash in UAE Dirhams (AED) only
- checks drawn on local banks in UAE Dirhams (If two or more checks return due to insufficient funds, checks will no longer be accepted.)
- credit cards (including online payment)
- direct transfers to Sharjah Islamic Bank Account No. 0011-200170-001, IBAN number: AE02 0410 0000 1120 0170 001 (student's name and ID number must be noted on transfer)
- direct cash deposit at Al Ansari Exchange (student's name and ID number must be noted on the transfer)

A charge of AED 500 + 5% VAT is added if a check is returned for insufficient funds or if a credit card authorization payment is declined.

All student financial transactions with the university are processed through the Student Accounts Office located on the mezzanine floor of the Main Building. Questions concerning student accounts should be directed to the Student Accounts Office by calling 515 2282/515 2039 or sending an email to studentaccounts@aus.edu.

## Deferment of Tuition and Fees

Students are expected to pay their tuition and fees or to make arrangements for deferred payment during the registration period. The deferment of tuition and fees is approved only if all of the following conditions are met:

- 60 percent of the tuition and fees have been paid by the payment deadline.
- The student does not have access to checks or credit cards.
- The student has a clean payment history.
- The Fee Deferment Request Form is completed and signed by the student and is authorized by a Finance Department official.

## Late Fees and Fines

All university students must adhere to university deadlines, rules and regulations. Late fees and fines, with 5% VAT if applicable, may apply for late book returns, parking violations, breakage, late registration, late tuition payment, etc.

# Grants and Scholarships

AUS offers a number of grants and scholarships to support Achievement Academy Bridge Program students and undergraduate degree-seeking students.

Decisions related to the award of grants and scholarships are made irrespective of race, color, gender, religion, disabilities, age or national origin.

For more information, please contact the Office of Financial Grants and Scholarships, located on the mezzanine floor of the Main Building, at 515 2055/2060/2072/2005 or visit www.aus.edu/grants_scholarships.

**Applications and Renewal Forms**

Applications and renewal forms can be downloaded from the Office of Financial Grants and Scholarships website at www.aus.edu/grants_scholarships.

Application and renewal forms, along with all required supplementary material, must be submitted by the deadlines published on the Office of Financial Grants and Scholarships website.

Some grants/scholarship do not require submission of an application or a renewal form. For details, refer to the specific grant/scholarship section.

**Custody of Records**

All documents submitted at the time of applying for a scholarship/grant or renewing an application for scholarship/grant are the property of AUS and, as such, are part of the student record that is under the custody of the Office of Financial Grants and Scholarships. The university is not required to provide (or allow the making of) copies of these documents. The university Student Privacy Rights policy applies. For details, please refer to the specific policy text in the Student Records section earlier in this catalog.

**Time Limit on Grants/Scholarships**

Provided continuation conditions are met, AUS grants and scholarships are normally awarded for a maximum period of eight semesters from the time of matriculation into the university as an undergraduate degree-seeking student. They are provided for 10 semesters for students in degree programs offered by the College of Engineering and 11 semesters for students in the Bachelor of Architecture degree program.

Grants and scholarships are provided for a maximum of two semesters of study in the Achievement Academy Bridge Program.

Some grants/scholarships may be provided for shorter time periods or be semester specific. For details, refer to the specific grant/scholarship section.

**Maximum Award for Grants/Scholarships**

Students are allowed to receive grants/scholarships from AUS as well as external sponsorships/scholarships. However, the total amount received from AUS and/or from external sponsorship/scholarship cannot exceed 100 percent of the amount of tuition for a given semester or term.

## Grants

**Family Tuition Grant**

Families with more than one child simultaneously enrolled at AUS are eligible for a family tuition grant whereby a tuition discount of 25 percent is accorded to each sibling after the first. The 25 percent discount is granted for both tuition (for a maximum of 16 credit hours) and lab/technology fees. The following conditions must be met:

- siblings are enrolled in a regular semester as full-time undergraduate degree-seeking students or as Achievement Academy/Bridge Program students
- siblings are enrolled in a summer term in credit-bearing courses

Eligible students must complete the Family Tuition Grant Application form available at www.aus.edu/grants_scholarships and submit it to the Office of Financial Grants and Scholarships by the end of the first week of classes.

The family tuition grants are awarded at the end of the add and drop period of the given semester/term, provided the full-time enrollment condition is met.

**Financial Grant**

AUS provides need-based financial grants for full-time students who demonstrate financial need as determined by the Office of Financial Grants and Scholarships.

A financial grant normally applies toward tuition for a maximum of 16 credit hours. Students on financial grant who live on campus in single, double or sharing rooms are granted partial assistance toward their residential hall fees.

A financial grant is normally awarded in a regular semester for two consecutive semesters. New and returning students joining AUS in a summer term could be awarded a financial grant in that summer term, provided eligibility conditions are met. The financial grant of enrolled students may apply to AUS summer terms, provided the student was on financial grant in the spring semester of the same academic year and is registered in credit-bearing courses for the summer term.

For information on eligibility for the initial award and maintaining a financial grant, see the Office of Financial Grants and Scholarships website at www.aus.edu/grants_scholarships.

**Study Tour Grant**

Students receiving a minimum of 25 percent financial grant from AUS and enrolled in a credit-bearing study tour are eligible to apply for funding that can be used to supplement tour costs.

The study tour grant application form is available from the International Exchange Office or the Office of Financial Grants and Scholarships. The form must be received by the Office of Financial Grants and Scholarships at least four weeks prior to the commencement of the study tour.

## Scholarships

**Scholarships for First-Time Students**

First-time students who demonstrate academic excellence in at least two of the last three years of their secondary education or in the final year of their secondary education may be eligible for a **Merit-Based Scholarship**.

In addition to merit-based scholarships, AUS offers the **Chancellor's Scholars Award** for highly qualified first-time students who demonstrate financial need as determined by the Office of Financial Grants and Scholarships. The Chancellor's Scholars Award cannot be combined with a financial grant, a Merit-Based Scholarship or a Family Tuition Grant, but can be combined with all other scholarships offered by AUS.

Partner Sharakah program schools can nominate exceptional first-time students from their school for a **Sharakah School Scholarship**. Applicants who demonstrate financial need as determined by the Office of Financial Grants and Scholarships will be given priority. The Sharakah School Scholarship cannot be combined with a financial grant, a Merit-Based Scholarship or a Family Tuition Grant, but can be combined with all other scholarships offered by AUS.

For information on scholarships for first-time students, see the Office of Financial Grants and Scholarships website at www.aus.edu/grants_scholarships.

**Scholarships Recognizing Students on the Dean's and Chancellor's Lists**

Subject to available budget, students placed on the Dean's and Chancellor's Lists at the end of the fall or spring semesters are eligible for a scholarship.

Application forms are not required. The **Dean's List Scholarship** and **Chancellor's List Scholarship** are awarded during the third or fourth week of classes of the fall and spring semesters; they are not available in the summer.

For information on the Dean's List Scholarship and Chancellor's List Scholarship, see the Office of Financial Grants and Scholarships website at www.aus.edu/grants_scholarships.

**Scholarships for Continuing Students Excelling in Extracurricular Activities and Athletics**

AUS offers the following scholarships to continuing degree-seeking students who excel in extracurricular activities and athletics:

- Active Student Scholarship
- Most Outstanding Active Student Award
- Most Outstanding Athlete Award
- Most Outstanding Community Services Volunteer Award
- Most Outstanding Student Leader Award
- Partial Athletic Scholarship

For information on scholarships for extracurricular activities and athletics, see the Office of Financial Grants and Scholarships website at www.aus.edu/grants_scholarships. Students interested in applying may contact the Office of Student Affairs or email studentaffairs@aus.edu.

**Endowed Scholarships**

AUS offers a number of need-based endowed scholarships, which have been made possible through generous contributions from individuals and organizations. Students who receive a financial grant from AUS (see Financial Grant earlier in this section) and fulfill the criteria for a particular need-based endowed scholarship will be considered. Students selected for an endowed scholarship will be notified by the Office of Financial Grants and Scholarships.

The **Petrofac Endowment Scholarship** provides assistance for junior and senior students in the College of Engineering who have limited financial resources and who demonstrate academic excellence and exemplify the hallmark traits that characterize American University of Sharjah: honor, integrity, leadership and service to others.

The **Sheikh Khalifa Scholarship**, awarded to juniors and seniors, recognizes academic excellence, leadership potential, service to community, demonstrated talent in the field of study, and participation in extracurricular and university activities.

For information on Endowed Scholarships, see the Office of Financial Grants and Scholarships website at www.aus.edu/grants_scholarships.

### AUS Students on International Exchange Programs

AUS students on grants/scholarships must obtain approval from the Office of Financial Grants and Scholarships before starting a semester abroad at a host university.

In cases where the AUS student pays tuition and/or housing fees directly to AUS for study abroad, the student will continue to use his or her AUS grants and AUS-funded scholarships for that semester abroad. Students receiving a minimum of 25 percent financial grant may also have the cost of the meal plan covered.

In all other cases of students studying abroad, grants and AUS-funded scholarships will not be awarded.

### Appeal of a Financial Grant/Scholarship

Students who have exceeded the maximum number of semesters or who are facing extenuating financial circumstances may submit an appeal clearly explaining the situation by email to scholarship@aus.edu. Appeals must be received one week prior to the beginning of the semester/term for which the exception is requested.

## Sponsorship Liaison Services

Sponsorship Liaison Services is the main link between external organizations and their sponsored AUS students. Sponsorship Liaison Services provides various support services to both the sponsoring organizations and sponsored students, including coordinating admission and orientation, communicating progress reports, offering guidance, coordinating financial-related matters with the AUS Finance Department, and arranging for meetings between sponsors and students.

For more information, please contact Sponsorship Liaison Services at +971 6 515 1111, submit a query on infodesk.aus.edu or visit www.aus.edu/sponsorship-liaison-services.

# College of Architecture, Art and Design

**Dean**

Varkki Pallathucheril

**Associate Dean**

Zinka Bejtic

The College of Architecture, Art and Design (CAAD) is committed to providing a comprehensive education that will enable its graduates to make significant contributions to the Gulf region and the broader global community through conscientious participation in practice.

All its undergraduate programs have received accreditation from the UAE Ministry of Education's Higher Education Affairs Division. The Bachelor of Architecture program is further accredited by the National Architectural Accrediting Board (NAAB) of the United States.

The College of Architecture, Art and Design grounds its curriculum in the conviction that good design results from a combination of a deep understanding of culture, ethical engagement in society and a respect for the creative skills needed to build a sustainable material culture.

Against this background, the college is committed to the primary objective of providing its students with relevant, professional instruction in the fields of architecture, design management, interior design, multimedia design and visual communication.

The college is dedicated to inquiry and to the development of hands-on technical skills and competence in digital and other advanced media. It also fosters in its students a regional and cultural awareness and the responsibility for creating humane environments. The college seeks to contribute to the development of professional standards and innovation in architecture and design.

The College of Architecture, Art and Design meets its objectives through degree programs that feature the following:

- an environment that encourages achievement and personal growth
- a faculty of professionals who balance continuing scholarship and creative work with their desire for excellence in teaching
- an advising and student counseling system that tracks student development and progress
- a general education curriculum that offers a solid foundation
- a clear and consistent approach that is evident throughout the curriculum
- a variety of courses that are continually updated to reflect rapidly changing design practices and the growing role of digital communication
- a respect for culture, traditions and needs of society

## Degree Programs

CAAD offers the following undergraduate degree programs:

- Bachelor of Architecture
- Bachelor of Interior Design
- Bachelor of Science in Design Management
- Bachelor of Science in Multimedia Design
- Bachelor of Science in Visual Communication

CAAD also offers a Master in Urban Planning degree program. For details, please refer to the *AUS Graduate Catalog*.

## Minor Offerings

CAAD offers the following minors:

- design management
- film
- illustration and animation
- photography
- product design

Details on each minor are provided in the Department of Art and Design section later in this part of the catalog.

## Career Opportunities

CAAD prepares students for careers in a wide variety of fields:

- architecture, environmental design, interior design, urban design, urban planning
- graphic design, advertising, packaging design, illustration, digital media, animation, computer simulations, video, photography, printmaking
- communications and public relations, fine arts and cultural arts administration, gallery management, advertising campaign planning

## Special Notes

**Space Availability in Studio Majors**

Admission to the studio majors (architecture, interior design, multimedia design and visual communication) in the College of Architecture, Art and Design is competitive. The number of available seats in second-year studio majors is limited to the following:

- architecture 48
- interior design 16
- multimedia design 16
- visual communication 16

Students are formally admitted to their studio major if they are selected to advance to second-year of that major. Selection for advancement to the second-year studios is competitive. Minimum requirements for formal admission consideration are detailed in the catalog section of the degree program of each studio major.

**Year Status for Studio Majors**

Year status in the College of Architecture, Art and Design is determined by enrollment in the major studio, regardless of the total number of credit hours earned.

**Computer Requirements**

At the beginning of the third year for students in the studio majors and before taking DES 300 for students in design management, students are required to have a personal laptop computer. The laptop must meet the minimum specifications determined by CAAD and communicated to the students every year. Laptops that do not meet these minimum specifications may not adequately run software required to complete course work.

**Course Selection**

Students are cautioned that the specific selection of courses available for a chosen major at the time of initial registration is subject to change. The College of Architecture, Art and Design will make every effort to monitor student progress through the advisement process; however, students are responsible to make course selections based on the stated degree requirements, subject to the listed prerequisites.

**Studio Supplies**

Supply expenses for studio courses are in addition to tuition fees, and lab fees may apply for some courses. However, students are given a limited account for printing and plotting large-format drawings.

**Ownership of Student Work**

The College of Architecture, Art and Design reserves the right to retain indefinitely selected examples of student work for archiving, publicity and exhibition. Students are highly

advised to document their work before submission.

**Responsibility for Equipment**

The College of Architecture, Art and Design provides an extensive range of digital media equipment and power tools for student use. For some courses, college equipment is checked out to a student or a group of students for use on or off campus. Students are expected to treat college equipment with care and will be held financially responsible for breakage, damage, late return or loss.

## Foundations Year

W. Eirik Heintz, Director

The foundations year is an autonomous one-year program that supports the common educational requirements for all fields of study within the College of Architecture, Art and Design. As such, the program provides the basic design education that will enable students to function on appropriate practical, theoretical and critical levels in their sophomore (second) year.

The foundations year aims to achieve three instructional objectives:

- competence in the fundamental skills and concepts of design analysis, representation and presentation through studio-based exercises and projects
- familiarity with the historical implications and chronology of design conventions through in-class lectures and written assignments
- a basic proficiency in analog and digital technologies through exercises and projects that are integrated within the studio context

The foundations year utilizes three distinct teaching formats in order to provide a broad and inclusive introduction to design methods and practice. Studio courses, which form the core of the foundations year, encourage one-on-one student/professor interaction and allow the student to develop an independent design process. History courses are taught in a lecture context where information and ideas are disseminated in a classroom setting using visual images to support learning. Professors interact with students on various levels through the use of traditional lectures, digital media, network software and digital storage systems.

Within the foundations year, students are encouraged to develop a basic practical and critical understanding of design principles. Experimentation and exploration with materials, tools and techniques are fostered in the realization of two- and three-dimensional concepts and ideas.

Foundations year courses are taught by professors from all the fields of study in the College of Architecture, Art and Design. This professional collaboration between disciplines at the foundations level initiates early student dialogue with senior-level faculty and provides the program with a healthy influx of cross-disciplinary expertise and discourse. It is this important aspect of the foundations year program that ensures a balanced response to the needs of the various degree programs it supports.

The foundations year consists of the following courses:

- DES 111 Descriptive Drawing I
- DES 112 Descriptive Drawing II
- DES 121 Introduction to Architecture, Art and Design History
- DES 122 Modern Developments in Architecture, Art and Design
- DES 131 Design Foundations I
- DES 132 Design Foundations II

All College of Architecture, Art and Design students in studio majors are required to successfully complete the foundations year courses to be considered for formal admission to their chosen studio major. Foundations year courses are major requirements in all studio majors.

Design management students must complete DES 111, DES 131 and either DES 121 or DES 122.

The foundations year studio courses DES 111 and DES 131 cannot normally be repeated. If a student is in good academic standing and there are extenuating documented circumstances that impacted performance in DES 111 or DES 131, then a request to repeat can be reviewed if the student submits a petition to the Director of Foundations Year by the last day of classes of the spring semester of the academic year when the course was attempted. The decision to approve a repeat of DES 111 or DES 131 will be based on an evaluation of the student's academic performance and an assessment of the ability to successfully compete for advancement to the second year at the conclusion of the academic year within which DES 111 or DES 131 will be repeated.

DES 112 and DES 132 are not repeatable.

## Department of Architecture

George Katodrytis, Head

**Faculty**

Jason Carlow
Roberto Castillo
Camilo Cerro
Daniel Chavez
Igor Curiel
Brian Dougan
Marcus Farr
W. Eirik Heintz
Michael Hughes
Ammar Kalo
Jerry Kolo
Kevin Mitchell
Ahmed Mokhtar
John Montague
George Newlands
Maria Oliver
Varkki Pallathucheril
Rafael Pizarro
Patrick Rhodes
Juan Roldan
William Sarnecky
Gregory Spaw
Faysal Tabbarah
Tania Ursomarzo
Gregory Watson

### Bachelor of Architecture (BArch)

Architecture arises from the same wellspring of civilization as other universal manifestations of material culture: arts, histories, letters, religion and commerce. Still, the artifacts designated as architecture possess a scale, permanence and a pervasive influence unique among human endeavors. These qualities endow the discipline with a cultural prominence few other professions enjoy.

In its contemporary university setting, the study of architecture is naturally concerned with complex, interdisciplinary issues. Some matters are primarily individual and practical: the basic human need for shelter and the desire to contrive efficient, adequate forms for the patterns of daily life. Architecture, in this sense, may concern aspirations and meanings, but its primary intent is to attain a practical advantage here and now.

Architecture also has a transcendent motive, arising from an imperative to articulate, physically and spatially, the social, ceremonial and environmental choices a given culture makes within a given setting. Architecture expresses living values. It gives abiding form, order and proportion to activities. Architecture is a message to the world about

certainties and doubts, values and beliefs, preoccupations and neglects. It both expresses and reveals.

The practice of architecture today, as in the past, requires coordinated contributions from multiple fields. The craft of the architect runs a gamut of expertise and awareness: technical, environmental, aesthetic, cultural, historical and commercial. Consequently, the study of architecture investigates principles and applications of technology, art, humanities, engineering, physical and social sciences, business and management. Architectural design, finally, is the synthetic practice that links and gives significant form to these interdisciplinary contributions.

**Program Goals**

The Bachelor of Architecture degree program aims to:

- provide students with a comprehensive understanding of the historical and theoretical forces that shape architecture
- prepare future architects to make contributions to improving the built environment through leadership, personal engagement and professional practice while respecting human diversity and adhering to ethical standards
- provide students with the knowledge and skills necessary to conceive, develop and communicate complex design proposals
- foster critical thinking and cultivate an approach to design that values the role of research, analysis and experimentation
- promote a critical understanding of building technologies and their impact on the built environment

**Program Outcomes**

Upon completion of the Bachelor of Architecture degree program, graduates should be able to:

- explain design principles in relationship to the history and theory of architecture
- demonstrate an understanding of the standards of professional practice
- demonstrate an understanding of the conventions of building systems and technology
- employ traditional means of representation, computer-aided design, digital and physical modeling and fabrication to develop and communicate design
- articulate, present and discuss design proposals in verbal, written and graphic form
- employ research, analysis and iterative processes to inform and enrich the process of design
- employ research, analysis and problem-solving skills to address unique and fluctuating conditions of design
- integrate materials, construction methodologies, site conditions and environmental control systems into a comprehensive building design proposal
- analyze and explain the relationship between design and environmental sustainability
- demonstrate the ability to independently develop design proposals that respond to context
- work in teams to conduct research on design-related issues and present results in verbal, written and graphic form

## Accreditation

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit US professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture and the Doctor of Architecture. A program may be granted an eight-year, three-year or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

The American University of Sharjah College of Architecture, Art and Design offers the following NAAB-accredited degree program:

BArch (159 undergraduate credit hours)

## Curriculum

The BArch degree program (five-year professional program) is intended for the student seeking a professional career in architecture. The program entails a minimum of five years of university studies plus professional training. A minimum of 159 credit hours comprise the degree program, including a minimum of 102 credit hours of required course work in architecture and closely associated fields. These courses represent the irreducible core of the discipline of architecture.

The specialized professional curriculum is supported by a minimum of 39 credit hours of general education requirements. Designed to ensure a broad educational foundation, this base is held in common among all graduates of American University of Sharjah.

University studies present a unique opportunity to explore other fields of interest. Based solely on individual interests, each architecture student must select a minimum of 15 credit hours of free electives from general university offerings.

The curriculum is designed to meet the requirements for licensure that prevail in the United Arab Emirates and to prepare the graduate for professional practice throughout the region. Some students may aspire either to advanced study in the field or to practice in a broader global setting. Accordingly, the curriculum follows established international norms for a first professional degree in architecture.

## Formal Admission to the Program

The number of seats in architecture is limited. Formal admission is competitive. Only the most highly qualified foundations year students will be admitted. To be considered for formal admission to the Bachelor of Architecture program a student must successfully complete the following minimum requirements:

- all four foundations year studio courses (DES 111, DES 112, DES 131, DES 132) with a minimum grade point average (GPA) of 2.00 out of 4.00 in each sequence (Descriptive Drawing and Design Foundations)
- DES 121 Introduction to Architecture, Art and Design History and DES 122 Modern Developments in Architecture, Art and Design
- MTH 111 Mathematics for Architects or its prerequisite (MTH 003), or MTH 103 Calculus I
- at least one course in writing (WRI) at the 100 level or above
- a minimum of 27 undergraduate credit hours (credit hours earned including the above courses)
- a CGPA of 2.30

In addition, selection for formal admission may also include portfolio review.

Formal notification of admission will be announced by the College of Architecture, Art and Design by the first week of the summer term after the release of the final grades by the Office

of the Registrar at the end of the spring semester.

In the event that there are more students who qualify for formal admission than available seats, candidates will be admitted based on academic achievement, and a waiting list will be established. However, if there are fewer students who qualify for formal admission than available seats, consideration will be given to students who have applied for a change of major. If seats are still available at the time of fall registration, consideration will also be given to students who fulfilled requirements during summer term. The same formal admission criteria apply.

Only students formally admitted to the major are eligible for registration in the second-year studio course.

**Note:** To repeat a second-year studio course, students must compete for the limited number of seats in second-year studio courses based on the criteria for formal admission to the program.

## Advancement Reviews

The performance of each architecture student is reviewed following the completion of each of the second, third and fourth years in the program. Only the students who have attained a minimum CGPA of C+ (2.30) at the time of the review are eligible to advance to the following year studio.

A student who does not attain the required CGPA will be required to meet with the head of the department.

A student who fails an architecture studio twice is dismissed from the program.

## Degree Requirements

To qualify for graduation with a BArch degree, students must successfully complete the following minimum requirements:

- a minimum of 159 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 102 credit hours of major requirements
  - a minimum of 15 credit hours of free electives
  - five weeks of an approved internship
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

Please see the proposed sequence of study for information on completing the requirements in five years.

**General Education Requirements (minimum of 39 credit hours)**

Students in the BArch degree program must successfully complete the following general education requirements:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement, including PHY 104 and excluding ARC 354
- mathematics requirement: MTH 103 or MTH 111
- statistics requirement: a minimum of three credit hours in courses meeting this requirement
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level or above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through ARC 463
- discipline-specific writing intensive course requirement: satisfied through ARC 421
- oral proficiency requirement: satisfied through ARC 401-01
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through ARC 201

For complete information on general education requirements, please refer to the Graduation Requirements section within the Academic Policies and Regulations section of this catalog.

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (102 credit hours)**

In addition to the foundations year courses, the following courses constitute the major requirements for the BArch degree program:

- ARC 201 Architectural Design Studio I
- ARC 202 Architectural Design Studio II
- ARC 221 Pre-Modern Architecture and Urban Form
- ARC 222 Modern Architecture and Urban Form
- ARC 232 Materials and Methods I
- ARC 271 Introduction to Landscape
- ARC 281 Architectural Principles
- ARC 301 Architectural Design Studio III
- ARC 302 Architectural Design Studio IV
- ARC 331 Materials and Methods II
- ARC 342 Structures for Architects
- ARC 382 Architectural Detailing
- ARC 397 Internship in Architecture
- ARC 401-01 Architectural Design Studio V
- ARC 402 Architectural Design Studio VI
- ARC 421 Architectural Theory
- ARC 451 Environmental Control Systems
- ARC 463 Professional Practice
- ARC 501 Architectural Design Studio VII
- ARC 502 Architectural Design Studio VIII or
  ARC 592 Directed Architectural Design Studio
- ARC 581 Critical Practice and Contemporary Discourse

*Directed Architectural Design Studio (ARC 592)*

Normally, registration in ARC 592 requires completion of ARC 591. However, approval may be granted to continue work initiated in ARC 501 as an independent project in ARC 592. A minimum cumulative GPA of 3.30 and a minimum GPA of 3.50 in the upper-level studio sequence (ARC 301, ARC 302, ARC 401-01, and ARC 402) is

required to apply to register in ARC 592 following the completion of ARC 501.

Permission to register in ARC 592 will be evaluated by the department based on a written proposal and an evaluation of studio work completed in ARC 501 or research work completed in ARC 591. Students who have not completed ARC 591 must consult with the department regarding proposal criteria and must submit all required material by the last day of exams during the semester in which they have completed ARC 501.

*Internship*

To qualify for graduation with a BArch degree, students must fulfill the internship requirement. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting.

The internship consists of a minimum of 200 work hours for third-year or fourth-year students with an approved employer. Students' internships are ultimately evaluated by the internship coordinator with a Pass/Fail grade. Architecture students are highly encouraged to complete the internship program during the summer following their third year.

For details on internship eligibility and registration, please refer to Internship Registration under Registration and Course Information in the Academic Policies and Regulations section of this catalog.

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours in free electives. Nine credit hours must be in courses at the 300-level or above. Six credit hours may be in any courses offered at or above the 100 level, excluding MTH 103 and MTH 111.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

*Directed Architectural Design Research (ARC 591)*

Permission to register in ARC 591 will be evaluated by the department based on previous academic performance and a written proposal. Completion of all upper-level studios (ARC 301, ARC 302, ARC 401-01, and ARC 402) with a minimum GPA of 3.50 in the sequence is required to apply to register in ARC 591. Students must consult with the department regarding proposal criteria and must submit all required material by the last day of exams during the semester in which they have completed ARC 402. ARC 591 will be counted as a free elective.

**Proposed Sequence of Study**
**Bachelor of Architecture (BArch)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 111 | Descriptive Drawing I | 3 |
| | DES 121 | Introduction to Architecture, Art and Design History | 3 |
| | DES 131 | Design Foundations I | 3 |
| | MTH 111 or MTH 103 | Mathematics for Architects or Calculus I | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **15** |
| Spring | DES 112 | Descriptive Drawing II | 3 |
| | DES 122 | Modern Developments in Architecture, Art and Design | 3 |
| | DES 132 | Design Foundations II | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **15** |

| SECOND YEAR (36 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ARC 201 | Architectural Design Studio I | 6 |
| | ARC 271 | Introduction to Landscape | 3 |
| | ARC 281 | Architectural Principles | 3 |
| | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | PHY 104 | Physics for Architects | 3 |
| | | **Total** | **18** |
| Spring | ARC 202 | Architectural Design Studio II | 6 |
| | ARC 222 | Modern Architecture and Urban Form | 3 |
| | ARC 232 | Materials and Methods I | 3 |
| | GER-COM | Communication | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ARC 301 | Architectural Design Studio III | 6 |
| | ARC 221 | Pre-Modern Architecture and Urban Form | 3 |
| | ARC 331 | Materials and Methods II | 3 |
| | GER-STA | Statistics | 3 |
| | | **Total** | **15** |
| Spring | ARC 302 | Architectural Design Studio IV | 6 |
| | ARC 342 | Structures for Architects | 3 |
| | ARC 382 | Architectural Detailing | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Summer | ARC 397 | Internship in Architecture | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ARC 401-01 | Architectural Design Studio V | 6 |
| | ARC 421 | Architectural Theory | 3 |
| | ARC 451 | Environmental Control Systems | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **15** |
| Spring | ARC 402 | Architectural Design Studio VI | 6 |
| | ARC 463 | Professional Practice | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

| FIFTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ARC 501 | Architectural Design Studio VII | 6 |
| | ARC 581 | Critical Practice and Contemporary Discourse | 3 |
| | ARC 591 or FRE | Directed Architectural Design Research or Free Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Spring | ARC 502 or ARC 592 | Architectural Design Studio VIII or Directed Architectural Design Studio | 6 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Bachelor of Interior Design (BID)

The profession of interior design lies between interior decoration and architecture. The interior designer must be competent to operate in both professions with an intimate knowledge of material selection, construction methods and furnishings as well as technical skills and construction expertise. Interior designers usually work as part of a design team, including architects, structural and mechanical engineers, and specialty consultants. They must possess a broad base of knowledge and skills.

Interior designers create and are responsible for all aspects of the interior environment: program, design, construction documents, supervision, lighting, and material and furniture selection. Like architects, they create interiors using space itself as a creative material, molded by architectural elements. They know intimately the materials of interior construction and finishing, decoration and lighting, and how to use these in innovative designs that support an overall spatial and formal idea.

Interior design services encompass research, development and implementation of plans and designs of interior environments. The objective is to improve the quality of life, increase productivity and protect the health, safety and welfare of the public. The professional interior designer must be able to see projects through from concept to physical completion.

Potential career options for persons majoring in interior design include interior designer, space planner and programmer, adaptive reuse designer, facilities planner, project manager, design journalist, educator, researcher, sales representative, renderer, healthcare designer and office planner.

**Program Goals**

The Bachelor of Interior Design degree program aims to:

- provide a comprehensive understanding of the historical and theoretical forces that shape interior built environments
- prepare future interior designers to make contributions to improving the built environment through leadership, personal engagement and professional practice while respecting human diversity and adhering to ethical standards
- provide students with the knowledge and skills necessary to conceive, develop and communicate complex design proposals
- foster critical thinking and cultivate an approach to design that values the role of research, analysis and experimentation
- promote a critical understanding of building technologies and their impact on the built environment

**Program Outcomes**

Upon completion of the Bachelor of Interior Design degree program, graduates should be able to:

- explain design principles in relationship to the history and theory of interior design
- demonstrate an understanding of the standards of professional practice
- demonstrate an understanding of the conventions of existing building systems and their impact on interior construction and human factors
- employ traditional means of representation, computer-aided design, digital and physical modeling and fabrication to develop and communicate design
- articulate, present and discuss design proposals in verbal, written and graphic form
- employ research, analysis and iterative processes to inform and enrich the process of design
- employ research, analysis and problem-solving skills to address unique and fluctuating conditions of design
- integrate materials, components, assembling methodologies, furniture, furnishing, health and safety, and environmental control systems into a comprehensive interior design proposal
- analyze and explain the relationship between design, environmental sustainability and interior applications of products and systems
- demonstrate the ability to independently develop design proposals that respond to context
- work in teams to conduct research on design-related issues and present results in verbal, written and graphic form

### Curriculum

The BID degree program at AUS emphasizes creativity and innovation in the art of interior design while giving students a strong background in technique and practical knowledge. The program core comprises six rigorous design studios following the common foundations year. Interior design studios encourage the development of analytical and reasoning skills, as well as the ability to conceptualize, develop and present designs. The interior design studios are supplemented by technical courses ranging from furniture design and materials and methods of interior construction to specific training in color and light.

The BID degree program is intended for the student seeking a professional career in interior design. The program entails a minimum of four years of university studies plus an approved internship. A minimum of 129 credit hours comprise the degree program, including a minimum of 78 credit hours of required course work in interior design and closely associated fields. These courses represent the core of the interior design discipline.

The specialized professional curriculum is supported by a minimum of 39 credit hours of university requirements. Designed to ensure a broad educational foundation, this base is held in common among all graduates of American University of Sharjah.

University studies represent a unique opportunity to explore other areas of interest. Based solely on individual interests, each interior design student must select a minimum of nine additional credit hours of free electives from general university offerings.

The curriculum is designed to meet requirements for licensure that prevail in the United Arab Emirates and to prepare the graduate for professional practice throughout the region. Some students may aspire either to advanced study in the field or to practice in a broader global setting. Accordingly, the curriculum follows established international norms for a professional degree in interior design.

### Formal Admission to the Program

The number of seats in interior design is limited. Formal admission is competitive. Only the most highly qualified foundations year students will be admitted. To be considered for formal admission to the Bachelor of Interior Design program, a student must successfully complete the following minimum requirements:

- all four foundations year studio courses (DES 111, DES 112, DES 131, DES 132) with a minimum GPA of 2.00 out of 4.00 in each sequence (Descriptive Drawing and Design Foundations)
- DES 121 Introduction to Architecture, Art and Design History and DES 122 Modern Developments in Architecture, Art and Design
- MTH 111 Mathematics for Architects or its prerequisite (MTH 003), or MTH 103 Calculus I
- at least one course in writing (WRI) at the 100 level or above

- a minimum of 27 undergraduate credit hours (credit hours earned including the above courses)
- a minimum CGPA of 2.30

In addition, selection for formal admission to the second year may also include portfolio review.

Formal notification of admission will be announced by the College of Architecture, Art and Design by the first week of the summer term after the release of the final grades by the Office of the Registrar at the end of the spring semester.

In the event that there are more students who qualify for formal admission than available seats, candidates will be admitted based on academic achievement, and a waiting list will be established. However, if there are fewer students who qualify for formal admission than available seats, consideration will be given to students who have applied for a change of major. If seats are still available at the time of fall registration, consideration will also be given to students who fulfilled requirements during summer term. The same formal admission criteria apply.

Only students formally admitted to the major are eligible for registration in the second-year studio course.

**Note:** To repeat a second-year studio course, students must compete for the limited number of seats in second-year studio courses based on the criteria for formal admission to the program.

## Advancement Reviews

The performance of each interior design student is reviewed following the completion of each of the second and third years in the program. Only the students who have attained a minimum CGPA of C+ (2.30) at the time of the review are eligible to advance to the following year studio.

A student who does not attain the required CGPA will be required to meet with the head of the department.

A student who fails an interior design studio twice is dismissed from the program.

## Degree Requirements

To qualify for graduation with a BID degree, students must successfully complete the following minimum requirements:

- a minimum of 129 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 78 credit hours of major requirements
  - a minimum of nine credit hours of free electives
  - five weeks of an approved internship
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

Please see the proposed sequence of study for information on completing the requirements in four years.

**General Education Requirements (minimum of 39 credit hours)**

Students in the BID degree program must successfully complete the following general education requirements:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement, including PHY 104
- mathematics requirement: MTH 103 or MTH 111
- statistics requirement: a minimum of three credit hours in courses meeting this requirement
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level or above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through IDE 463
- discipline-specific writing intensive course requirement: satisfied through IDE 225
- oral proficiency requirement: satisfied through IDE 401
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through IDE 201

For complete information on general education requirements, please refer to the Graduation Requirements section within the Academic Policies and Regulations section of this catalog.

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (78 credit hours)**

In addition to the foundations year courses, the following courses constitute the major requirements for the BID degree program:

- ARC 281 Architectural Principles
- IDE 201 Interior Design Studio I
- IDE 202 Interior Design Studio II
- IDE 225 History and Theory of Interior Design: Global and Regional Issues
- IDE 239 Interior Materials and Methods
- IDE 251 Color and Light
- IDE 301 Interior Design Studio III
- IDE 302 Interior Design Studio IV
- IDE 334 Furniture and Furnishings
- IDE 352 Environmental Control Systems in Interior Design
- IDE 397 Internship in Interior Design
- IDE 401 Interior Design Studio V
- IDE 402 Interior Design Studio
- IDE 434 Construction, Detailing and Structures
- IDE 463 Professional Practice

*Internship*

To qualify for graduation with a BID degree, students must fulfill the internship requirement. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical experience.

The internship consists of a minimum of 200 work hours with an approved employer. Interior design students are highly encouraged to complete the internship program during the summer

after completion of their third year of studies.

For details on internship eligibility and registration, please refer to Internship Registration under Registration and Course Information in the Academic Policies and Regulations section of this catalog.

**Free Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in free electives. Three credit hours must be in courses at the 300 level or above. Six credit hours may be in any courses offered at or above the 100 level, excluding MTH 103 and MTH 111.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Interior Design (BID)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 111 | Descriptive Drawing I | 3 |
| | DES 121 | Introduction to Architecture, Art and Design History | 3 |
| | DES 131 | Design Foundations I | 3 |
| | MTH 111 or MTH 103 | Mathematics for Architects or Calculus I | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **15** |
| Spring | DES 112 | Descriptive Drawing II | 3 |
| | DES 122 | Modern Developments in Architecture, Art and Design | 3 |
| | DES 132 | Design Foundations II | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **15** |

| SECOND YEAR (36 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IDE 201 | Interior Design Studio I | 6 |
| | IDE 251 | Color and Light | 3 |
| | ARC 281 | Architectural Principles | 3 |
| | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | PHY 104 | Physics for Architects | 3 |
| | | **Total** | **18** |
| Spring | IDE 202 | Interior Design Studio II | 6 |
| | IDE 225 | History and Theory of Interior Design: Global and Regional Issues | 3 |
| | IDE 239 | Interior Materials and Methods | 3 |
| | GER-COM | Communication | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **18** |

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IDE 301 | Interior Design Studio III | 6 |
| | IDE 352 | Environmental Control Systems in Interior Design | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | IDE 302 | Interior Design Studio IV | 6 |
| | IDE 334 | Furniture and Furnishings | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Summer | IDE 397 | Internship in Interior Design | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IDE 401 | Interior Design Studio V | 6 |
| | IDE 434 | Construction, Detailing and Structures | 3 |
| | GER-STA | Statistics | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | IDE 402 | Interior Design Studio VI | 6 |
| | IDE 463 | Professional Practice | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

# Department of Art and Design

Anijo Mathew, Head

**Faculty**

Hala Rabeea Al Ani
Hadeyeh Badri
Rebecca Beamer
Zinka Bejtic
Kathryn Best
Paula Jean Curran
Zlatan Filipović
Frederic Gmeiner
Riem Ibrahim
Marian Misiak
Philip Sheil
Gorda Stan
Seth Thompson

**Mission Statement**

The Department of Art and Design aims to cultivate critical thinking and learning through the study of design as a practice relevant to visual culture and communication.

## Bachelor of Science in Design Management (BSDM)

The Bachelor of Science in Design Management (BSDM) provides students with the opportunity to engage in a design-based program with entrepreneurial and communication components. Design management as a discipline integrates visual design and business studies. This major is especially well suited to students who have a keen interest in the managerial aspects of design. The essential elements of this profession are the ability to communicate design needs, track progress and outcomes, identify the requirements of design projects and coordinate with clients as well as with professional teams in the field of design.

The program provides broad insights into the foundations, theory and application of design and business studies. A solid foundation in visual design prepares students to understand the language and complexities involved in the efforts of the creative teams, as well as to speak fluently the "language" of design. Additionally, course work in the disciplines of business, management and communication prepares students to recruit clients; pitch projects; write copy for print,

television and radio; and master systems and marketing skills.

Typical target professional positions in the fast growing field of design management include administrative and managerial careers in media and service industries as advertising agency principals, project managers and team leaders, advertising campaign planners, client services specialists, advertising buyers, account and sales representatives, communications specialists, public relations professionals, exhibition and event planners, material culture administrators, market research analysts and more.

**Program Goals**

The Bachelor of Science in Design Management program aims to:

- provide students with appropriate management skills and knowledge for leadership within team-oriented design disciplines
- provide students with the knowledge and skills required for critically analyzing and solving design problems using specific applications to respond to a variety of audiences and contexts
- provide students with the opportunities to explore how forms of communication are influenced by ethical considerations, self-expression and professional demands

**Program Outcomes**

Upon completion of the Bachelor of Science in Design Management program, graduates will be able to:

- communicate effectively both orally and in writing
- integrate analytical, technical and critical skills necessary to succeed in the contemporary world of entrepreneurial design
- demonstrate knowledge of how the management and allocation of appropriate resources will sustain a design practice
- demonstrate the skills necessary to work with interdisciplinary teams and clients to design and implement projects
- organize, plan, direct, communicate and distribute information using traditional and digital media systems
- demonstrate knowledge of management, communication and information theories
- analyze and describe the technical, formal and conceptual aspects of communication within the design process
- apply theories of design and management
- interpret principles of management and marketing in order to explain regional and global markets
- employ traditional and digital systems and media in the process of design and management projects
- demonstrate an understanding of the complex demands of design, business, labor and law
- demonstrate an understanding of ethical, social and cultural significance of design
- demonstrate an understanding of sustainable business models that are professionally and socially equitable
- explain how design projects for the media and service industries are initiated and evaluated

## Degree Requirements

To qualify for graduation with a BSDM degree, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 60 credit hours of major requirements
  - a minimum of 12 credit hours of major electives
  - a minimum of six credit hours of free electives
  - five weeks of an approved internship
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 39 credit hours)**

Students in the BSDM degree program must successfully complete the following general education requirements:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement
- mathematics requirement: MTH 101 or a minimum of three credit hours in any MTH course at the 100 level or above meeting this requirement
- statistics requirement: STA 202 or QBA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level or above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204, and ENG 225
- ethical understanding requirement: satisfied through DES 462
- discipline-specific writing intensive course requirement: satisfied through DES 231
- oral proficiency requirement: satisfied through DES 300
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through DES 230

For complete information on general education requirements, please refer to the Graduation Requirements section within the Academic Policies and Regulations section of this catalog.

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (60 credit hours)**

The following courses constitute the major requirements for the BSDM degree program:

*In the College of Architecture, Art and Design (42 credit hours)*

- DES 111 Descriptive Drawing I
- DES 121 Introduction to Architecture, Art and Design History or DES 122 Modern Developments in Architecture, Art and Design
- DES 131 Design Foundations I
- DES 200 Communication Design

- DES 230 Digital Media in Communication Design
- DES 231 History of Design
- DES 275 Fundamentals of Design Management
- DES 300 Design Project
- DES 360 Critical Discourse in Design
- DES 380 Innovation and Strategy
- DES 397 Internship in Design Management
- DES 462 Design Management
- DES 475 Service Design
- DES 480 Design Thinking
- VIS 361 The Design Profession

*In the School of Business Administration (18 credit hours)*

- BIS 101 Business Information Systems
- ECO 201 Principles of Microeconomics
- ECO 202 Principles of Macroeconomics
- MGT 201 Fundamentals of Management
- MGT 301 Organizational Behavior
- MKT 201 Fundamentals of Marketing

*Internship*

Internship is a requirement for graduation. Arrangements for the internships are normally made with the students in the spring semester of their third year.

The internship comprises five weeks of full-time work placement (normally 200 hours) at an approved professional company during the summer of the student's third year. A review of the student's internship journal and feedback from the employer are the basis of passing the internship requirement.

For details on internship eligibility and registration, please refer to Internship Registration under Registration and Course Information in the Academic Policies and Regulations section of this catalog.

**Major Electives**
**(minimum of 12 credit hours)**

Students are required to successfully complete at least three of the four major electives in courses at the 300 level or above. They can choose to take courses from the following:

- ENG 231 Writing for Visual Media
- PSY 101 General Psychology
- PSY 102 Social Psychology
- THE 321 Arts Management
- any course in CAAD, excluding ART courses
- any course in SBA, excluding BUS 100
- any course in mass communication

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives**
**(minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in free electives selected from courses offered at or above the 100 level, excluding MTH 101, MTH 103 and MTH 111.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Design Management (BSDM)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 111 | Descriptive Drawing I | 3 |
| | DES 121* or MJE | Introduction to Architecture, Art and Design History or Major Elective | 3 |
| | DES 131 | Design Foundations I | 3 |
| | MTH 101** | Mathematics for Business | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **15** |
| Spring | DES 122* or MJE | Modern Developments in Architecture, Art and Design or Major Elective | 3 |
| | DES 230 | Digital Media in Communication Design | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

*Students must take either DES 121 or DES 122 to meet the major requirements.
**Students can take MTH 101 or any other 100-level or above MTH course meeting the GER-MTH requirement.

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hour** |
| Fall | BIS 101 | Business Information Systems | 3 |
| | DES 200 | Communication Design | 3 |
| | DES 231 | History of Design | 3 |
| | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | STA 202 or QBA 201 | Introduction to Statistics for Social Sciences or Quantitative Business Analysis | 3 |
| | | **Total** | **15** |
| Spring | DES 275 | Fundamentals of Design Management | 3 |
| | ECO 201 | Principles of Microeconomics | 3 |
| | MGT 201 | Fundamentals of Management | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 300 | Design Project | 3 |
| | ECO 202 | Principles of Macroeconomics | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **15** |
| Spring | DES 360 | Critical Discourse in Design | 3 |
| | DES 380 | Innovation and Strategy | 3 |
| | MKT 201 | Fundamentals of Marketing | 3 |
| | VIS 361 | The Design Profession | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | DES 397 | Internship in Design Management | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 462 | Design Management | 3 |
| | DES 475 | Service Design | 3 |
| | ENG 225 | Writing for Business | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | DES 480 | Design Thinking | 3 |
| | MGT 301 | Organizational Behavior | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Bachelor of Science in Multimedia Design (BSMD)

Multimedia design studies span a number of disciplines associated with time-based and interactive media. This major engages students with broad-ranging interests in communications, motion graphics, audiovisual narrative construction and interactive applications.

Potential career options for persons majoring in multimedia design include web design, mobile app design, advertising graphics, animation, computer games design and new media. Multimedia is used in social media, libraries, museums, security systems, TV, publishing houses, schools, retailers, films, games, training and interactive design.

**Program Goals**

The Bachelor of Science in Multimedia Design program aims to:

- provide students with the knowledge and skills necessary to solve communication problems and competently practice within the multimedia design fields
- introduce students to the knowledge and skills to develop appropriate communicative form across media, dimensions and formats
- provide students with the knowledge and skills required for critically analyzing and solving design problems using specific applications to respond to a variety of audiences and contexts

**Program Outcomes**

Upon completion of the Bachelor of Science in Multimedia Design program, graduates will be able to:

- communicate effectively both orally and in writing
- integrate a range of tools, media and technology in the processes of design and production
- reflect upon and explain the ethical dimensions of practice within multimedia design fields
- apply appropriate skills, particularly digital tools and techniques, within multimedia design fields
- demonstrate knowledge and abilities necessary to create designed experiences that are developed using storyboarding, computer scripting, sound editing and interface design
- employ visual and verbal forms of communication to convey ideas and information
- demonstrate an understanding of the practical relationship between form, content and context
- demonstrate the ability to use new and emerging technology as a vehicle for the invention of form and a means of effective communication
- employ interactive and time-based media formats (and their delivery) to mediate and communicate content
- plan, coordinate and manage multimedia design projects
- conduct research, synthesize information and apply specific knowledge within the design process
- discuss, analyze and evaluate the technical, formal and conceptual aspects of mediated communication
- demonstrate a critical understanding of design practice within regional and global contexts
- analyze precedents of contemporary works of visual culture to inform multimedia design and production
- demonstrate an understanding of professional responsibility to client and audience

### Curriculum

The BSMD degree program requires a minimum of four years of course work for a minimum of 126 credit hours, 69 credit hours of which are required in multimedia-related studies, including sound, video, text, computer graphics and theory courses. The specialization is supported by a minimum of 39 credit hours of general education requirements and a minimum of 15 credit hours of free electives. In addition, an approved internship is required of all students; firm/company placement normally occurs in the summer after completion of the third year.

The BSMD is a professional degree program designed for those who seek careers in modern design and media practice or in preparation of graduate studies. The curriculum follows standards of professional North American practice and is conceived to meet or exceed the requirements of multimedia industries in the United Arab Emirates.

### Formal Admission to the Program

The number of seats in multimedia design is limited. Formal admission is competitive. Only the most highly qualified foundations year students will be admitted. To be considered for formal admission to the Bachelor of Science in Multimedia Design degree program, a student must successfully complete the following minimum requirements.

- all four foundations studio courses (DES 111, DES 112, DES 131, DES 132) with a minimum grade point average (GPA) of C (2.00) in each sequence (Descriptive Drawing and Design Foundations)
- DES 121 Introduction to Architecture, Art and Design History and DES 122 Modern Developments in Architecture, Art and Design
- MTH 100 or any other MTH course
- at least one course in writing (WRI) at the 100 level or above
- a minimum of 27 undergraduate credit hours (credit hours earned including the above courses)
- a minimum CGPA of 2.30

In addition, selection for formal admission may also include portfolio review.

Formal notification of admission will be announced by the College of Architecture, Art and Design by the first week of the summer term after the release of the final grades by the Office of the Registrar at the end of the spring semester.

In the event that there are more students who qualify for formal admission than available seats, candidates will be admitted based on overall academic achievement, and a waiting list will be established. However, if there are fewer students who qualify for formal admission than available seats, consideration will be given to students who have applied for a change of major. If seats are still available at the time of fall registration, consideration will also be given to students who fulfilled requirements during summer term. The same formal admission criteria apply.

Only students formally admitted to the major are eligible for registration in the second-year studio course.

**Note:** To repeat a second-year studio course, students must compete for the limited number of seats in second-year studio courses based on the criteria for formal admission to the program.

### Advancement Reviews

The performance of all students in multimedia design will be reviewed following the completion of the second year for retention in the program. To successfully pass this review and to continue in the major, a combined GPA of C+ (2.30) must be attained in MUM 201 and MUM 202, with a minimum grade of C- (1.70) in each course.

Students' performance is also reviewed following the completion of the third year for retention in the program. In order to continue in the major, a combined GPA of C+ (2.30) must be attained in MUM 301-01 and MUM 302-01 with a minimum of C- (1.70) in each course.

A student who fails a studio, or does not attain the required studio average, will be required to meet with the head of the department.

A student who does not attain the required studio average must repeat the studio with the lower grade.

Any multimedia design studio may be repeated only once. A student who fails to achieve the minimum studio average necessary for promotion after repeating is dismissed from the program.

## Degree Requirements

To qualify for graduation with a BSMD degree, students must successfully complete the following minimum requirements:

- a minimum of 126 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 69 credit hours of major requirements
  - a minimum of 15 credit hours of free electives
  - five weeks of an approved internship
- a minimum studio average of 2.30 in the final studio sequence (MUM 405 and MUM 406)
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**Note:** A student who does not attain the required studio average of 2.30 in the final studio sequence must repeat the studio with the lower grade.

Please see the proposed sequence of study for information on completing the requirements in four years.

**General Education Requirements (minimum of 39 credit hours)**

Students in the BSMD degree program must successfully complete the following general education requirements:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement
- mathematics requirement: MTH 100 or a minimum of three credit hours in any MTH course at the 100 level or above meeting this requirement
- statistics requirement: a minimum of three credit hours in courses meeting this requirement
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level or above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through VIS 361
- discipline-specific writing intensive course requirement: satisfied through DES 231
- oral proficiency requirement: satisfied through MUM 405
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through MUM 201

For complete information on general education requirements, please refer to the Graduation Requirements section within the Academic Policies and Regulations section of this catalog.

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (69 credit hours)**

In addition to the foundations year courses, the following courses constitute the major requirements for the BSMD degree program:

- DES 231 History of Design
- DES 232 Research Methodologies for Design
- MUM 201 Multimedia Design Studio I
- MUM 202 Multimedia Design Studio II
- MUM 221 Motion Graphics and Video
- MUM 301-01 Multimedia Design Studio III
- MUM 302-01 Multimedia Design Studio IV
- MUM 304 Media Systems and Publishing
- MUM 331 3D Animation
- MUM 360 Multimedia Design History and Theory
- MUM 397 Internship in Multimedia Design
- MUM 405 Multimedia Design Studio V
- MUM 406 Multimedia Design Studio VI
- VIS 221 Photography Basics
- VIS 231 Typography I: Normative Typographic Principles
- VIS 361 The Design Profession

*Internship*

Internship is a requirement for graduation. Arrangements for the internships are normally made with the students in the spring semester of their third year.

The internship comprises five weeks of full-time work placement (normally 200 hours) at an approved professional company during the summer of the student's third year. A review of the student's internship journal and feedback from the employer are the basis of passing the internship requirement.

For details on internship eligibility and registration, please refer to Internship Registration under Registration and Course Information in the Academic Policies and Regulations section of this catalog.

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credits in free electives. Nine credits must be in courses at the 300-level or above. Six credits may be in any courses offered at or above the 100 level.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Multimedia Design (BSMD)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 111 | Descriptive Drawing I | 3 |
| | DES 121 | Introduction to Architecture, Art and Design History | 3 |
| | DES 131 | Design Foundations I | 3 |
| | MTH 100* | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **15** |
| Spring | DES 112 | Descriptive Drawing II | 3 |
| | DES 122 | Modern Developments in Architecture, Art and Design | 3 |
| | DES 132 | Design Foundations II | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **15** |

*Students can take MTH 100 or any other 100-level or above MTH course meeting the GER-MTH requirement.

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MUM 201 | Multimedia Design Studio I | 3 |
| | VIS 221 | Photography Basics | 3 |
| | VIS 231 | Typography I: Normative Typographic Principles | 3 |
| | DES 231 | History of Design | 3 |
| | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | | **Total** | **15** |
| Spring | MUM 202 | Multimedia Design Studio II | 3 |
| | MUM 221 | Motion Graphics and Video | 3 |
| | DES 232 | Research Methodologies for Design | 3 |
| | GER-STA | Statistics | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| THIRD YEAR (36 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MUM 301-01 | Multimedia Design Studio III | 3 |
| | MUM 331 | 3D Animation | 3 |
| | MUM 360 | Multimedia Design History and Theory | 3 |
| | VIS 361 | The Design Profession | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **18** |
| Spring | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MUM 302-01 | Multimedia Design Studio IV | 3 |
| | MUM 304 | Media Systems and Publishing | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | GER-COM | Communication | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Summer | MUM 397 | Internship in Multimedia Design | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MUM 405 | Multimedia Design Studio V | 6 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MUM 406 | Multimedia Design Studio VI | 6 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Bachelor of Science in Visual Communication (BSVC)

The creation, manipulation and production of visual images and text are at the core of this major. Visual communication is influenced to a large degree by fast-changing worldwide technologies. Apart from broad technical, computer and design education, visual communication practitioners require an understanding of aesthetic trends, human nature, ethical boundaries and societal needs. Visual communicators aim to inform, persuade and influence behavior through the application of design principles.

Potential career options for persons majoring in visual communication fall under a large umbrella that includes graphic design, commercial advertising, illustration and photography. Typical job titles include graphic designer, web designer, creative manager, art director, commercial/advertising photographer, communication designer and commercial artist.

### Program Goals

The Bachelor of Science in Visual Communication degree program aims to:

- provide students with the practical knowledge and skills necessary to competently practice design within the visual communications fields
- introduce students to the knowledge and skills to develop appropriate, communicative visual form within various media, dimensions and formats
- provide students with the knowledge and skills required for critically analyzing and solving design problems using specific applications to respond to a variety of audiences and contexts

### Program Outcomes

Upon completion of the Bachelor of Science in Visual Communication degree program, graduates will be able to:

- communicate effectively both orally and in writing
- integrate a range of tools, media and technology in the processes of design and production
- reflect upon and explain the ethical considerations related to creation, production, management and distribution within visual communication fields
- create and utilize image, language and typographic form in order to communicate specific content
- demonstrate an understanding of the practical relationship between form, content and context
- analyze various media formats to determine their effectiveness in mediating and communicating content
- demonstrate proficiency in the appropriate use of multiple design technologies
- conduct research, synthesize information and apply specific knowledge within the design process
- discuss, analyze and evaluate the technical, formal and conceptual aspects of visual communication

- analyze and describe contemporary and historical examples of visual communications
- explain how ideas are communicated and information is presented in the context of professional practice
- demonstrate a critical understanding of design practice within regional and global contexts

## Curriculum

The BSVC degree program requires a minimum of four years of university studies. The foundations year of visual communication consists of a basic education in applied design, training in computer applications and courses in the history, theory and relevance of design and visual expression. In the following years, elements of design practice are explored in individual, hands-on studio projects. The design studio sequence is the program core that integrates practical, cultural and contextual aspects of visual communication.

The BSVC is a professional degree program. The minimum of 126 credit hours required for the degree comprise 69 credit hours in required visual communication, digital applications and visual design-related courses. This specialization is supported by a minimum of 39 credit hours of general education requirements and a minimum of 15 credit hours of free electives. In addition, an approved internship is required of all students; firm/company placement occurs in the summer after completion of the third year.

The BSVC is configured to prepare those who seek careers as designers as well as those who plan to pursue graduate studies in visual communication-related areas. The curriculum follows standards of professional North American organizations and is designed to meet or exceed requirements for visual communication experts in the United Arab Emirates.

## Formal Admission to the Program

The number of seats in the visual communication program is limited. Formal admission is competitive. Only the most highly qualified foundations year students will be admitted. To be considered for formal admission to the Bachelor of Science in Visual Communication program, a student must successfully complete the following minimum requirements.

- all four foundations studio courses (DES 111, DES 112, DES 131, DES 132) with a minimum grade point average (GPA) of C (2.00) in each sequence (Descriptive Drawing and Design Foundations)
- DES 121 Introduction to Architecture, Art and Design History and DES 122 Modern Developments in Architecture, Art and Design
- MTH 100 or any other MTH course
- at least one course in writing (WRI) at the 100 level or above
- a minimum of 27 undergraduate credit hours (credit hours earned including the above courses)
- a minimum CGPA of 2.30

In addition, selection for formal admission may also include portfolio review.

Formal notification of admission will be announced by the College of Architecture, Art and Design by the first week of the summer term after the release of the final grades by the Office of the Registrar at the end of the spring semester.

In the event that there are more students who qualify for formal admission than available seats, candidates will be advanced based on academic achievement, and a waiting list will be established. However, if there are fewer students who qualify for formal admission than available seats, consideration will be given to students who have applied for a change of major. If seats are still available at the time of fall registration, consideration will be given to students who fulfilled requirements during summer term. The same formal admission criteria apply.

Only students formally admitted to the major are eligible for registration in the second-year studio course.

**Note:** To repeat a second-year studio course, students must compete for the limited number of seats in second-year studio courses based on the criteria for formal admission to the program.

## Advancement Reviews

The performance of all students in the visual communication program will be reviewed following the completion of the second year for retention in the program. To successfully pass this review and to continue in the major, a combined GPA of C+ (2.30) must be attained in VIS 201 and VIS 202, with a minimum grade of C- (1.70) in each course.

Students' performance is also reviewed following the completion of the third year for retention in the program. In order to continue in the major, a combined GPA of C+ (2.30) must be attained in VIS 301 and VIS 302 with a minimum of C- (1.70) in each course.

A student who fails a studio, or does not attain the required studio average, will be required to meet with the head of the department.

A student who does not attain the required studio average must repeat the studio with the lower grade.

Any visual communication studio may be repeated only once. A student who fails to achieve the minimum studio average necessary for promotion after repeating is dismissed from the program.

## Degree Requirements

To qualify for graduation with a BSVC degree, students must successfully complete the following minimum requirements:

- a minimum of 126 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 69 credit hours of major requirements
  - a minimum of 15 credit hours of free electives
  - five weeks of an approved internship
- a minimum studio average of 2.30 in the final studio sequence (VIS 405 and VIS 406)
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**Note:** A student who does not attain the required studio average of 2.30 in the final studio sequence must repeat the studio with the lower grade.

Please see the proposed sequence of study for information on completing the requirements in four years.

**General Education Requirements (minimum of 39 credit hours)**

Students in the BSVC degree program must successfully complete the following general education requirements:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement
- mathematics requirement: MTH 100 or a minimum of three credit hours in any MTH course at the 100 level or above meeting this requirement
- statistics requirement: a minimum of three credit hours in courses meeting this requirement
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level or above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through VIS 361
- discipline-specific writing intensive course requirement: satisfied through DES 231
- oral proficiency requirement: satisfied through VIS 405
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through VIS 201

For complete information on general education requirements, please refer to the Graduation Requirements section within the Academic Policies and Regulations section of this catalog.

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (69 credit hours)**

In addition to the foundations year courses, the following courses constitute the major requirements for the BSVC degree program:

- DES 231 History of Design
- DES 232 Research Methodologies for Design
- DES 360 Critical Discourse in Design
- VIS 201 Design Studio I
- VIS 202 Design Studio II
- VIS 221 Photography Basics
- VIS 231 Typography I: Normative Typographic Principles
- VIS 242 Electronic Online Publishing
- VIS 301 Design Studio III
- VIS 302 Design Studio IV
- VIS 331 Typography II: Complex Typographic Systems
- VIS 342 Environment, Experience and Interaction Design
- VIS 361 The Design Profession
- VIS 397 Internship in Visual Communication
- VIS 405 Design Studio V
- VIS 406 Design Studio VI

*Internship*

Internship is a requirement for graduation. Arrangements for the internships are normally made with the students in the spring semester of their third year.

The internship comprises five weeks of full-time work placement (normally 200 hours) at an approved professional company during the summer of the student's third year. A review of the student's internship journal and feedback from the employer are the basis of passing the internship requirement.

For details on internship eligibility and registration, please refer to Internship Registration under Registration and Course Information in the Academic Policies and Regulations section of this catalog.

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours in free electives. Nine credit hours must be in courses at the 300 level or above. Six credit hours may be in any courses offered at or above the 100 level.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Visual Communication (BSVC)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | DES 111 | Descriptive Drawing I | 3 |
| | DES 121 | Introduction to Architecture, Art and Design History | 3 |
| | DES 131 | Design Foundations I | 3 |
| | MTH 100* | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **15** |
| Spring | DES 112 | Descriptive Drawing II | 3 |
| | DES 122 | Modern Developments in Architecture, Art and Design | 3 |
| | DES 132 | Design Foundations II | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **15** |

*Students can take MTH 100 or any other 100-level or above MTH course meeting the GER-MTH requirement.

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | VIS 201 | Design Studio I | 3 |
| | VIS 221 | Photography Basics | 3 |
| | VIS 231 | Typography I: Normative Typographic Principles | 3 |
| | DES 231 | History of Design | 3 |
| | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | | **Total** | **15** |
| Spring | VIS 202 | Design Studio II | 3 |
| | VIS 242 | Electronic Online Publishing | 3 |
| | DES 232 | Research Methodologies for Design | 3 |
| | GER-STA | Statistics | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| THIRD YEAR (36 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | VIS 301 | Design Studio III | 3 |
| | VIS 331 | Typography II: Complex Typographic Systems | 3 |
| | VIS 361 | The Design Profession | 3 |
| | DES 360 | Critical Discourse in Design | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **18** |
| Spring | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | VIS 302 | Design Studio IV | 3 |
| | VIS 342 | Environment, Experience and Interaction Design | 3 |
| | GER-COM | Communication | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Summer | VIS 397 | Internship in Visual Communication | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | VIS 405 | Design Studio V | 6 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | VIS 406 | Design Studio VI | 6 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Minor in Design Management

Students enrolling in the design management minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in design management must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (6 credit hours)**

Students must successfully complete six credit hours as follows:

- DES 111 Descriptive Drawing I or DES 131 Design Foundations I
- MGT 201 Fundamentals of Management

**Minor Electives (minimum of 12 credit hours)**

Students must successfully complete 12 credit hours, with a minimum of nine credit hours in courses at the 300 level or above, as follows:

- at least six credit hours in CAAD courses. ART courses do not meet this requirement.
- at least six credit hours in SBA courses

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from approved graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. In meeting this requirement, the graduate-level courses must comply with the minor electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Film

Students enrolling in the film minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in film must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor

successfully completed in residence at AUS

- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete nine credit hours as follows:

- FLM 100 The Art of Film
- FLM 210 Narrative Structure in Film
- FLM 310 Film Production I

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours from the following list of courses:

- ENG 378 Literature as Film
- ENG 393 Shakespeare On Film
- FLM 312 Film Production II
- FLM 332 Experimental Film and Video I
- FLM 360 Screenwriting
- FLM 401 Significant Film Genres
- FLM 410 Advanced Film Production
- FLM 412 Documentary Film Production
- MUM 311 Animation
- MUM 331 3D Animation
- any approved special topic courses at the 300-level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to view course classifications.

## Minor in Illustration and Animation

Students enrolling in the illustration and animation minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in illustration and animation must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 12 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (12 credit hours)**

Students must successfully complete 12 credit hours as follows:

- DES 111 Descriptive Drawing I or ART 111 Freehand Drawing
- MUM 311 Animation
- VIS 213 Illustration Drawing or ART 211 Intermediate Drawing
- VIS 313 Visual Narrative

**Minor Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours from the following list of courses, with a minimum of three credit hours from courses at the 300 level or above:

- DES 230 Digital Media in Communication Design
- DES 332 Design Games for Collaboration
- ENG 301 Creative Writing
- FLM 210 Narrative Structure in Film
- MUM 331 3D Animation
- VIS 311 Illustration Design
- VIS 312 Illustration Genres
- any approved special topic courses at the 300-level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to view course classifications.

## Minor in Photography

Students enrolling in the photography minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in photography must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete nine credit hours as follows:

- DES 231 History of Design
- DES 362 History of Photography: The Portrait
- VIS 221 Photography Basics or DES 160 Introduction to Photography

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours from the following list of courses:

- ARC 316 Photography and Visual Representation
- VIS 321 Photojournalism or MCM 377 Photojournalism
- VIS 323 Photography for Communication
- VIS 325 Creative Studio Photography
- VIS 327 Analog Photography Processes
- any approved special topic courses at the 300-level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to view course classifications.

## Minor in Product Design

Students enrolling in the product design minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in product design must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete nine credit hours as follows:

- DES 170 Introduction to Product Design
- DES 270 Design as Form
- DES 370 Introduction to Prototyping

**Minor Electives**
**(minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours from the following list of courses:

- DES 340 Materials and Processes for Design
- DES 374 Package Design
- DES 462 Design Management
- IDE 335 Furniture Design Basics
- IDE 460 Exhibition Design
- any approved special topic courses at the 300-level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to view course classifications.


GROW UP


BOSS

# College of Arts and Sciences

**Dean**
Mahmoud Anabtawi

**Associate Dean for Undergraduate Affairs**
Ahmad Al-Issa

**Associate Dean for Graduate Affairs**
Hana Sulieman

The mission of the College of Arts and Sciences is to educate and train students in the liberal arts tradition and to serve as a model of collegiality, liberal learning, scholarship and inquiry. To this end, we offer students the opportunity to probe deeply within and explore linkages across the liberal arts disciplines by offering a robust, diverse curriculum of study in a variety of academic and experiential settings.

Graduates of the College of Arts and Sciences will be prepared to achieve their personal and professional aspirations. They will be well qualified to pursue professional training and/or graduate degrees of their choice.

## Degree Offerings

The College of Arts and Sciences offers the following undergraduate degree programs:

- Bachelor of Arts in English Language and Literature
- Bachelor of Arts in International Studies
- Bachelor of Arts in Mass Communication
- Bachelor of Arts in Psychology
- Bachelor of Science in Biology
- Bachelor of Science in Chemistry
- Bachelor of Science in Environmental Sciences
- Bachelor of Science in Mathematics
- Bachelor of Science in Physics

For information on the college's graduate programs, please see the *AUS Graduate Catalog*.

## Minor Offerings

The College of Arts and Sciences offers the following minors:

- actuarial mathematics
- applied and computational mathematics
- applied physics
- Arabic language and literature
- biology
- data science
- English/Arabic translation
- English language
- English literature
- environmental policy
- environmental sciences
- history
- integrated marketing communications
- international studies
- journalism
- Middle Eastern studies
- music
- philosophy
- psychology
- theatre
- women's studies

# Department of Arabic and Translation Studies

David Wilmsen, Head

**Faculty**
Wesam Al-Assadi
Mariam Al-Attar
Ahmed Ali
Meis Al-Kaisi
Nuha Al-Sha'ar
Said Faiq
Usman Ghani
Ronak Husni
Sattar Izwaini
Boutheina Khaldi
Imed Nsiri
Mai Zaki

The mission of the Department of Arabic and Translation Studies is to cultivate students' knowledge and understanding of Arabic language and literature, Arab and Islamic studies, and Arabic/English translation and intercultural studies with the aim of preparing its graduates for academic and professional success. For Arabic language and literature and Arab and Islamic studies, students will acquire the necessary linguistic, literary, historical and cultural knowledge of Arabic and associated cultural contexts, and develop the ability to reflect critically on these areas. For Arabic/English translation and intercultural studies, students will acquire the knowledge of and the tools for the use of the two languages effectively in a variety of media, genres and contexts that pertain to translation as intercultural communication.

The department offers minors in Arabic language and literature and in English/Arabic translation. It also houses the graduate program in Arabic/English/Arabic translation and interpreting (see the *AUS Graduate Catalog*).

## Minor in Arabic Language and Literature

The minor in Arabic language and literature aims to enhance students' awareness and appreciation of the language, culture and literature of the Arab world. The minor is ideally suited for students in the humanities and social sciences, as well as students in applied sciences and business pursuing research or employment opportunities anywhere in the Arab world. The minor provides for a better understanding of Arabic language and literature in a global context. Furthermore, it meets the increasing regional and global demand for degree-holders proficient in Arabic language and culture.

Students enrolling in the Arabic language and literature minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in Arabic language and literature must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (6 credit hours)**

Students must successfully complete the following courses:

- ARA 101 Introduction to Arabic Heritage I (Arabic or English) or ARA 102 Introduction to Arabic Heritage II (Arabic or English)
- ARA 204 Intermediate Arabic II or ARA 210 Composition for Native Speakers of Arabic or ARA 308 Arabic Grammar in Use

**Minor Electives**
**(minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours, with a minimum of nine credit hours in courses at the 300 level or above. Courses can be taken from the following:

- any 200-level or above ARA courses
- TRA 210 Introduction to Translation

## Minor in English/Arabic Translation

To qualify for a minor in English/Arabic translation, students must demonstrate fluency in English and Arabic. In tandem with a solid grounding in communicative skills and linguistic analysis, the minor in translation focuses on written translation skills in a variety of settings and across disciplines. It also offers an insight into interpreting with a focus on the community. Throughout the program, students are provided with relevant theoretical input that establishes a framework for the study of translation and offers the tools to identify, analyze and resolve translation problems. This program of study will enable AUS students from any discipline to further enhance their employability chances and, more importantly, to be able to mediate in English between the world of their education and their community.

Students enrolling in the English/Arabic translation minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in English/Arabic translation must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements**
**(6 credit hours)**

Students must successfully complete the following courses:

- TRA 210 Introduction to Translation
- TRA 220 Theoretical and Practical Issues in Translation or
  TRA 230 Translating Arabic Literary Texts

**Minor Electives**
**(minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours, with a minimum of nine credit hours in courses at the 300 level or above. Courses can be taken from the following two categories:

*Translation Courses*
*(minimum of 6 credit hours)*

Students must successfully complete a minimum of six credit hours in courses selected from the following list and not used as minor requirements:

- TRA 220 Theoretical and Practical Issues in Translation
- TRA 230 Translating Arabic Literary Texts
- TRA 301 Modern Media Translation
- TRA 303 Interpreting: Focus on the Community
- TRA 307 Screen Translation
- TRA 401 Translation Evaluation and History
- any approved 200-level or above TRA special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

*Non-Translation Courses*
*(maximum of 6 credit hours)*

Students must successfully complete a maximum of six credit hours in courses selected from the following list:

- ARA 308 Arabic Grammar in Use
- ARA 360 Arabic Linguistics
- ENG 321 Cultures in Contact

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from approved graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. In meeting this requirement, the graduate-level courses must comply with the minor electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

# Department of Biology, Chemistry and Environmental Sciences

Naveed Khan, Head

**Faculty**

Mohamed Abouleish
Imad Abu-Yousef
Mohammed Al-Sayah
Aaron Bartholomew
Ivonne Bejarano
Sarah Dalibalta
Oussama El-Kadri
Yehya El-Sayed
Sofian Kanan
Reem Khalil
Mustafa Khamis
Sandra Knuteson
Amin Majdalawieh
Lucia Pappalardo
Fatin Samara

The Department of Biology, Chemistry and Environmental Sciences oversees bachelor of science degrees in each of these three disciplines. The department enables graduates to pursue a variety of professions in science by providing them with rigorous training in the core areas with emphasis on hands-on experience. Whereas the biology and chemistry degree programs are similar to those in North American universities, the environmental sciences degree program is cognizant of the specific issues and challenges in the Gulf region.

The department maintains close relationship with alumni, local industries, environmental agencies and employers who provide internship and career opportunities to students.

**Premedical Studies Preparation**

AUS offers premedical studies (premed) courses that conform to the Medical College Admission Test (MCAT) requirements. For students seeking careers in medicine, the department offers MCAT advice on enhancing their medical school admission prospects. AUS has premed memoranda of understanding (MOUs) with American University of Beirut (AUB), Lebanese American University (LAU) and University of Balamand (UOB). AUS graduates in any discipline—including science, engineering, business, arts and the humanities—can now apply to the medical schools of these universities, provided they have completed specified premed science requirements. Successful applicants must also meet minimum admission criteria in terms of major GPA, cumulative GPA, and MCAT and interview scores. In recognition of the shared values and goals with AUS, these universities evaluate AUS applicants as graduates from a "sister" university.

## Bachelor of Science in Biology (BSB)

The mission of the Bachelor of Science in Biology program is to provide students with a broadly based, rigorous education in a variety of biology areas. These include environmental biology, ecosystems management, environmental protection, species conservation, physiology, microbiology, molecular biology, genetics, health research, immunology and science education.

**Program Goals**

The Bachelor of Science in Biology program seeks to:

- provide students with an integrated knowledge of contemporary principles and applications of biology that will prepare them for advanced degrees and careers in teaching, research, consulting, medicine, genetic engineering and biotechnology
- provide a high-quality, laboratory-rich learning environment where students will learn proper laboratory protocols, plan and conduct experiments in various areas of biology, practice the scientific method, analyze data, and reach logical and reasonable conclusions
- provide opportunities for interested and qualified students to participate in meaningful research projects of their own, under the guidance of the biology faculty
- maintain a dynamic curriculum that reflects the needs of a changing world
- foster motivation and opportunities for lifelong learning

**Program Outcomes**

Upon graduation from the Bachelor of Science in Biology program, students will be able to:

- gain practical, experience-based learning
- apply technologies and become proficient in the use of modern instrumentation
- identify and carry out thoughtful approaches to biology-related problems, including ethical issues and biological threats to the environment
- develop competence in critical thinking, communications, teamwork, information technology and adaptation to change
- produce written and oral reports using resources found in the scientific literature
- demonstrate knowledge of the fundamentals of various molecular, cell and ecological techniques, instruments and equipment

**Career Opportunities**

Graduates of the Bachelor of Science in Biology program will have the training necessary to work in many areas including genetic research laboratories, immunology research, human genetics counseling, agriculture, horticulture, soil science, marine aquaculture, fisheries, forestry, science education and teaching at all levels, scientific journalism, veterinary medicine, drug and biotechnology, ecosystems management, conservation law enforcement, bioinformatics database companies, pharmaceutical sales and production, university and hospital research centers, natural history museums, nature parks and zoological gardens, government wildlife management, centers for disease control, epidemiology, virology, food testing, public health, and medical and blood testing laboratories.

### Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the following conditions:

- a cumulative grade point average (CGPA) of 2.00
- a minimum grade of C- (1.70) in at least 19 credit hours from the following list of required first-year-level science and mathematics courses: BIO 101, BIO 102, CHM 101, CHM 102, PHY 101, PHY 101L, MTH 103

AUS students transferring into the program must meet the formal admission requirements listed above. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

### Degree Requirements

To qualify for graduation with a Bachelor of Science in Biology, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 46 credit hours of major requirements
  - a minimum of 15 credit hours of major electives
  - a minimum of 15 credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: BIO 101 and CHM 101
- mathematics requirement: MTH 103
- statistics requirement: STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through BIO 251
- discipline-specific writing intensive course requirement: satisfied through BIO 361
- oral proficiency requirement: satisfied through BIO 251
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through STA 201

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (46 credit hours)**

- BIO 102 General Biology II
- BIO 210 Introduction to Human Anatomy and Physiology
- BIO 251 Ecology
- BIO 260 Genetics and Molecular Biology
- BIO 310 General Physiology
- BIO 332 Cell Biology
- BIO 335 Microbiology
- BIO 361 Evolution and Biodiversity
- CHM 102 General Chemistry II
- CHM 215 Organic Chemistry I
- CHM 216 Organic Chemistry II
- CHM 217 Organic Chemistry Lab I
- CHM 350 Biochemistry
- PHY 101 General Physics I
- PHY 101L General Physics Laboratory I

**Major Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours as follows:

*Biology Elective Courses (minimum of 9 credit hours)*

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- BIO 330 Ecosystems Management
- BIO 341 Principles of Pharmacology
- BIO 355 Medical Parasitology
- BIO 371 Principles of Neuroscience
- BIO 394/494 special topic courses in biology
- BIO 421 Marine Environments
- BIO 461 Desert and Maritime Plants
- BIO 481 Cellular and Molecular Immunology
- BIO 491 Senior Project I
- BIO 492 Senior Project II

*Biology-Related Elective Courses*

Students can choose to complete a maximum of six credit hours in courses selected from the following list:

- CHM 242 Quantitative Analysis
- CHM 243 Quantitative Analysis Laboratory
- CHM 315 Organic Chemistry III
- CHM 345 Instrumental Analysis
- CHM 382 Forensic Chemistry
- CHM 394/494 approved special topic courses in chemistry. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- ENV 201 Fundamentals of Environmental Science
- ENV 352 Environmental Toxicology
- ENV 354 Assessment and Management of Environmental Impacts
- ENV 394/494 approved special topic courses in environmental sciences. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- ENV 451 Waste Treatment

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. In meeting this requirement, the graduate-level courses must comply with the major electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours of free electives selected from courses at the 100 level or above, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Biology (BSB)**

| FIRST YEAR (28 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 101 | General Biology I | 4 |
| | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **14** |
| Spring | BIO 102 | General Biology II | 4 |
| | CHM 102 | General Chemistry II | 4 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **14** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 260 | Genetics and Molecular Biology | 4 |
| | CHM 215 | Organic Chemistry I | 3 |
| | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | | **Total** | **14** |
| Spring | BIO 210 | Introduction to Human Anatomy and Physiology | 3 |
| | BIO 251 | Ecology | 3 |
| | CHM 216 | Organic Chemistry II | 3 |
| | CHM 217 | Organic Chemistry Laboratory I | 1 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **16** |

| THIRD YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 335 | Microbiology | 4 |
| | MJE | Major Elective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Spring | BIO 332 | Cell Biology | 3 |
| | CHM 350 | Biochemistry | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| FOURTH YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 310 | General Physiology | 3 |
| | BIO 361 | Evolution and Biodiversity | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MJE | Major Elective | 4 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |

## Bachelor of Science in Chemistry (BSC)

The mission of the Bachelor of Science in Chemistry program is to provide graduates with technical and problem-solving skills in an exciting and central area of scientific knowledge. Graduates will be prepared to pursue careers in industry, consulting, teaching and research.

### Program Goals

The Bachelor of Science in Chemistry program seeks to:

- provide students with an integrated knowledge of contemporary principles and applications of chemistry that will prepare them for advanced degrees and careers in teaching, research, industry, education and business
- provide a high-quality, laboratory-rich learning environment where students will learn proper laboratory protocols, plan and conduct experiments in various areas of chemistry, practice the scientific method, analyze data, and reach logical and reasonable conclusions
- provide opportunities for interested and qualified students to participate in meaningful and significant research projects of their own, under the guidance of the chemistry faculty
- maintain a dynamic curriculum that reflects the needs of a changing world
- foster motivation and opportunities for lifelong learning

### Program Outcomes

Upon graduation from the Bachelor of Science in Chemistry program, students will be able to:

- gain practical, experience-based learning
- apply technologies and use advanced chemical instrumentation such as nuclear magnetic resonance (NMR), high pressure liquid chromatography (HPLC), inductively coupled plasma spectrometry (ICP) and Fourier-transform infrared spectrometry (FTIR)
- identify and carry out thoughtful approaches to chemistry-related problems, including ethical issues and the proper disposal of chemical waste
- develop competence in critical thinking, communications, teamwork, information technology and adaptation to change
- produce written and oral reports using resources found in the scientific literature

### Career Opportunities

Chemists have the ability to work in a wide range of industries such as the following: agricultural companies, chemical distributors, chemical laboratories, chemical manufacturing plants, chemistry consulting firms, cosmetic companies, food and beverage companies, government, health protection branches, hospital research laboratories, industrial laboratories, mineral and metal industries, oil companies, petroleum refineries, pharmaceutical/biotechnology industries, police laboratories, pulp and paper industries, quality control laboratories, research centers/institutes, textile manufacturers and waterworks departments.

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the following conditions:

- a cumulative grade point average (CGPA) of 2.00
- a minimum grade of C- (1.70) in at least 18 credit hours from the following list of required first-year-level science and mathematics courses: CHM 101, CHM 102, PHY 101, PHY 101L, PHY 102, PHY 102L, MTH 103, MTH 104.

AUS students transferring into the program must meet the formal admission requirements listed above. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

To qualify for graduation with a Bachelor of Science in Chemistry, students must successfully complete the following minimum requirements:

- a minimum of 123 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 55 credit hours of major requirements
  - a minimum of 9 credit hours of major electives
  - a minimum of 15 credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103
- statistics requirement: STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through ENV 252
- discipline-specific writing intensive course requirement: satisfied through CHM 335
- oral proficiency requirement: satisfied through CHM 335
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through STA 201

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (55 credit hours)**

- CHM 102 General Chemistry II
- CHM 215 Organic Chemistry I
- CHM 216 Organic Chemistry II
- CHM 217 Organic Chemistry Laboratory I
- CHM 218 Organic Chemistry Laboratory II
- CHM 221 Basic Concepts of Inorganic Chemistry
- CHM 242 Quantitative Analysis
- CHM 243 Quantitative Analysis Laboratory
- CHM 315 Organic Chemistry III
- CHM 321 Chemistry of Transition Metals
- CHM 330 Physical Chemistry I
- CHM 331 Physical Chemistry II
- CHM 335 Physical Chemistry Laboratory
- CHM 345 Instrumental Analysis
- CHM 350 Biochemistry
- CHM 416 Systematic Identification of Organic Compounds
- ENV 252 Environmental Chemistry
- MTH 104 Calculus II
- MTH 205 Differential Equations
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II

**Major Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- CHE 436 Natural Gas Processing
- CHE 467 Corrosion
- CHE 494 approved special topic courses in chemical engineering. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- CHM 332 Physical Chemistry III
- CHM 382 Forensic Chemistry
- CHM 394/494 special topic courses in chemistry
- CHM 415 Spectroscopy in Organic Chemistry
- CHM 431 Biophysical Chemistry
- CHM 491 Senior Research Project I
- CHM 492 Senior Research Project II
- ENV 352 Environmental Toxicology
- ENV 353 Soil and Water Chemistry
- ENV 451 Waste Treatment
- ENV 453 Environmental Monitoring and Analysis Techniques

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours of free electives selected from courses at the 100 level or above, excluding MTH 101, with a minimum of 3 credit hours in courses at the 300 level or above.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Chemistry (BSC)**

| FIRST YEAR (28 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | GER-COM | Communication | 3 |
| | | **Total** | **14** |
| Spring | CHM 102 | General Chemistry II | 4 |
| | MTH 104 | Calculus II | 3 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | GER-COM | Communication | 3 |
| | | **Total** | **14** |

| SECOND YEAR (32 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 215 | Organic Chemistry I | 3 |
| | CHM 242 | Quantitative Analysis | 3 |
| | CHM 243 | Quantitative Analysis Laboratory | 1 |
| | MTH 205 | Differential Equations | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **16** |
| Spring | CHM 216 | Organic Chemistry II | 3 |
| | CHM 217 | Organic Chemistry Laboratory I | 1 |
| | CHM 221 | Basic Concepts of Inorganic Chemistry | 3 |
| | CHM 345 | Instrumental Analysis | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **16** |

| THIRD YEAR (32 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 218 | Organic Chemistry Laboratory II | 1 |
| | CHM 315 | Organic Chemistry III | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Spring | CHM 330 | Physical Chemistry I | 3 |
| | CHM 335 | Physical Chemistry Laboratory | 3 |
| | CHM 416 | Systematic Identification of Organic Compounds | 1 |
| | ENV 252 | Environmental Chemistry | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MJE | Major Elective | 3 |
| | | **Total** | **16** |

| FOURTH YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 321 | Chemistry of Transition Metals | 4 |
| | CHM 331 | Physical Chemistry II | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Spring | CHM 350 | Biochemistry | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Bachelor of Science in Environmental Sciences (BSES)

The mission of the Bachelor of Science in Environmental Sciences program is to provide graduates with qualifications for meaningful employment in the ever-expanding environmental field. This multidisciplinary program integrates biology, chemistry and other related sciences so as to enable students to identify and understand environmental issues and devise solutions.

### Program Goals

The Bachelor of Science in Environmental Sciences program seeks to:

- provide students with an integrated knowledge of contemporary principles and applications of environmental science that will prepare them for advanced degrees and careers in research, industry, education and business
- provide a high-quality, laboratory-rich learning environment where students will learn proper laboratory protocols, plan and conduct experiments, practice the scientific method, analyze data, and reach logical and reasonable conclusions
- provide opportunities for interested and qualified students to participate in meaningful research projects of their own, under the guidance of the environmental sciences faculty
- provide students with adequate background in the basic natural sciences, which will form the basis for their environmental studies
- foster motivation and opportunities for lifelong learning
- maintain a dynamic curriculum that reflects the needs of a changing world
- present students with opportunities for awareness of environmental issues within a global context

### Program Outcomes

Upon graduation from the Bachelor of Science in Environmental Sciences program, students will be able to:

- gain practical, experience-based learning
- gain ability to work as a research team member and become proficient in the use of advanced equipment used in environmental analysis, including gas chromatography (GC), high pressure liquid chromatography (HPLC), ion chromatography (IC) and inductively coupled plasma spectrometry (ICP)
- evaluate and discuss sources of local and regional environmental threats and perform impact assessment studies
- demonstrate knowledge of the fundamentals of environmental modeling, environmental monitoring techniques and risk assessment
- evaluate the ethical, social, civic, cultural and political dimensions as they relate to environmental issues
- produce written and oral reports using resources found in the scientific literature

*Concentration in Environmental Chemistry and Analysis*

Upon graduation from the Bachelor of Science in Environmental Sciences program with a Concentration in Environmental Chemistry and Analysis, students will be able to:

- critically evaluate and analyze scientific journal articles in the environmental chemistry discipline, and relate information to current environmental issues
- evaluate and discuss the physical and chemical properties of organic and inorganic chemicals in the environment
- apply proficiency in the use of advanced equipment that are related to environmental chemistry and analyze and interpret data using advanced analytical tools such as scanning electron microscopy-energy dispersive X-ray spectroscopy, mass spectrometry, ultraviolet–visible spectroscopy, atomic absorption spectrophotometer, total organic carbon analyzer, nuclear magnetic resonance, thermal desorption-gas chromatograph-mass spectrometer, and thermogravimetric analyzer
- identify and apply approaches to environmental chemistry-related problems, including the treatment and disposal of wastewater and solid waste, soil and water quality, and issues related to environmental health, food security and climate change

*Concentration in Environmental Biology and Ecosystems*

Upon graduation from the Bachelor of Science in Environmental Sciences program with a Concentration in Environmental Biology and Ecosystems, students will be able to:

- critically evaluate and analyze scientific journal articles in the environmental biosciences discipline and relate information to current environmental issues
- evaluate and discuss sources of local, regional and global threats to biodiversity, ecosystem services, conservation, and management
- utilize standard laboratory and field methods to understand ecological and human health issues such as infectious diseases, air, water and food contaminants, and climate change; and apply proficiency in the use of different biological techniques, such as the use of Polymerase Chain Reaction (PCR) for genotyping and for forensic DNA profiling
- demonstrate an understanding of the fundamentals of molecular, cellular and ecological techniques and instrumentation to develop solutions to environmental health and biodiversity issues

**Career Opportunities**

Recent events and current issues have raised major concerns related to the preservation of the environment. Local governments and private industries have begun to recognize the importance of conservation, recycling and environmental awareness. The Bachelor of Science in Environmental Sciences program at American University of Sharjah gives students an understanding of these issues, the skills needed to function as an environmental science professional and the necessary undergraduate education to pursue a graduate program in environmental sciences. Environmental scientists, biologists, chemists and physicists participate in the instruction of the core and concentration requirements for this major.

Environmental scientists can work in four general areas:

- environmental protection, which targets air, water and land quality and often has a human and environmental health and safety perspective
- conservation and protection of natural resources, which deal both with park, fisheries and wildlife management and the operation of resource-based industries such as oil, mining, forestry and agriculture
- environmental education and communications, which are relevant to both the public and private sectors
- environmental research, which includes developing analytical methods for detecting environmental pollutants and improving prediction of environmental and geophysical changes. Job opportunities are available in public and academic-supported research facilities.

Employers of environmental scientists include government, the natural resources sector, utilities, manufacturers and industry, as well as small business. Governments at all levels need environmental scientists in the areas of enforcing regulations, writing public information, writing and researching regulations, and ensuring government departmental compliance with existing regulations. The natural resource/utility sector (i.e., oil, mining, forestry, agriculture and hydro) is interested in having environmental scientists consult on the sustainability of their operations; monitor and mitigate environmental effects on wildlife, fisheries, the watershed and natural beauty; and advise them on liability issues. Manufacturers (particularly those involved in the production of chemicals, plastics, paints, pesticides, etc.) employ environmental scientists due to concerns that include smokestack specifications and volatile emissions, wastewater quality, minimization and disposal of hazardous waste, and health and safety issues. The service sector, including banks, real estate companies, lawyers and insurance companies, also relies on environmental scientists to accurately describe environmental risk so that they can assess potential liability. Businesses have been formed that service all these sectors in such areas as environmental impact consulting, compliances, recycling and waste management.

Currently, most work in the environmental sector is responsive to existing or anticipated problems, such as treating or monitoring effluent or gaseous emissions; preparing environmental impact statements, assessments and audits as required by law; conducting land reclamation and remediation; and completing public consultations. People with an entrepreneurial inclination to take a proactive approach to environmental stewardship and sustainable development have the opportunity to innovate current practices. There are ample prospects for individuals to generate inventions and ideas that would fundamentally change the way business, society and technology function through the creation of realistic alternatives to environmentally hazardous practices.

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the following conditions:

- a cumulative grade point average (CGPA) of 2.00
- a minimum grade of C- (1.70) in at least 18 credit hours from the following list of required first-year-level science and mathematics courses: BIO 101, CHM 101, CHM 102, PHY 101, PHY 101L, MTH 103, MTH 104

AUS students transferring into the program must meet the formal admission requirements listed above. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

Environmental sciences majors must choose among the following options:

- a concentration in environmental biology and ecosystems
- a concentration in environmental chemistry and analysis
- a double concentration in the two areas above

## Degree Requirements

To qualify for graduation with a Bachelor of Science in Environmental Sciences, students must successfully complete the following minimum requirements:

- a minimum of 123 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 37 credit hours of major requirements
  - a minimum of 27 credit hours of concentration requirements and concentration electives
  - a minimum of 15 credit hours of free electives in courses at the 100 level or above, excluding MTH 101
  - a minimum of five weeks or 200 hours of a full-time, satisfactory internship in environmental sciences with a business or governmental organization
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the concentration electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101 and CHM 102
- mathematics requirement: MTH 103
- statistics requirement: STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or in 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through ENV 491
- discipline-specific writing intensive course requirement: satisfied through ENV 491
- oral proficiency requirement: satisfied through ENV 491
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through STA 201

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (37 credit hours)**

*Basic Mathematics and Sciences (11 credit hours)*

- BIO 101 General Biology I
- MTH 104 Calculus II
- PHY 101 General Physics I
- PHY 101L General Physics Laboratory I

*Core Requirements (26 credit hours)*

- CHM 215 Organic Chemistry I
- CHM 217 Organic Chemistry Laboratory I
- CHM 242 Quantitative Analysis
- CHM 243 Quantitative Analysis Laboratory
- CHM 345 Instrumental Analysis
- ENV 201 Fundamentals of Environmental Science
- ENV 311 Environmental Modeling
- ENV 354 Assessment and Management of Environmental Impacts
- ENV 453 Environmental Monitoring and Analysis Techniques
- ENV 491 Senior Research Project
- ENV 497 Internship in Environmental Science

**Concentration in Environmental Biology and Ecosystems (minimum of 27 credit hours)**

*Concentration Requirements (18 credit hours)*

- BIO 102 General Biology II
- BIO 251 Ecology
- BIO 260 Genetics and Molecular Biology
- BIO 335 Microbiology
- BIO 361 Evolution and Biodiversity

*Concentration Electives (minimum of 9 credit hours)*

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- BIO 330 Ecosystems Management
- BIO 341 Principles of Pharmacology
- BIO 355 Medical Parasitology
- BIO 371 Principles of Neuroscience
- BIO 394/494 special topic courses in biology
- BIO 421 Marine Environments
- BIO 461 Desert and Maritime Plants
- CHM 216 Organic Chemistry II
- CHM 218 Organic Chemistry Laboratory II
- CHM 221 Basic Concepts of Inorganic Chemistry
- CHM 350 Biochemistry
- CHM 382 Forensic Chemistry
- CHM 394/494 approved special topic courses in chemistry. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- ENV 252 Environmental Chemistry
- ENV 261 Physical Geography
- ENV 352 Environmental Toxicology
- ENV 353 Soil and Water Chemistry
- ENV 394/494 special topic courses in environmental sciences
- ENV 451 Waste Treatment
- EWE 331 Introduction to Environmental and Water Engineering
- EWE 333 Water Quality and Treatment
- UPL 302 Analysis of Spatial Phenomena

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the concentration electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Environmental Sciences (BSES)**
*Concentration: Environmental Biology and Ecosystems*

| FIRST YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 101 | General Biology I | 4 |
| | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **14** |
| Spring | BIO 102 | General Biology II | 4 |
| | CHM 102 | General Chemistry II | 4 |
| | ENV 201 | Fundamentals of Environmental Science | 3 |
| | MTH 104 | Calculus II | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **17** |

| SECOND YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 260 | Genetics and Molecular Biology | 4 |
| | CHM 215 | Organic Chemistry I | 3 |
| | CHM 242 | Quantitative Analysis | 3 |
| | CHM 243 | Quantitative Analysis Laboratory | 1 |
| | GER-COM | Communication | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **17** |
| Spring | BIO 251 | Ecology | 3 |
| | CHM 217 | Organic Chemistry Laboratory I | 1 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | CNE | Concentration Elective | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **14** |

| THIRD YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 335 | Microbiology | 4 |
| | BIO 361 | Evolution and Biodiversity | 3 |
| | ENV 311 | Environmental Modeling | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | | **Total** | **16** |
| Spring | CHM 345 | Instrumental Analysis | 3 |
| | ENV 354 | Assessment and Management of Environmental Impacts | 3 |
| | CNE | Concentration Elective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | ENV 497 | Internship in Environmental Science | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENV 453 | Environmental Monitoring and Analysis Techniques | 3 |
| | ENV 491 | Senior Research Project | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | CNE | Concentration Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

**Concentration in Environmental Chemistry and Analysis (minimum of 27 credit hours)**

*Concentration Requirements (15 credit hours)*

- CHM 221 Basic Concepts of Inorganic Chemistry
- CHM 330 Physical Chemistry I
- ENV 252 Environmental Chemistry
- ENV 353 Soil and Water Chemistry
- ENV 451 Waste Treatment

*Concentration Electives (minimum of 12 credit hours)*

Students must successfully complete a minimum of 12 credit hours in courses selected from the following list:

- BIO 335 Microbiology
- BIO 341 Principles of Pharmacology
- BIO 394/494 approved special topic courses in biology. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- CHE 461 Air Pollution
- CHE 467 Corrosion
- CHE 472 Water and Wastewater Treatment Design
- CHM 216 Organic Chemistry II
- CHM 218 Organic Chemistry Laboratory II
- CHM 321 Chemistry of Transition Metals
- CHM 331 Physical Chemistry II
- CHM 335 Physical Chemistry Laboratory
- CHM 350 Biochemistry
- CHM 382 Forensic Chemistry
- CHM 394/494 special topic courses in chemistry
- CVE 341 Water Resources Engineering
- CVE 351 Environmental Engineering
- ENV 261 Physical Geography
- ENV 352 Environmental Toxicology
- ENV 394/494 special topic courses in environmental sciences
- EWE 331 Introduction to Environmental and Water Engineering
- EWE 333 Water Quality and Treatment
- UPL 302 Analysis of Spatial Phenomena

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the concentration electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Environmental Sciences (BSES)**
*Concentration: Environmental Chemistry and Analysis*

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 101 | General Biology I | 4 |
| | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **14** |
| Spring | CHM 102 | General Chemistry II | 4 |
| | ENV 201 | Fundamentals of Environmental Science | 3 |
| | MTH 104 | Calculus II | 3 |
| | GER-COM | Communication | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **16** |

| SECOND YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 215 | Organic Chemistry I | 3 |
| | CHM 242 | Quantitative Analysis | 3 |
| | CHM 243 | Quantitative Analysis Laboratory | 1 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | GER-COM | Communication | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **17** |
| Spring | CHM 217 | Organic Chemistry Lab I | 1 |
| | CHM 221 | Basic Concepts of Inorganic Chemistry | 3 |
| | ENV 252 | Environmental Chemistry | 3 |
| | CNE | Concentration Elective | 3 |
| | GER-COM | Communication | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **16** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENV 311 | Environmental Modeling | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | CNE | Concentration Elective | 3 |
| | CNE | Concentration Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Spring | CHM 330 | Physical Chemistry I | 3 |
| | CHM 345 | Instrumental Analysis | 3 |
| | ENV 354 | Assessment and Management of Environmental Impacts | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | ENV 497 | Internship in Environmental Science | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENV 353 | Soil and Water Chemistry | 3 |
| | ENV 453 | Environmental Monitoring and Analysis Techniques | 3 |
| | ENV 491 | Senior Research Project | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ENV 451 | Waste Treatment | 3 |
| | CNE | Concentration Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

**Double Concentration in Environmental Biology and Ecosystems, and Environmental Chemistry and Analysis**

Students must fulfill the requirements of both concentrations, as detailed in the respective previous sections. Courses used to fulfill the requirements of the first concentration can double count toward the second concentration. Once the degree requirements are met, any shortage in credit hours may be fulfilled by free electives. Double-concentration students generally require more than 123 credit hours to meet graduation requirements.

## Minor in Biology

A minor in biology trains students in the most important aspects of ecology and genetics, which makes them better qualified to enter professions that require knowledge of living organisms and the interaction of organisms with the environment.

Students enrolling in the biology minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in biology must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - eight credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 20 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

The minor is not open to environmental sciences students in the environmental biology and ecosystems concentration.

**Minor Requirements (8 credit hours)**

Students must successfully complete the following courses:

- BIO 101 General Biology I
- BIO 102 General Biology II

**Minor Electives (minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in courses selected from the following list, with a minimum of nine credit hours in courses at the 300 level or above:

- BIO 210 Introduction to Human Anatomy and Physiology
- BIO 251 Ecology
- BIO 260 Genetics and Molecular Biology
- BIO 310 General Physiology
- BIO 330 Ecosystems Management
- BIO 332 Cell Biology
- BIO 335 Microbiology
- BIO 341 Principles of Pharmacology
- BIO 355 Medical Parasitology

- BIO 361 Evolution and Biodiversity
- BIO 371 Principles of Neuroscience
- BIO 394/494 special topic courses in biology
- BIO 421 Marine Environments
- BIO 461 Desert and Maritime Plants
- BIO 481 Cellular and Molecular Immunology
- CHM 350 Biochemistry

### Minor in Environmental Policy

This interdisciplinary minor draws on the resources and expertise of several departments.

Students enrolling in the environmental policy minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in environmental policy must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- ENV 100 Principles of Environmental Science or ENV 201 Fundamentals of Environmental Science
- ENV 354 Assessment and Management of Environmental Impacts
- POL 201 Introduction to Political Studies

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list, with a minimum of six credit hours in courses at the 300 level or above:

- BIO 330 Ecosystems Management
- ECO 404 Economics of Environmental and Natural Resources
- ENV 294/394/494 special topic courses in environmental sciences
- MGT 317 Management for Sustainability
- PHI 309 Ethics and the Environment
- POL 304 International Organizations
- POL 305 Public International Law
- SOC 302 Environmental Sociology
- SOC 380 Urban Sociology
- any approved special topic courses at the 300 level or above not used as minor requirements. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

### Minor in Environmental Sciences

This minor draws on the resources and expertise of several disciplines.

Students enrolling in the environmental sciences minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in environmental sciences must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- ENV 201 Fundamentals of Environmental Science
- ENV 354 Assessment and Management of Environmental Impacts
- any 200-level or above ENV courses

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list, with a minimum or six credit hours in courses at the 300 level or above:

- BIO 330 Ecosystems Management
- BIO 335 Microbiology
- CHE 461 Air Pollution
- CHE 467 Corrosion
- CHE 472 Water and Wastewater Treatment Design
- CHM 345 Instrumental Analysis
- any 200-level or above ENV course not used as a minor requirement
- any approved special topic courses at the 300 level or above not used as minor requirements. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Department of English

Roger Nunn, Head

**Faculty**

Alaanoud Abusalim
Maya Aghasi
Khawlah Ahmed
Adnan Ajšić
Ahmad Al-Issa
Maher Bahloul
Neslihan Bilikozen
Randa Bou-Mehdi
Rachel Buck
Laurence Craven
Brad Curabba
Hoda El Bakhour
Maria Eleftheriou
Tharwat El-Sakran
Jana Fedtke
Daniel Fredrick
Neena Gandhi
Nawar Al-Hassan Golley
Tammy Gregersen
Kristen Highland
Christopher Horger
Brian McAllister
Philip McCarthy
Suzan Munday
Özgür Parlak
Marija Reiff
Sana Sayed
Aisha Sayidina
Ji Young Shim
Greg Vanderpyl
Christopher Weagle

The mission of the Department of English is based on a liberal arts approach to education that aims to prepare students academically in English language and literature. The department offers a Bachelor of Arts in English Language and Literature with concentrations in language or literature. The Department of English also offers minors in English language and English

literature, in addition to a Master of Arts degree in Teaching English to Speakers of Other Languages (TESOL). For more details on the master's degree, please refer to the *AUS Graduate Catalog*.

Students taking courses in literature and language learn to analyze global intellectual and cultural traditions, ideals and values in order to enhance self-understanding and empathy for others. They study the ways that societies are defined in relation to culture, nationality, race, ethnicity and gender. They learn to analyze and explain implied and expressed cultural values and attitudes in works of literature, and to explain the development of human institutions, ideas and social structures. Literature and (applied) linguistics courses are also related to the social sciences, elucidating ideas in sociology, psychology, history, language theory, political science and cultural studies.

The Department of English teaches courses to satisfy the AUS General Education Program core requirements, in addition to academic and professional writing. Academic and professional writing courses focus on different rhetorical principles such as audience, context and purpose that build a foundation for future professional and academic reading and writing tasks.

## Bachelor of Arts in English Language and Literature (BAELL)

The mission of the Bachelor of Arts in English Language and Literature program is to provide students with a broad knowledge of the ways in which literature explores the human experience and how language conveys meaning, preparing students for careers in such diverse fields as publishing, teaching and professional writing, as well as in the public sector and corporate world, and for graduate study. In addition, the major program in English provides relevant preparation for students interested in the future study of law and education.

**Program Goals**

The goals of the Bachelor of Arts in English Language and Literature are to:

- provide knowledge of the linguistic structure of English and its literary use
- enable students to understand English within its historical, theoretical and cultural context
- provide students with insights into the complexity of human thought, emotion and interaction
- teach students the research tools, critical processes and analytical skills necessary for advanced study in diverse fields

*Concentration in English Language*

The goals of the concentration in English language are to:

- develop students' ability to analyze different components of language
- familiarize students with the theoretical models in linguistic study
- provide students with the skills to analyze the function and use of language
- promote an understanding of how language is used in literary texts
- develop students' linguistic research skills

*Concentration in English Literature*

The goals of the concentration in English literature are to:

- provide students with the skills to analyze the styles and elements of various genres
- promote an understanding of the exchange of ideas from one culture to another
- explore the philosophical and critical theories which underlie both the understanding and the writing of literature
- explain how ideas and literary styles change from one period to another in response to technological changes, historical events and philosophical concepts
- develop students' literary research skills

**Program Outcomes**

Upon graduation from the Bachelor of Arts in English Language and Literature program, students will be able to:

- analyze the structure of the English language
- demonstrate an understanding of the functions of dialogue, setting, voice, tone, atmosphere, narrative structure, imagery, rhythm and metaphor in creative prose
- explain the history and development of Modern English
- explain the interchange of ideas that led to such international literary movements as romanticism, realism, modernism, post-modernism and magic realism
- recognize the relationship between language, thought and culture
- apply and analyze various theoretical approaches to literature
- apply standard linguistic techniques for analysis and description of language and language use
- employ effective patterns of organization and research in all critical and creative work

*Concentration in English Language*

Upon graduation from the Bachelor of Arts in English Language and Literature program, students with a concentration in English language will be able to:

- analyze the phonological and morphemic structure of the English language
- analyze the syntactic and semantic structure of the English language
- understand that languages are rule governed
- demonstrate knowledge of major theoretical models in linguistics
- assess the power of language in interpersonal interactions
- evaluate how power relations affect language use in different contexts
- identify the contextual factors embedded in communicative events
- explain language change
- recognize the relation between language, thought and culture
- understand the exchange of ideas from one culture to another
- explain the specific rhetorical devices (irony, allusion, connotation) used to convey meaning and evoke emotion
- demonstrate an understanding of the functions of dialogue, setting, voice, tone, atmosphere, narrative structure, imagery, rhythm and metaphor in creative prose and poetry
- analyze the influence of non-Western literary and philosophical traditions on Anglophone literary culture
- employ field work methods to investigate language use in different settings and media
- apply standard linguistic techniques for analysis and description of language

*Concentration in English Literature*

Upon graduation from the Bachelor of Arts in English Language and Literature, program, students with a concentration in English literature will be able to:

- demonstrate an understanding of the functions of dialogue, setting, voice, tone, atmosphere, narrative structure, imagery, rhythm and metaphor in creative prose and poetry
- explain the specific rhetorical devices (irony, allusion, connotation) by which writers convey meaning and evoke emotion

- explain the ways in which the structure of a work, from the sentence level to the overall organization, expresses meaning
- analyze the syntactic and semantic structure of the English language
- explain language change
- recognize the relation between language, thought and culture
- explain the interchange of ideas that led to such international literary movements as romanticism, realism, modernism, post-modernism and magic realism
- analyze the influence of non-Western literary and philosophical traditions on Anglophone literary culture
- identify the effects of the colonial experience on the Anglophone literature of both the colonizers and the colonized
- explain the philosophies that led to the development of various literary theories
- apply various theoretical approaches to literature
- explain the difference between major literary movements and periods and their predecessors
- recognize the ways in which major writers were influenced by the ideas and events of their time
- demonstrate effective use of primary and secondary sources in writing about literature
- employ effective patterns of organization in all critical and creative work
- produce a comprehensive critical study revealing in-depth knowledge of an individual author, literary movement or theoretical approach

## Admission to the Program

Admission to the program follows the university's undergraduate admission requirements.

AUS students transferring into the program must have achieved a minimum cumulative GPA of 2.00. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

Students majoring in English language and literature must choose one of the following two concentrations:

- a concentration in English language
- a concentration in English literature

## Degree Requirements

To qualify for graduation with a Bachelor of Arts in English Language and Literature, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 18 credit hours of major requirements
  - a minimum of 21 credit hours in major electives for the language concentration and a minimum of 24 credit hours in major electives for the literature concentration
  - a minimum of 24 credit hours of concentration requirements for the language concentration and a minimum of 21 credit hours of concentration requirements for the literature concentration
  - a minimum of 15 credit hours of free electives selected in courses at the 100 level or above
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 39 credit hours)**

Students must successfully complete a minimum of 39 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours taken from the natural sciences area
- mathematics requirement: MTH 100 or MTH 101 or MTH 103 or MTH 111
- statistics requirement: STA 202
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through ENG 490
- discipline-specific writing intensive course requirement: satisfied through ENG 490
- oral proficiency requirement: satisfied through ENG 490
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through STA 202

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (18 credit hours)**

- ENG 210 Introduction to Literature
- ENG 215 Contemporary World Literature
- ENG 223 Introduction to Language Study
- ENG 224 English Grammar
- ENG 226 Development of the English Language
- one course from the British literature survey sequence:
  - ENG 308 British Literature Until 1600
  - ENG 309 British Literature: 1600–1800
  - ENG 310 Nineteenth Century British Literature
  - ENG 311 Twentieth Century British Literature

**Major Electives (minimum of 21/24 credit hours)**

Students in the language concentration must successfully complete a minimum of 21 credit hours. Students in the literature concentration must successfully complete a minimum of 24 credit hours. Courses can be chosen from:

- ENG 234 Language and Society
- any 300-level and above courses in education (EDU) and English (ENG) not listed as major requirements or concentration requirements in the student's chosen concentration
- TRA 401 Translation Evaluation and History
- WST 250 Women's Voices Across Cultures
- any approved special topic courses at the 300-level and above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**English Language Concentration Requirements (24 credit hours)**

- ENG 234 Language in Society or ENG 372 English and Globalization
- ENG 331 The Sound Patterns of Language
- ENG 332 The Psychology of Language
- ENG 334 Meaning in Language
- ENG 382 Language Variation in Media or ENG 405 Discourse Analysis
- ENG 401 Advanced English Grammar
- ENG 490 Senior Research Project
- ENG 495 Seminar in English

**Proposed Sequence of Study**
**Bachelor of Arts in English Language and Literature (BAELL)**
*Concentration: English Language*

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MTH 100 | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | STA 202 | Introduction to Statistics for Social Sciences | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ENG 210 | Introduction to Literature | 3 |
| | ENG 215 | Contemporary World Literature | 3 |
| | ENG 223 | Introduction to Language Study | 3 |
| | ENG 224 | English Grammar | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 226 | Development of the English Language | 3 |
| | ENG 234 or ENG 372 | Language in Society or English and Globalization | 3 |
| | ENG 308 or ENG 309 or ENG 310 or ENG 311 | British Literature Until 1600 or British Literature: 1600–1800 or Nineteenth Century British Literature or Twentieth Century British Literature | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MJE | Major Elective | 3 |
| | | **Total** | **15** |
| Spring | ENG 331 | The Sound Patterns of Language | 3 |
| | ENG 332 | The Psychology of Language | 3 |
| | ENG 334 | Meaning in Language | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | | **Total** | **15** |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 382 or ENG 405 | Language Variation in Media or Discourse Analysis | 3 |
| | ENG 401 | Advanced English Grammar | 3 |
| | ENG 495 | Seminar in English | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ENG 490 | Senior Research Project | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

**English Literature Concentration Requirements (21 credit hours)**

- ENG 214 Seventeenth to Nineteenth Century American Literature or ENG 314 Twentieth Century American Literature
- ENG 300 Introduction to Literary Theory
- ENG 303 Shakespeare's Plays or ENG 316 Modern Drama and Beyond
- one course from the British literature survey sequence not used as a major requirement:
  - ENG 308 British Literature Until 1600
  - ENG 309 British Literature: 1600–1800
  - ENG 310 Nineteenth Century British Literature
  - ENG 311 Twentieth Century British Literature
- ENG 410 The American Novel or ENG 421 Early English Novel or ENG 430 Modern British Novel
- ENG 490 Senior Research Project
- ENG 495 Seminar in English

**Proposed Sequence of Study**
**Bachelor of Arts in English Language and Literature (BAELL)**
*Concentration: English Literature*

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MTH 100 | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | STA 202 | Introduction to Statistics for Social Sciences | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing about Literature or Advanced Academic Writing | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ENG 210 | Introduction to Literature | 3 |
| | ENG 215 | Contemporary World Literature | 3 |
| | ENG 223 | Introduction to Language Study | 3 |
| | ENG 224 | English Grammar | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 214 or ENG 314 | Seventeenth to Nineteenth Century American Literature or Twentieth Century American Literature | 3 |
| | ENG 226 | Development of the English Language | 3 |
| | ENG 300 | Introduction to Literary Theory | 3 |
| | ENG 308 or ENG 309 or ENG 310 or ENG 311 | British Literature Until 1600 or British Literature: 1600–1800 or Nineteenth Century British Literature or Twentieth Century British Literature | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | | **Total** | **15** |
| Spring | ENG 303 or ENG 316 | Shakespeare's Plays or Modern Drama and Beyond | 3 |
| | ENG 308 or ENG 309 or ENG 310 or ENG 311 | British Literature Until 1600 or British Literature: 1600–1800 or Nineteenth Century British Literature or Twentieth Century British Literature | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | | **Total** | **15** |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 410 or ENG 421 or ENG 430 | The American Novel or Early English Novel or Modern British Novel | 3 |
| | ENG 495 | Seminar in English | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ENG 490 | Senior Research Project | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Minor in English Language

The minor in English language is for non-English language and literature students who are interested in the nature of language, the tool of communication that makes us human. It provides training in linguistic analysis and enhances students' cross-disciplinary interests in language-related issues.

A minor in English language:

- helps students to understand the history and structure of English
- helps students to understand the relationship between society and language
- equips students with the necessary tools to compare languages across cultures in a multilingual and multicultural world

Students enrolling in the English language minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in English language must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

This minor is not open to English language and literature students.

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- ENG 223 Introduction to Language Study
- ENG 224 English Grammar
- ENG 226 Development of the English Language or
  ENG 234 Language in Society

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- ENG 302 Stylistics
- ENG 331 The Sound Patterns of Language

- ENG 332 The Psychology of Language
- ENG 334 Meaning in Language
- ENG 372 English and Globalization
- ENG 382 Language Variation in Media
- ENG 385 Language and Gender
- ENG 394/494 approved special topic courses in linguistics. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- ENG 401 Advanced English Grammar
- ENG 405 Discourse Analysis
- ENG 490 Senior Research Project
- ENG 495 Seminar in English (focus on English language)

### Minor in English Literature

The minor in English literature enables non English language and literature students to experience the ways in which literature expands our knowledge of human nature and our capacity for empathy. It also provides rigorous training in closely reading literary texts; constructing complex, sophisticated arguments; and analyzing the nuances of language.

A minor in English literature:

- increases students' awareness of the complexity and diversity of the literary culture of the English-speaking world
- increases awareness of the origins of the literary traditions and beliefs that continue to shape and reflect the global English-speaking community

Students enrolling in the English literature minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in English literature must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

This minor is not open to English language and literature students.

**Minor Requirements (6 credit hours)**

Students must complete the following courses:

- ENG 210 Introduction to Literature
- ENG 215 Contemporary World Literature

**Minor Electives (minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in any four English literature courses at the 300 level or above. ENG 495, focus on literature, meets this requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Department of International Studies

Vernon Pedersen, Head

**Faculty**

Jais Adam-Troian
Pia-Kristina Anderson
Pernille Arenfeldt
Mark Aveyard
Sammy Zeyad Badran
Isa Blumi
Giacomo Chiozza
Arianne Conty
Sara Farhan
Kristina Katsos
Jeffrey King
Jeniece Lusk
Angela T. Maitner
Kurt Mertal
Chasity O'Connell
Juana Park
Matteo Salvadore
Bethany Shockley
Sundar Vadlamudi
Johannes Van Gorp
Eileen Walsh
Yuting Wang

The Department of International Studies offers opportunities to develop an appreciation for and fuller understanding of global issues within the context of a diverse multidisciplinary curriculum. Courses encourage students to develop a critical awareness of the ways in which global forces shape and transform regional, national, political, social, cultural and economic change.

## Bachelor of Arts in International Studies (BAIS)

Sharjah's history as an important trading center and cultural meeting place makes American University of Sharjah an especially appropriate place for international studies. The international studies program offers students the opportunity to prepare to take an active role in an increasingly complex global environment. The interdisciplinary program assists students in acquiring a broad understanding of world cultures, politics and history and prepares them for careers in government, business and with international organizations.

**Program Mission**

The Bachelor of Arts in International Studies program seeks to provide a foundation for assuming leadership roles in a wide variety of government, non-government, public policy, private and corporate organizations. Elective courses within the degree program encourage students to deepen their engagement with one or more of the areas introduced in the core requirements.

**Program Goals**

The Bachelor of Arts in International Studies program seeks to:

- provide an introduction to the disciplines that focus on how global forces influence political, social, cultural and economic change
- enable students to think critically about global issues from a variety of disciplinary perspectives
- provide opportunities to consider the place of the Middle East and the Arab world in international affairs and the study of international relations
- provide opportunities to prepare for careers in governmental and nongovernmental organizations
- create a challenging intellectual environment that encourages the development of the skills and abilities necessary for dealing with change in a global context

**Program Outcomes**

Upon graduation from the Bachelor of Arts in International Studies program, students will be able to:

- identify and explain the impact of key political, historical and cultural developments both globally and regionally
- demonstrate an understanding of the basic concepts, analytical perspectives and methodologies employed in the disciplines of anthropology, history, philosophy, political science and sociology

- evaluate source material for validity, accuracy and biases
- communicate effectively in writing and in oral presentations
- compare and contrast cultures and systems of value
- demonstrate an understanding of the importance of ethical behavior and social responsibility
- demonstrate the capacity for independent research

## Admission to the Program

Admission to the program follows the university's undergraduate admission requirements.

AUS students transferring into the program must have achieved a minimum cumulative GPA of 2.00. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

To qualify for graduation with a Bachelor of Arts in International Studies, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 45 credit hours in major requirements
  - a minimum of 15 credit hours in major electives
  - a minimum of 18 credit hours of free electives
  - a six-week internship in international studies (INS 497)
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 39 credit hours)**

Students must successfully complete a minimum of 39 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours taken from the natural sciences area
- mathematics requirement: MTH 100 or MTH 101 or MTH 103 or MTH 111
- statistics requirement: STA 202
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or in 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through PHI 208
- discipline-specific writing intensive course requirement: satisfied through INS 490
- oral proficiency requirement: satisfied through INS 490
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through STA 202 or MTH 103

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (45 credit hours)**

- ANT 205 World Cultures
- ECO 202 Principles of Macroeconomics
- HIS 217 The World in the Twentieth Century
- INS 120 Global Problems
- INS 300 Research Design and Source Analysis
- INS 301 Globalization
- INS 307 International Security
- INS 322 Global Political Economy
- INS 325 Imperialism
- INS 490 Senior Research Project
- INS 497 Internship in International Studies
- PHI 208 Modern Philosophy
- POL 201 Introduction to Political Studies
- POL 202 Introduction to International Relations
- POL 304 International Organizations
- SOC 201 Introduction to Sociology

**Major Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours of major electives selected in consultation with their advisor from courses at the 300 level or above. Electives may be any course from the following disciplines that is not a major requirement:

- anthropology
- economics
- environmental sciences
- history
- international studies
- philosophy
- political science
- psychology
- sociology

Students may also take approved interdisciplinary studies (IDS) courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 18 credit hours)**

Students must successfully complete a minimum of 18 credit hours of free electives selected from courses at the 100 level or above.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Arts in International Studies (BAIS)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | INS 120 | Global Problems | 3 |
| | MTH 100 | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | ANT 205 | World Cultures | 3 |
| | ECO 202 | Principles of Macroeconomics | 3 |
| | STA 202 | Introduction to Statistics for Social Sciences | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing About Literature or Advanced Academic Writing | 3 |
| | HIS 217 | The World in the Twentieth Century | 3 |
| | POL 201 | Introduction to Political Studies | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **15** |
| Spring | INS 300 | Research Design and Source Analysis | 3 |
| | PHI 208 | Modern Philosophy | 3 |
| | POL 202 | Introduction to International Relations | 3 |
| | SOC 201 | Introduction to Sociology | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | INS 301 | Globalization | 3 |
| | INS 307 | International Security | 3 |
| | POL 304 | International Organizations | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **15** |
| Spring | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | INS 322 | Global Political Economy | 3 |
| | INS 325 | Imperialism | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | | **Total** | **15** |
| Summer | INS 497 | Internship in International Studies | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | INS 490 | Senior Research Project | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Bachelor of Arts in Psychology (BAPSY)

### Program Mission

The Bachelor of Arts in Psychology program seeks to provide an evidence-based foundation of research and analytic skills in addition to broad academic knowledge in the field of psychology. The program facilitates a deep understanding of human behavior and experience, as well as professional skills that provide a firm foundation for careers in research, counseling, business, human services and other fields.

### Program Goals

The Bachelor of Arts in Psychology program aims to:

- provide students with knowledge of psychological theory, methodology and applications
- foster critical thinking and an ability to develop evidence-based arguments
- enhance students' academic communication and interpersonal skills
- provide students with the ability to use psychological knowledge and skills for professional and personal development
- help students develop a sense of cultural, social and ethical competence

### Program Outcomes

Upon graduation from the Bachelor of Arts in Psychology program, students will be able to:

- describe and apply key concepts, principles and overarching themes in psychology
- apply the research process and its underlying ethical standards in collecting, analyzing and interpreting data
- interpret, explain and evaluate scientific sources of information through evidence-based analyses, both verbally and in writing
- demonstrate the ability to apply psychological knowledge and skills to the development of personal and career goals
- demonstrate an understanding of social and cultural factors that influence human behavior

### Admission to the Program

Admission to the program follows the university's undergraduate admission requirements.

AUS students transferring into the program must have achieved a minimum cumulative GPA of 2.00. Students who do not meet the minimum cumulative GPA requirement must consult with the department. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

To qualify for graduation with a Bachelor of Arts in Psychology, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 27 credit hours of major requirements
  - a minimum of 27 credit hours of major electives
  - a minimum of 24 credit hours of free electives
  - a five-week internship in psychology
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 39 credit hours)**

Students must successfully complete a minimum of 39 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours taken from the natural sciences area, including BIO 103 or BIO 101
- mathematics requirement: MTH 100 or MTH 101 or MTH 103 or MTH 111
- statistics requirement: STA 202
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses meeting this requirement, including ENG 204
- ethical understanding requirement: satisfied through PSY 250
- discipline-specific writing intensive course requirement: satisfied through PSY 404
- oral proficiency requirement: satisfied through PSY 490
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through PSY 350

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (27 credit hours)**

- PSY 101 Introduction to Psychology
- PSY 102 Social Psychology
- PSY 250 Research Methods I
- PSY 350 Research Methods II
- Clinical and Biopsychology Requirement:
  - PSY 301 Abnormal Psychology or
  - PSY 303 Health Psychology or
  - PSY 311 Biopsychology
- Culture Requirement:
  - PSY 321 Cultural Psychology or
  - PSY 322 Stereotypes, Prejudice and Discrimination or
  - PSY 323 Psychology of Religion
- PSY 397 Internship in Psychology
- PSY 403 Personal and Professional Development
- PSY 404 History and Systems
- PSY 490 Research Design

**Major Electives (minimum of 27 credit hours)**

Students must successfully complete a minimum of 27 credit hours of major electives selected in consultation with their advisor, with a minimum of 15 credit hours in courses at the 300 level or above. A minimum of 15 credit hours out of the 27 credit hours must be successfully completed in PSY courses not required for the major.

*PSY Electives*
*(minimum of 15 credit hours)*

- PSY 302 Developmental Psychology
- PSY 304 Personality Psychology
- PSY 305 Cognitive Psychology
- PSY 306 Organizational Psychology
- PSY 309 Psychology of Bilingualism
- PSY 312 Psychology of Creativity
- PSY 351 Psychology Research Experience

When not counted as major requirements, the following courses will also count as major electives:

- PSY 301 Abnormal Psychology
- PSY 303 Health Psychology
- PSY 311 Biopsychology
- PSY 321 Cultural Psychology
- PSY 322 Stereotypes, Prejudice and Discrimination
- PSY 323 Psychology of Religion
- PSY 394/494 approved special topic courses in psychology. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

*Non PSY Electives*

- ANT 205 World Cultures
- BIO 101 General Biology I
- BIO 102 General Biology II
- BIO 210 Introduction to Human Anatomy and Physiology
- BIO 260 Genetics and Molecular Biology
- BIO 341 Principles of Pharmacology
- BIO 361 Evolution and Biodiversity
- BIO 371 Principles of Neuroscience
- ECO 201 Principles of Microeconomics
- ECO 202 Principles of Macroeconomics
- ECO 301 Intermediate Microeconomics
- ECO 351 Introduction to Econometrics
- MCM 222 Principles of Integrated Marketing Communications
- MGT 201 Fundamentals of Management
- MGT 301 Organizational Behavior
- MKT 201 Fundamentals of Marketing
- MKT 301 Consumer Behavior
- MTH 350 Introduction to Probability
- POL 201 Introduction to Political Studies
- POL 202 Introduction to International Relations
- SOC 201 Introduction to Sociology
- STA 233 Introduction to Survey Sampling and Analysis

**Free Electives (minimum of 24 credit hours)**

Students must successfully complete a minimum of 24 credit hours of free electives selected from courses at the 100 level or above.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Arts in Psychology (BAPSY)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | BIO 103 | Introduction to Human Biology | 3 |
| | PSY 101 | Introduction to Psychology | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-MTH | Mathematics | 3 |
| | | **Total** | **15** |
| Spring | PSY 102 | Social Psychology | 3 |
| | PSY 250 | Research Methods I | 3 |
| | STA 202 | Introduction to Statistics for Social Sciences | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 204 | Advanced Academic Writing | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-COM | Communication | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | PSY 301 or PSY 303 or PSY 311 | Abnormal Psychology or Health Psychology or Biopsychology | 3 |
| | PSY 350 | Research Methods II | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | PSY 321 or PSY 322 or PSY 323 | Cultural Psychology or Stereotypes, Prejudice and Discrimination or Psychology of Religion | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | PSY 397 | Internship in Psychology | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | PSY 403 | Personal and Professional Development | 3 |
| | PSY 490 | Research Design | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | PSY 404 | History and Systems | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Minor in History

The minor in history enables students to encounter the academic exploration of humanity's past. Students are introduced to both ancient and modern history, and they will also investigate both global and regional history. The minor also provides students with basic comprehension of historical method by exposing them to the sustained study of primary sources and theories of historical interpretation and by requiring them to become cognizant of independent historical research.

Students enrolling in the history minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in history must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- HIS 205 World History I: Ancient and Medieval Worlds
- HIS 206 World History II: The Modern World
- Students will take one of the following regional options:
  - HIS 204 Modern Arab History
  - HIS 210 The Making of Modern Europe
  - HIS 240 Introduction to American History

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- any HIS courses at the 300 level or above
- INS 300 Research Design and Source Analysis
- INS 320 Human Rights in World Politics
- INS 325 Imperialism
- INS 340 Fascism and the Populist Radical Right in Europe
- INS 365 Disease and Disaster in History
- INS 415 War and Peace in the Middle East

- INS 420 Social Theory
- POL 310 The European Union and the Politics of Integration
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in International Studies

The minor in international studies introduces students to the interdisciplinary exploration of social issues at the individual, local, national, international and global levels. Theoretical and applied aspects of citizenship, civil society, governance and the domestic/international interface are explored in a variety of societal and organizational contexts.

Students enrolling in the international studies minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in international studies must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- ANT 205 World Cultures or GEO 201 World Cultural Geography or SOC 201 Introduction to Sociology
- HIS 205 World History I: Ancient and Medieval Worlds or HIS 206 World History II: The Modern World or PHI 201 Introduction to Philosophy
- POL 201 Introduction to Political Studies

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- INS 300 Research Design and Source Analysis
- INS 301 Globalization
- INS 307 International Security
- INS 320 Human Rights in World Politics
- INS 322 Global Political Economy
- INS 325 Imperialism
- INS 330 Women and Politics
- INS 340 Fascism and the Populist Radical Right in Europe
- INS 350 Moot Court
- INS 365 Disease and Disaster in History
- INS 420 Social Theory
- POL 300 Comparative Politics
- POL 304 International Organizations
- POL 305 Public International Law
- POL 309 The American Political System
- POL 310 The European Union and the Politics of Integration
- POL 408 Comparative Politics of the Middle East and North Africa
- POL 409 Politics and Civil Society in the Middle East
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Philosophy

The philosophy minor develops students' natural reasoning. It also introduces students to the unanswered questions of the Western, Middle Eastern and Eastern traditions of wisdom.

Students enrolling in the philosophy minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in philosophy must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- PHI 201 Introduction to Philosophy
- PHI 202 Introduction to Islamic Philosophy
- one of the following:
  - PHI 204 Ethics for Professionals
  - PHI 206 Ethics and Information Technology
  - CMP 235 Ethics for Computing and Information Technology

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- ARA 402 Qur'anic Studies
- INS 350 Moot Court
- INS 420 Social Theory
- PHI 303 Political Philosophy
- PHI 304 Themes in Western Thought
- PHI 305 Advanced Social Political Philosophy
- PHI 306 Philosophy of Law
- PHI 309 Ethics and the Environment
- PHI 310 Islamic Political Philosophy
- PSY 305 Cognitive Psychology
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Psychology

The minor in psychology develops students' sense of the psychological processes underlying people's behavior. It also introduces students to the theories and practices of experimental and clinical psychology, which prepares them for graduate work in various fields.

Students enrolling in the psychology minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in psychology must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (6 credit hours)**

Students must successfully complete the following courses:

- PSY 101 Introduction to Psychology
- PSY 250 Research Methods I

**Minor Electives (minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in PSY courses at the 200 level or above, with a minimum of nine credit hours at the 300 level or above.

### Minor in Women's Studies

Nawar Al-Hassan Golley, Coordinator

The minor in women's studies aspires to promote an understanding of women's achievements, contributions and experiences in their historical and social contexts. Women's studies courses provide students with opportunities to critically analyze theoretical frameworks related to women but within multicultural and multidisciplinary contexts.

Students seeking a minor in women's studies must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- HIS 208 Women in History
- WST 240 Introduction to Women's Studies
- WST 250 Women's Voices Across Cultures

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- ENG 385 Language and Gender
- HIS 340 History of the Family
- INS 300 Research Design and Source Analysis
- INS 330 Women and Politics
- MCM 392 Women and Film
- MUS 302 Women and the Performing Arts
- SOC 370 Women's Empowerment and International Development
- any WST course at the 300 level or above
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Department of Mass Communication

Mohammad Ayish, Head

**Faculty**

Abeer Al-Najjar
Harris Breslow
Suheil Dahdal
Ana Milena Gavassa
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## Bachelor of Arts in Mass Communication (BAMC)

The Bachelor of Arts in Mass Communication supports the AUS mission by providing students with knowledge and practice in the discipline of mass communication to serve the needs of the region and to encourage students' professional and personal growth and development.

Following international standards for similar mass communication models, the program has been adapted to the specific pedagogic and social challenges and requirements of the GCC region. The Department of Mass Communication strives to maintain close contact with its students and alumni to foster their personal and professional growth, maturity and their sense of social responsibility with particular reference to the profound social and cultural influence they will have as members of communications industries.

**Program Mission**

The Bachelor of Arts in Mass Communication degree program seeks to provide a balanced foundation of professional competencies involving digital storytelling, social media, integrated communications and academic knowledge of the discipline of mass communication in general and the department's specific professional concentrations in journalism and integrated marketing communications.

**Program Goals**

The Bachelor of Arts in Mass Communication program strives to:

- provide students with a grounding in the various perspectives found in the academic discipline of mass communication in its traditional and new digital formats, fostering students' critical and analytical faculties in mass communication
- furnish students with theoretical and strategic knowledge required of media professionals in the digital age
- equip graduates for competencies required for entry-level positions in the media industries

The Bachelor of Arts in Mass Communication program offers a blend of academic and professional training in two concentrations: integrated marketing communications and journalism. These programs strive to develop knowledge and skills in digital and multiplatform communications for their respective industries.

**Program Outcomes**

*Bachelor of Arts in Mass Communication*

Upon graduation from the Bachelor of Arts in Mass Communication program, students should be able to:

- articulate the dominant quantitative and qualitative research methods and paradigms found in the discipline of mass communication and employ these research methods in their professional careers
- demonstrate an understanding of the role that mass media (including new

digital/social media) play in the production of everyday life, culture and belief

- employ digital storytelling, multi-platform, social and integrated communications techniques in the production of content

*Concentration in Integrated Marketing Communications*

Upon graduation from the Bachelor of Arts in Mass Communication program, students with an integrated marketing communications concentration should also be able to:

- demonstrate knowledge and practice of the latest theoretical and professional developments in the field of integrated marketing communications
- skillfully employ best practices in digital storytelling, multiplatform production, social engagement and integrated communication practices found in the field of integrated marketing communications

*Concentration in Journalism*

Upon graduation from the Bachelor of Arts in Mass Communication program, students with a concentration in journalism should also be able to:

- demonstrate knowledge and practice of the latest institutional, methodological and professional developments in the fields of print, web and broadcast journalism
- skillfully employ best practices found in the fields of print, broadcast and online journalism

## Admission to the Program

Admission to the program follows the university's undergraduate admission requirements.

AUS students transferring into the program must have achieved a minimum cumulative GPA of 2.00. Students who do not meet the minimum cumulative GPA requirement must consult with the department. If advised by the department to complete MCM 150, MCM 225 and MCM 231, students who successfully complete the three courses with a minimum average of 2.50 will be admitted into the program. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

To qualify for graduation with a Bachelor of Arts in Mass Communication, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 39 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 24 credit hours of MCM major requirements and major electives
  - a minimum of 30 credit hours of concentration requirements and concentration electives
  - five weeks or 240 hours of on-the-job training (MCM 497) with a professional firm
  - a minimum of 24 credit hours of free electives from non-MCM courses at the 100 level or above
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 39 credit hours)**

Students must successfully complete a minimum of 39 credit hours as follows:

- a minimum of 15 credit hours from non-MCM courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours taken from the natural sciences area
- mathematics requirement: MTH 100 or MTH 101 or MTH 103 or MTH 111
- statistics requirement: STA 202
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204, and ENG 208
- ethical understanding requirement: satisfied through MCM 321
- discipline-specific writing intensive course requirement: satisfied through MCM 231
- oral proficiency requirement: satisfied through ENG 208
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through MCM 101

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (18 credit hours)**

- MCM 101 Digital Video Skills I
- MCM 150 Introduction to Mass Communication Studies
- MCM 225 Theories of Mass Communication
- MCM 231 Writing for Mass Communication
- MCM 311 Mass Communication Research Methods and Data Analytics
- MCM 321 Mass Communication Law and Ethics
- MCM 497 Mass Communication Internship

*Mass Communication Internship (MCM 497)*

The internship comprises five weeks or 240 hours of on-the-job training with a professional firm. All students in the BAMC program must fulfill the internship requirement. Depending on their program concentration, students will choose to do their internship in news media, marketing communications or public relations agencies and departments to add practical training to their academic learning.

For details on internship eligibility and registration, please refer to Internship Registration in the Academic Policies and Regulations section earlier in this catalog.

**Major Electives**
**(minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours of accessible 300-level or above MCM courses not listed as major or concentration requirements. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Concentration in Integrated Marketing Communications (IMC)**
**(minimum of 30 credit hours)**

Students who select the IMC concentration must successfully complete a minimum of 30 credit hours as follows:

*Concentration Requirements*
*(24 credit hours)*

- MCM 222 Principles of Integrated Marketing Communications
- MCM 322 Case Studies in Integrated Marketing Communications
- MCM 323 Multiplatform Media Planning
- MCM 326 Content Creation for Integrated Marketing Communications
- MCM 424 Social Media Strategies
- MCM 485 Integrated Marketing Communications Campaigns
- MKT 201 Fundamentals of Marketing
- Students must successfully complete three credit hours in courses selected from the following list:
  - MKT 301 Consumer Behavior
  - MKT 302 Marketing Research
  - MKT 309 International Marketing
  - MKT 365 Service Marketing
  - MKT 370 Brand Management

*Concentration Electives*
*(minimum of 6 credit hours)*

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- MCM 309 Social Media for Mass Communication
- MCM 360 Crisis and Conflict Communication
- MCM 377 Photojournalism
- MCM 394/494 approved special topic courses in mass communication. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Arts in Mass Communication (BAMC)**
*Concentration: Integrated Marketing Communications*

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MCM 101 | Digital Video Skills I | 3 |
| | MTH 100 | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | MCM 150 | Introduction to Mass Communication Studies | 3 |
| | STA 202 | Introduction to Statistics for Social Sciences | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing About Literature or Advanced Academic Writing | 3 |
| | MCM 231 | Writing for Mass Communication | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ENG 208 | Public Speaking | 3 |
| | MCM 222 | Principles of Integrated Marketing Communications | 3 |
| | MCM 225 | Theories of Mass Communication | 3 |
| | MKT 201 | Fundamentals of Marketing | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MCM 311 | Mass Communication Research Methods and Data Analytics | 3 |
| | MCM 322 | Case Studies in Integrated Marketing Communications | 3 |
| | MCM 323 | Multiplatform Media Planning | 3 |
| | MJE | Major Elective | 3 |
| | | **Total** | **15** |
| Spring | MCM 321 | Mass Communication Law and Ethics | 3 |
| | MCM 326 | Content Creation for Integrated Marketing Communications | 3 |
| | CNE | Concentration Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | MCM 497 | Mass Communication Internship | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MCM 424 | Social Media Strategies | 3 |
| | CNR | Concentration Requirement – MKT course | 3 |
| | CNE | Concentration Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MCM 485 | Integrated Marketing Communications Campaigns | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

**Concentration in Journalism (minimum of 30 credit hours)**

Students who select the journalism concentration must successfully complete a minimum of 30 credit hours as follows:

*Concentration Requirements (24 credit hours)*

- MCM 275 Principles of Journalism
- MCM 310 Infographics for Journalism
- MCM 371 News Writing
- MCM 381 Digital Storytelling for Journalists
- MCM 474 Field News Reporting
- MCM 479 Multimedia Journalism
- Students must successfully complete two courses selected from the following list:
  - ARA 314 Media Arabic
  - HIS 208 Women in History
  - HIS 307 Modern Palestinian History
  - HIS 310 Modern Gulf History
  - POL 201 Introduction to Political Studies
  - POL 202 Introduction to International Relations
  - TRA 210 Introduction to Translation

*Concentration Electives (minimum of 6 credit hours)*

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- MCM 309 Social Media for Mass Communication
- MCM 374 Feature Writing
- MCM 376 Writing for Magazines
- MCM 377 Photojournalism
- MCM 378 Literary Journalism
- MCM 379 Journalism in the Arab Countries
- MCM 394/494 approved special topic courses in mass communication. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- MCM 480 Critical Analysis of the Mass Media

**Proposed Sequence of Study**
**Bachelor of Arts in Mass Communication (BAMC)**
*Concentration: Journalism*

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MCM 101 | Digital Video Skills I | 3 |
| | MTH 100 | Fundamentals of Logic and Geometry | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | MCM 150 | Introduction to Mass Communication Studies | 3 |
| | STA 202 | Introduction to Statistics for Social Sciences | |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Arts and Literature | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| **SECOND YEAR (30 credit hours)** | | | |
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing About Literature or Advanced Academic Writing | 3 |
| | MCM 231 | Writing for Mass Communication | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | | **Total** | **15** |
| Spring | ENG 208 | Public Speaking | 3 |
| | MCM 225 | Theories of Mass Communication | 3 |
| | MCM 275 | Principles of Journalism | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MCM 310 | Infographics for Journalism | 3 |
| | MCM 311 | Mass Communication Research Methods and Data Analytics | 3 |
| | MCM 321 | Mass Communication Law and Ethics | 3 |
| | MJE | Major Elective | 3 |
| | | **Total** | **15** |
| Spring | MCM 371 | News Writing | 3 |
| | MCM 381 | Digital Storytelling for Journalists | 3 |
| | CNE | Concentration Electives | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | MCM 497 | Mass Communication Internship | 0 |
| **FOURTH YEAR (30 credit hours)** | | | |
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MCM 474 | Field News Reporting | 3 |
| | CNE | Concentration Elective | 3 |
| | CNR | Concentration Requirement | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MCM 479 | Multimedia Journalism | 3 |
| | CNR | Concentration Requirement | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

### Minor in Integrated Marketing Communications

Students applying to the integrated marketing communications minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in integrated marketing communications must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

This minor is not open to mass communication students.

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- MCM 150 Introduction to Mass Communication Studies
- MCM 222 Principles of Integrated Marketing Communications
- MCM 231 Writing for Mass Communication

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in 300 level or above MCM courses selected from the integrated marketing communications concentration's required or elective courses.

### Minor in Journalism

Students applying to the journalism minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in journalism must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

This minor is not open to mass communication students.

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- MCM 150 Introduction to Mass Communication Studies
- MCM 231 Writing for Mass Communication
- MCM 275 Principles of Journalism

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in 300 level or above MCM courses selected from the journalism concentration's required or elective courses.

## Department of Mathematics and Statistics

Abdul Salam Jarrah, Head

**Faculty**

Zayid AbdulHadi
Taher Abualrub
Marwan Abukhaled
Ghada Alobaidi
Ziyad Al Sharawi
Ayman Alzaatreh
Mahmoud Anabtawi
Diana Audi
Ayman Badawi
Youssef Belhamadia
Stephen Chan
Cristian Enache
James Griffin
Gajath Gunatillake
Sadok Kallel
Suheil Khoury
Saadia Khouyibaba
Guillaume Leduc
Issam Louhichi
Mujo Mesanovic
Gergely Orosi
Shou-Hsing Shih
Hana Sulieman
Amjad Tuffaha
Faruk Uygul
Thomas Wunderli

The Department of Mathematics and Statistics seeks to develop, campus-wide, the level of mathematical skills and quantitative and logical reasoning required for individuals to make informed decisions and excel in their chosen disciplines. It also seeks to develop these same skills in the larger community. The department aims to provide students with the mathematical ability needed to fulfill future leadership roles. Innovative teaching and learning environments provide opportunities for students to develop critical thinking and general problem-solving strategies. The Department of Mathematics and Statistics specifically strives to ensure success in finding appropriate employment as well as success in graduate work for those desiring to further pursue their formal education.

The Department of Mathematics and Statistics also offers a Master of Science degree in Mathematics. For details, please refer to the *AUS Graduate Catalog*.

**Mission Statement**

The primary mission of the Department of Mathematics and Statistics is to educate students in the core competencies of mathematics and provide them with the necessary critical thinking skills. The department provides an education based on the American model, conducts research that is recognized internationally, and engages with the wider community through professional consultation, academic collaboration and other outreach activities.

### Bachelor of Science in Mathematics (BSMTH)

The mission of the Bachelor of Science in Mathematics program is to expose students to the theoretical foundations of mathematics, to provide them with understanding of the broad outlines of modern mathematics and its applications in a variety of disciplines, to stimulate their interest in research and to prepare them for their future work.

**Program Goals**

The Bachelor of Science in Mathematics program seeks to provide students with:

- a strong background in calculus-based courses, including advanced calculus and differential equations
- the skills needed to successfully produce mathematical proofs expected at the undergraduate level
- exposure to diverse areas of mathematics, such as analysis, algebra, applied mathematics, discrete mathematics, and probability and statistics

- an understanding of algorithmic foundation, modeling tools, discrete phenomena and digital information environments
- the ability to think critically and independently about problems to facilitate the development of an aptitude for mathematical reasoning
- the mathematical and computing skills necessary to describe and solve technical problems that arise in business and industry
- a solid foundation in mathematics necessary for future development and/or graduate study

**Program Outcomes**

Upon completion of the Bachelor of Science in Mathematics program, graduates should be able to:

- demonstrate knowledge and understanding of diverse areas in mathematics such as analysis, algebra, discrete mathematics and applied mathematics
- construct and effectively communicate valid mathematical arguments
- demonstrate a solid grounding in the ideas and techniques of mathematics
- apply mathematical analysis and mathematical skills to problems in other disciplines
- use discrete mathematical concepts in a variety of contexts such as algorithm development, computer programming and network development and implementation
- demonstrate the ability to identify and carry out thoughtful approaches to problem solving
- define and execute simple research tasks, and assist in more complex research tasks as required for professional work
- formulate a problem in mathematical terms from descriptions written in language specific to disciplines associated with engineering, finance and the natural sciences
- obtain the research skills necessary to adapt to change and remain current in the field and continue to learn new information, skills and concepts

## Admission to the Program

Admission to the program follows the university's undergraduate admission requirements.

AUS students transferring into the program must satisfy the following conditions:

- a minimum cumulative grade point average (CGPA) of 2.00
- a minimum grade of C (2.00) in each of MTH 104, MTH 205 and MTH 221

In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college Associate Dean for Undergraduate Affairs. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

To qualify for graduation with a Bachelor of Science in Mathematics, students must successfully complete the following minimum requirements:

- a minimum of 123 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 64 credit hours of major requirements and major electives
  - a minimum of 15 credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: any two courses from BIO 101, BIO 102, CHM 101, CHM 102, PHY 101 and PHY 101L, PHY 102 and PHY 102L
- mathematics requirement: MTH 103
- statistics requirement: STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses meeting this requirement, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through MTH 490
- discipline-specific writing intensive course requirement: satisfied through MTH 490
- oral proficiency requirement: satisfied through MTH 490
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through MTH 103

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (34 credit hours)**

- MTH 104 Calculus II
- MTH 203 Calculus III
- MTH 205 Differential Equations
- MTH 213 Discrete Mathematics
- MTH 221 Linear Algebra
- MTH 243 Introduction to Mathematical Programming
- MTH 311 Intermediate Analysis
- MTH 312 Advanced Calculus
- MTH 320 Abstract Algebra I
- MTH 343 Numerical Analysis I
- MTH 350 Introduction to Probability
- MTH 490 Senior Project

**Major Electives (minimum of 30 credit hours)**

Students must successfully complete a minimum of 30 credit hours as follows:

*Math Electives (minimum of 15 credit hours)*

After consulting with their academic advisors, students must successfully complete a minimum of 15 credit hours of major electives at the 300 level or above, with at least 6 at the 400 level, from any MTH/STA courses not listed as major requirements.

*Electives in Related Areas (maximum of 15 credit hours)*

With the approval of their advisors, students may complete a maximum of 15 credit hours in courses at the 200 level or above from courses in biology, chemistry, environmental sciences, physics, engineering and computer science, accounting, economics and finance.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. In meeting this requirement, the graduate-level courses must comply with the major electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours of free elective courses selected from courses at the 100 level or above, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Mathematics (BSMTH)**

| FIRST YEAR (32 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MTH 103 | Calculus I | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-SCI | Natural Sciences | 4 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Spring | MTH 104 | Calculus II | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-SCI | Natural Sciences | 4 |
| | | **Total** | **16** |

| SECOND YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing About Literature or Advanced Academic Writing | 3 |
| | MTH 203 | Calculus III | 3 |
| | MTH 213 | Discrete Mathematics | 3 |
| | MJE | Elective in Related Areas | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **15** |
| Spring | MTH 205 | Differential Equations | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | MTH 243 | Introduction to Mathematical Programming | 1 |
| | MJE | Math Elective | 3 |
| | GER-COM | Communication | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MTH 311 | Intermediate Analysis | 3 |
| | MTH 350 | Introduction to Probability | 3 |
| | MJE | Math Elective | 3 |
| | MJE | Elective in Related Areas | 3 |
| | | **Total** | **15** |
| Spring | MTH 320 | Abstract Algebra I | 3 |
| | MTH 343 | Numerical Analysis I | 3 |
| | MJE | Math Elective | 3 |
| | MJE | Elective in Related Areas | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MTH 312 | Advanced Calculus | 3 |
| | MJE | Math Elective | 3 |
| | MJE | Elective in Related Areas | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MTH 490 | Senior Project | 3 |
| | MJE | Elective in Related Areas | 3 |
| | MJE | Math Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Minor in Actuarial Mathematics

Students enrolling in the actuarial mathematics minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in actuarial mathematics must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 12 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

**Minor Requirements (12 credit hours)**

Students must successfully complete the following courses:

- MTH 102 Mathematics for Business II
  or
  MTH 103 Calculus I or
  MTH 111 Mathematics for Architects
- MTH 304 Mathematics of Finance
- MTH 305 Life Contingencies
- one of the following:

- STA 201 Introduction to Statistics for Engineering and Natural Sciences
- STA 202 Introduction to Statistics for Social Sciences
- QBA 201 Quantitative Business Analysis
- NGN 111 Introduction to Statistical Analysis, plus MTH 243 Introduction to Mathematical Programming or a one-credit directed study in actuarial mathematics

**Minor Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- MTH 307 Theory of Risk
- MTH 350 Introduction to Probability or MTH 360 Probability and Stochastic Processes or ELE 360 Probability and Stochastic Processes for Electrical Engineers or COE 375 Modeling and Simulation of Stochastic Systems
- MTH or STA 394/494 approved special topic courses in the areas of actuarial mathematics, probability and statistics. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- MTH or STA approved graduate-level courses (AMP students only). Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- ECO 351 Introduction to Econometrics or FIN 330 Investments or FIN 389 Advanced Financial Modeling or one 400-level course in FIN. AMP students may use an approved graduate-level FIN course towards meeting this requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Applied and Computational Mathematics

Students enrolling in the applied and computational mathematics minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in applied and computational mathematics must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 12 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

This minor is not open to students majoring in mathematics.

**Minor Requirements (12 credit hours)**

Students must successfully complete the following courses:

- MTH 205 Differential Equations
- MTH 221 Linear Algebra
- MTH 343 Numerical Analysis I or CVE 325 Numerical Methods in Engineering or MCE 325 Numerical Methods in Engineering
- MTH 351 Methods of Applied Mathematics

**Minor Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses meeting the following requirements:

- a minimum of three credit hours in approved 300-level or above MTH and/or STA courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- a maximum of three credit hours in courses from the following list:
  - ECO 451 Advanced Econometrics
  - ECO 452 Economic Forecasting
  - ELE 311 Electromagnetics
  - ELE 360 Probability and Stochastic Processes for Electrical Engineers or COE 375 Modeling and Simulation of Stochastic Systems
  - ELE 455 Digital Image Processing
  - ELE 456 Pattern Recognition
  - INE 323 Stochastic Processes and Simulation
  - INE 415 Design of Experiments
  - MCE 482 Intermediate Fluid Mechanics

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from approved graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. In meeting this requirement, the graduate-level courses must comply with the minor electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Data Science

Students enrolling in the data science minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in data science must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 12 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (12 credit hours)**

Students must successfully complete the following courses:

- CMP 120 Programming I or MIS 201 Fundamentals of Management Information Systems
- one of the following:
  - STA 201 Introduction to Statistics for Engineering and Natural Sciences
  - STA 202 Introduction to Statistics for Social Sciences
  - QBA 201 Quantitative Business Analysis
  - NGN 111 Introduction to Statistical Analysis, plus MTH 243 Introduction to Mathematical Programming or a one-credit CMP or COE directed study in data science
- STA 301 Foundations of Statistics for Data Science
- STA 401 Introduction to Data Mining or CMP 466 Machine Learning and Data Mining or MIS 388 Business Analytics

**Minor Electives**
**(minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses selected from the following list. A minimum of three credit hours must be successfully completed in courses at the 300-level or above.

- CMP 305 Data Structures and Algorithms
- CMP 320 Database Systems
- CMP 433 Artificial Intelligence
- COE 375 Modeling and Simulation of Stochastic Systems or ELE 360 Probability and Stochastic Processes for Electrical Engineers
- ECO 351 Introduction to Econometrics
- ECO 451 Advanced Econometrics
- ELE 456 Pattern Recognition
- FIN 430 Financial Forecasting
- INE 415 Design of Experiments
- MCM 311 Mass Communication Research Methods and Data Analytics
- MIS 301 Fundamentals of Database Management
- MTH 221 Linear Algebra
- MTH 350 Introduction to Probability
- MTH 382 Linear Programming and Optimization
- MTH or STA 394/494 approved special topic courses in the areas of probability, optimization and statistics
- STA 233 Introduction to Survey Sampling and Analysis
- UPL 302 Analysis of Spatial Phenomena

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from approved graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

# Department of Physics

Ali Alnaser, Head

**Faculty**

Shahin AbdulNabi
Randa Asa'd
Mehmet Egilmez
Sami El-Khatib
Nidhal Guessoum
Nasser Hamdan
Asad Hasan Jaidi
Tariq Majeed
Said Sakhi
Yousef Salamin
Isra Siry
Raza Syed

Besides preparing physics graduates with in-depth knowledge and unique skills, the Department of Physics aims to provide students of engineering and other applied sciences with a solid grounding in physics, which is essential for progress in their respective fields of study. The department also offers some courses on conceptual physics and astronomy as part of the natural sciences general education requirement.

## Bachelor of Science in Physics (BSPHY)

**Program Mission**

The Bachelor of Science in Physics seeks to provide graduates with a solid educational foundation in physics with an interdisciplinary emphasis that encompasses knowledge from other disciplines such as mathematics, natural sciences, engineering and the liberal arts. Graduates will be trained and prepared to pursue careers in industry, teaching and research.

**Program Goals**

The Bachelor of Science in Physics seeks to:

- provide students with up-to-date knowledge of physics principles and their applications
- prepare students for careers in industry, research and teaching, as well as for possible graduate study
- provide a research-based learning environment that is conducive to acquiring and analyzing data, developing experimental approaches to physics, and practicing the scientific research method
- provide opportunities for student undergraduate research projects under the guidance of the physics faculty
- maintain a dynamic curriculum that reflects the evolving needs of the region and the world
- foster the development of lifelong learners who think critically and solve problems creatively by integrating liberal studies, professional education, and co-curricular and extracurricular learning.

**Program Outcomes**

Upon graduation from the Bachelor of Science in Physics program, students will be able to:

- apply the basic laws of physics
- apply the theoretical and computing skills necessary to describe and solve problems that arise in physics
- design and conduct experiments, as well as analyze and interpret data using advanced analytical and characterization instrumentation techniques
- demonstrate competence in critical thinking and professional communication skills using both oral and written means for summarizing, evaluating and presenting scientific content using resources found in the scientific literature
- demonstrate understanding of the impact of physics principles in global, economic, environmental and societal contexts

### Admission to the Program

Admission to the program follows the university's undergraduate admission requirements.

AUS students transferring into the program must satisfy the following conditions:

- a minimum cumulative grade point average (CGPA) of 2.00
- successful completion of PHY 101 and PHY 102 with a minimum average of 2.00

For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

### Degree Requirements

To qualify for graduation with a Bachelor of Science in Physics, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 46 credit hours of major requirements
  - a minimum of 15 credit hours of major electives
  - a minimum of 15 credit hours of free electives
  - a minimum of five weeks of internship of approved applied work in physics-related organization, laboratory, agency or firm
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: PHY 101, PHY 101L, and CHM 101
- mathematics requirement: MTH 103
- statistics requirement: STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 203 or ENG 204
- ethical understanding requirement: satisfied through PHY 491
- discipline-specific writing intensive course requirement: satisfied through PHY 491
- oral proficiency requirement: satisfied through PHY 491
- information literacy requirement: satisfied through WRI 102, and ENG 203 or ENG 204
- computer literacy requirement: satisfied through MTH 103

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (46 credit hours)**

- MTH 104 Calculus II
- MTH 203 Calculus III
- MTH 205 Differential Equations
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II
- PHY 106 General Physics III
- PHY 113 Introduction to Astrophysics
- PHY 200L Intermediate Physics laboratory
- PHY 201 Modern Physics
- PHY 203 Introduction to Electronics
- PHY 310 Mathematical Methods in Physics
- PHY 320 Classical Mechanics
- PHY 330 Electromagnetic Theory or ELE 311 Electromagnetics
- PHY 350 Quantum Mechanics
- PHY 397 Internship in Physics
- PHY 400L Contemporary Experimental Physics
- PHY 460: Thermodynamics and Statistical Physics
- PHY 491 Senior Research Project I

**Major Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours of major electives selected in consultation with their advisor.

*Physics Electives (minimum of 9 credit hours)*

Students must successfully complete a minimum of nine credit hours in courses selected from the following list of physics electives:

- PHY 301 Energy Sources
- PHY 303 Atmospheric Physics
- PHY 305 Modern Optics and Lasers
- PHY 313 Satellites and Space Physics
- PHY 394/494 approved special topic courses in physics. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- PHY 492 Senior Research Project II

*Electives in Related Areas (maximum of 6 credit hours)*

Students must successfully complete a maximum of six credit hours in courses at the 300 level or above selected from courses in the following physics-related areas: CHE, CHM, CMP, CVE, ELE, ENV, MCE and MTH.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. In meeting this requirement, the graduate-level courses must comply with the major electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 15 credit hours)**

Students must successfully complete a minimum of 15 credit hours of free elective courses selected from courses at the 100 level or above, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Physics (BSPHY)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **14** |
| Spring | MTH 104 | Calculus II | 3 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | PHY 113 | Introduction to Astrophysics | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **16** |

| SECOND YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 203 or ENG 204 | Writing About Literature or Advanced Academic Writing | 3 |
| | MTH 205 | Differential Equations | 3 |
| | PHY 106 | General Physics III | 3 |
| | PHY 201 | Modern Physics | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **15** |
| Spring | MTH 203 | Calculus III | 1 |
| | PHY 200L | Intermediate Physics Laboratory | |
| | PHY 203 | Introduction to Electronics | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-COM | Communication | 3 |
| | | **Total** | **16** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | PHY 310 | Mathematical Methods in Physics | 3 |
| | PHY 320 | Classical Mechanics | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | PHY 330 or ELE 311 | Electromagnetic Theory or Electromagnetics | 3 |
| | PHY 350 | Quantum Mechanics | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | PHY 397 | Internship in Physics | 0 |

| FOURTH YEAR (29 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | PHY 400L | Contemporary Experimental Physics | 2 |
| | PHY 460 | Thermodynamics and Statistical Physics | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **14** |
| Spring | PHY 491 | Senior Research Project I | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Minor in Applied Physics

The minor in applied physics offers interested science and engineering students the opportunity to further their knowledge in the areas of space physics, physics of lasers, and semiconductors. Interested students must seek the approval of the head of the Department of Physics. Students enrolling in the applied physics minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in applied physics must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements**
**(9 credit hours)**

Students must successfully complete the following courses:

- PHY 101 General Physics I or PHY 102 General Physics II
- PHY 106 General Physics III or PHY 113 Introduction to Astrophysics
- PHY 201 Modern Physics

**Minor Electives**
**(minimum of 9 credit hours)**

Students must successfully complete a total of nine credit hours of electives as follows:

*Physics Elective Courses*
*(a minimum of 3 credit hours)*

- PHY 301 Energy Sources
- PHY 303 Atmospheric Physics
- PHY 305 Modern Optics and Lasers
- PHY 310 Mathematical Models in Physics
- PHY 313 Satellites and Space Physics
- PHY 320 Classical Mechanics
- PHY 330 Electromagnetic Theory
- PHY 350 Quantum Mechanics
- any approved 300-level or above PHY courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

*Physics-Related Elective Courses*
*(a maximum of 6 credit hours)*

- CHM 330 Physical Chemistry I
- CHM 332 Physical Chemistry III
- ELE 311 Electromagnetics
- MCE 311 Engineering Measurements
- MCE 344 Heat Transfer

# Performing Arts Program

Anthony Tassa, Coordinator

**Faculty**

Albert Agha

Isabela Marchi Tavares Di Melo

James Gross

Sherri Weiler

**Program Mission**

The mission of the Performing Arts Program is to examine and promote music and theatre by providing students with opportunities to explore how the performing arts foster creativity and promote inclusiveness, diversity and understanding in an increasingly interdependent world. Through their course of study, students learn to think critically, engage creatively and collaborate effectively. Performing arts skills are life skills, leading to enhanced life options and diversified employability.

**Program Goals**

The Performing Arts Program seeks to provide students with:

- knowledge of various genres and perspectives of music and music theory
- the ability to distinguish the construction of music
- musicianship skills that can be applied to individual and ensemble performances
- an appreciation for the art and craft of theatre through production and presentation
- a thorough understanding of theatrical elements gained through performance and theoretical studies

## Minor in Music

The minor in music aspires to promote an understanding of the role of music in relation to its cultural and social context. Music courses provide students with essential training in the performing arts and contribute to enhancing the program of liberal studies that forms the core of an AUS education.

Students seeking a minor in music must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

All course prerequisites must be satisfied. Auditions are required for performance courses.

**Minor Requirements (9 credit hours)**

Students must successfully complete nine credit hours as follows:

- MUS 100 Elements of Music or MUS 101 Class Voice and Music Notation or MUS 102 Oud and Buzuk Class or MUS 170 Class Piano I
- MUS 200 Introduction to European Classical Music or MUS 202 Survey of World Music or MUS 203 Introduction to Arabic, Turkish and Persian Classical Music or MUS 270 Class Piano and History
- any combination of the following courses for a total of three credit hours:
  - MUS 252 Applied Lessons (repeatable up to three times)
  - MUS 255 Music Ensemble (repeatable up to three times)

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours as follows:

- a minimum of three credit hours from any 300-level or above MUS course not used as minor requirements
- a maximum of six credit hours from any approved 300-level or above interdisciplinary studies (IDS) or THE courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Theatre

The minor in theatre aspires to promote an understanding of the role of theatre in relation to its cultural, social and political context. Theatre courses provide students with essential training in the performing arts and related disciplines, and contribute to enhancing the program of liberal studies that forms the core of an AUS education.

Students seeking a minor in theatre must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

All course prerequisites must be satisfied. Auditions are required for rehearsal and performance courses.

**Minor Requirements (9 credit hours)**

Students must successfully complete nine credit hours from the following:

- THE 101 Theatre Appreciation or THE 102 Dramatic Process or THE 141 Stagecraft
- THE 230 Dramatic Literature or THE 242 Elements of Theatrical Design or THE 246 Costume Design or THE 253 Musical Theatre Production or THE 255 Voice and Movement I
- any combination of the following courses for a total of three credit hours:
  - THE 245 Technical Theatre Lab (repeatable up to three times)
  - THE 251 Rehearsal and Performance (repeatable up to three times)

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours from the following, with a minimum of three credit hours from 300-level or above THE courses:

- any 300-level or above THE courses not used as minor requirements
- ENG 303 Shakespeare's Plays
- ENG 316 Modern Drama and Beyond
- ENG 393 Shakespeare on Film
- any approved 300-level or above MUS courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

# Other Minors Offered by the College of Arts and Sciences

## Minor in Middle Eastern Studies

Imed Ben Jemaa Nsiri, Coordinator

The minor in Middle Eastern studies enables students to design their own course of study in an area of Middle Eastern studies that spans the Arab nations and Islamic civilization. The minor requires students to satisfy the Arabic heritage requirement and complete a course in Arabic language. Along with this, students, in consultation with the minor advisor, design their course of study from a host of courses across the university's undergraduate catalog.

Students seeking a minor in Middle Eastern studies must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credits hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements**
**(6 credit hours)**

*Arabic Language Requirement*
*(3 credit hours)*

Students must successfully complete one course as follows:

- for native and near-native speakers of Arabic
  - ARA 308 Arabic Grammar in Use
  - ARA 309 Business Arabic
  - ARA 314 Media Arabic
  - ARA 404 Working with MSA Texts
- for non-native speakers of Arabic
  - ARA 106 Elementary Arabic II
  - ARA 203 Intermediate Arabic I
  - ARA 204 Intermediate Arabic II
  - ARA 220 Composition for Non-Native Speakers of Arabic

*Arabic Heritage Requirement*
*(3 credit hours)*

Students must successfully complete one course from the following list:

- ARA 101 Introduction to Arabic Heritage I
- ARA 102 Introduction to Arabic Heritage II
- ARA 103 Arabic Music in a Historical Context

**Minor Electives**
**(minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours from at least two of the following tracks. No more than six credit hours can be taken in any single track and at least nine of the 12 credit hours must be at the 300 level or above.

*Islamic Architecture and Urbanism Track*

- ARC 225 Islamic Art and Architecture
- ARC 424 Evolution of Cities
- ARC 474 Issues in Contemporary Urban Design
- IDE 225 History and Theory of Interior Design: Global and Regional Issues
- any approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

*Arabic Studies Track*

Arabic Language

- ARA 340 The Social Context of Arabic
- any approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

Arabic Literature

- ARA 201 Arabic Literature in Translation
- ARA 206 Modern Arabic Prose
- ARA 304 Modern Arabic Poetry
- ARA 403 War and Peace in Arabic Literature and Film
- any approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

Arab/Islamic Culture and Civilization

- ARA 240 Arab-Islamic Culture and Civilization
- ARA 280 Introduction to Hadith
- ARA 281 The Art of Qur'anic Recitation (Tajweed)
- ARA 302 Arab Identity and Thought
- ARA 303 Classical Arab/Islamic Culture
- ARA 306 Arabic Travel Writings
- ARA 307 Arabs and the "Other"
- ARA 380 Sufism: Readings in Islamic Mysticism
- ARA 383 Islamic Law and Jurisprudence
- ARA 385 Islamic Texts in Translation
- ARA 402 Qur'anic Studies
- PHI 310 Islamic Political Philosophy
- any approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

*History, Economics and Politics of the Middle East Track*

- ECO 315 Economics of the Middle East
- HIS 204 Modern Arab History
- HIS 307 Modern Palestinian History
- HIS 308 Ottoman History
- HIS 310 Modern Gulf History
- HIS 311 America and the Middle East
- HIS 312 Modern Iranian History
- INS 413 Political Economy of the Arab World
- INS 415 War and Peace in the Middle East
- PHI 202 Introduction to Islamic Philosophy
- POL 409 Politics and Civil Society in the Middle East
- any approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

*Islamic Finance and Economics Track*

- ECO 315 Economics of the Middle East
- FIN 370 Fundamental of Islamic Finance
- any approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

# College of Engineering

**Dean**
Sirin Tekinay

**Associate Dean for Undergraduate Affairs**
Assim Sagahyroon

**Associate Dean for Graduate Affairs and Research**
Lotfi Romdhane

The College of Engineering (CEN) offers bachelor of science (BS) degrees in several engineering disciplines and in computer science. These are all comprehensive curricula that emphasize quality, communication skills, application to real-world situations, interdisciplinary learning and team building. AUS College of Engineering graduates are well equipped to face the future. A degree from the AUS College of Engineering gives its holder access to a learned profession with opportunities for practice in industry, government, business, consulting and entrepreneurship. AUS engineering graduates are also well qualified for advanced studies toward a master's or doctoral degree leading to careers in research and development, engineering management and higher education teaching. Additionally, an engineering education is an excellent avenue to other professions such as law, medicine and public service.

## ABET Accreditation

The bachelor of science degrees offered by the College of Engineering are accredited by ABET (http://www.abet.org). ABET is the recognized accreditor for college and university programs in applied science, computing, engineering and technology in the United States. ABET is a federation of 36 professional and technical societies representing these fields. ABET currently accredits approximately 4,500 programs at more than 793 colleges and universities in 32 countries worldwide and is recognized by the Council for Higher Education Accreditation in Washington, DC.

ABET accreditation demonstrates the university's continuing commitment to the quality of its programs so that CEN students are ready to practice once they graduate and employers can count on AUS graduates to meet their needs.

## Mission Statement

American University of Sharjah is a dynamic institution of higher education. As such, it offers its students an innovative educational environment. The university's degree programs are adapted to the needs of the citizenry of the United Arab Emirates and the Gulf Cooperation Council (GCC). In order to fulfill current and projected needs while maintaining an American-style curriculum, the College of Engineering has the following mission:

The College of Engineering at American University of Sharjah aspires to be the recognized leader in engineering education in Sharjah, across the UAE and the GCC, and to become a top choice by students, parents, faculty and staff who choose to contribute to engineering higher education.

The college's degree programs offer the highest level of professional and technical preparation, global preparedness and leadership development in an environment of English-language instruction and partnership between faculty and students. All programs offer state-of-the art technology, understanding and experimentation with design and problem-solving processes, and excellent opportunities to experience real-world and research project involvement.

## Objectives and Outcomes

In order to help students be successful at AUS, the major educational objectives of the College of Engineering are to:

- assist students in achieving their potential through preparation for a successful and satisfying career in the engineering and computer science professions
- prepare well-educated graduates able to serve in regional and international practice with consideration of multicultural environments
- prepare a bachelor of science-level graduate to be successful in graduate studies in a related area
- offer undergraduate and graduate academic programs that are critical to the sustainable development of society and the quality of life in the region
- offer broad-based curricula worthy of accreditation nationally and internationally due to a thorough, balanced foundation in math, science and design principles, as well as the humanities and social sciences

The graduates of the College of Engineering are educated to be able to demonstrate the following outcomes:

- approach the system stages of problem identification, needs analysis, requirements definition, design, implementation, maintenance and phase-out using the lifecycle concept
- write, read and speak in private and public to peers, supervisors and employers in a coherent, organized fashion that demonstrates understanding of problems and solutions that are practical and implementable
- utilize in a variety of settings the fundamentals of math, science and engineering principles
- keep abreast of and utilize in their work current computer and software technologies that are relevant to the graduates' chosen fields
- achieve a recognized level of engineering practice and certification available to an engineering graduate serving in professional practice
- participate in, as well as lead, team-based activities using current technology, engineering practices and science principles
- make and implement ethical choices in all professional endeavors

## Curriculum

The curriculum for each of the college's degree programs has its own distinguishable features; however, common threads of design and problem solving have been woven into the fabric of the curricula to ensure that each student receives the very best education tailored to the needs of the Middle Eastern student and industry. With the exception of the industrial engineering students, all first-year students pursuing an engineering degree take the same courses to ensure a sound, broadly based preparation in general education knowledge as well as a firm understanding of the principles and practices of all engineering disciplines. The first year for industrial engineering and computer science is slightly different.

The engineering and computer science programs are intended to prepare graduates for regional as well as worldwide practice. The programs are designed to satisfy the general university requirements and to meet the program criteria adopted by accreditation agencies both in the United Arab Emirates and in the United States. The degree programs emphasize learning, creativity, collaboration and innovation, as well as instill in their graduates leadership qualities anchored in moral and ethical

principles. The college's faculty members provide an educational experience that is equivalent to those offered by leading state and private universities in the United States and Europe.

College of Engineering graduates will work in an international and very competitive environment. Graduates must possess English fluency in both written and spoken forms; hence, instruction and interaction between students and faculty members are conducted in English. English fluency is especially critical as more multinational corporations adopt English as the corporate language.

In various formats, the oral, written, graphical and software communication skills of a student are developed, demonstrated and assessed. This is accomplished foremost in the required laboratories, research papers, senior projects and professional training. Also, independent study one-on-one with faculty members is a valuable option available to the student. The critical use of paper and electronic forms of published literature is taught from the first semester in all curricula in the College of Engineering. Throughout the degree plan, students must use and are assessed on their ability to discover, understand and critically judge the quality of publicly available literature.

Well-equipped computer laboratories are provided for students during and after classes and laboratories. The menu of software systems available for design, analysis and synthesis tasks in classes, laboratories, senior projects and courses in other parts of campus is determined by what the faculty members teach in all of their courses. Each student must complete a team-based extensive senior project focused on a real-world problem that requires specification, design, analysis and synthesis as the problem-solving process is utilized. Faculty members serve as close advisors and monitor each student's progress. Additionally, each student must complete a summer professional training program in order to graduate. Many employers participate in this valuable experience.

**Assessment and Evaluation of Curriculum**

The College of Engineering has developed and implemented the Course Assessment and Improvement Process (CAIP). It is a comprehensive approach to the collection of student and faculty assessments of course material, delivery and student perception of learning. The results are used to improve course and laboratory content, delivery methods, testing and practical applications at the course level, for technical and supporting areas, as well as at the degree levels. The result is an ongoing process whereby students can be assured of improvements on a continuing basis.

**Admission to Second Year**

*Engineering Programs*

Except for the Bachelor of Science in Industrial Engineering (BSIE) program, the first year—which provides a base in physics, chemistry, engineering and mathematics—is common to all students in the engineering degree programs. Students with acceptable grades can change majors within the engineering programs with almost no credit hours loss during the first year.

Formal admission to a major at the second-year level in engineering programs requires meeting the following conditions:

- a cumulative grade point average (CGPA) of 2.00
- a minimum grade of C- (1.70) in each of the following courses: NGN 110 Introduction to Engineering and Computing and WRI 101 Academic Writing I
- the following additional requirements:

  Computer Engineering Program

  - a minimum grade point average of C (2.00) and a minimum grade of C- (1.70) in at least 11 credit hours from the following list of required first-year-level science and mathematics courses: MTH 103, MTH 104, PHY 101, PHY 101L, PHY 102, PHY 102L and NGN 111
  - a minimum grade of C (2.00) in CMP 120

  Industrial Engineering Program

  - a minimum grade point average of C (2.00) and a minimum grade of C- (1.70) in at least 15 credit hours from the following list of required first-year-level science and mathematics courses: MTH 103, MTH 104, PHY 101, PHY 101L, PHY 102, PHY 102L, CHM 101 and STA 201.

  All Other Engineering Programs

  - a minimum grade point average of C (2.00) and a minimum grade of C- (1.70) in at least 15 credit hours from the following list of required first-year-level science and mathematics courses: MTH 103, MTH 104, PHY 101, PHY 101L, PHY 102, PHY 102L, CHM 101 and NGN 111.

*Computer Science Program*

Formal admission to the second-year level in computer science requires meeting the following conditions:

- a cumulative grade point average (CGPA) of 2.00
- a minimum grade of C- (1.70) in each of the following courses: NGN 110 Introduction to Engineering and Computing and WRI 101 Academic Writing I
- a minimum grade of C (2.00) in CMP 120
- a minimum grade point average of C (2.00) and a minimum grade of C- (1.70) in MTH 103 or MTH 104 and in one four-credit-hour science course from the following list: BIO 101, BIO 102, CHM 101 and CHM 102. Students could also complete PHY 101 and PHY 101L or PHY 102 and PHY 102L to meet this requirement.

**Graduation Requirements**

*Engineering Programs*

Each engineering program is designed for completion in four years, including two summer terms of study (six weeks each) and a summer professional training. Students whose academic backgrounds require the completion of preparatory courses in mathematics, English or physics will require more than four years to complete the engineering program. Even without preparatory courses, many students opt to take additional time to complete their program.

During the final year, a senior design (capstone) project must be completed over a two-course sequence.

Practical training in an engineering environment strengthens the student's preparation for engineering practice; therefore, all students must complete a minimum of five weeks' professional training. Students are also offered the opportunity to complete a 10-week internship that will also meet their program internship graduation requirement.

To qualify for graduation from an engineering program, students must successfully complete the following minimum requirement:

- a minimum of 140 credit hours, as follows:
  - a minimum of 41 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 90 credit hours in major requirements and major electives, which include courses in mathematics, sciences, engineering sciences and engineering design that ensure preparation for professional practice
  - a minimum of six credit hours of free electives
  - a professional training working in a professional environment for at least five weeks after the third year
- a minimum cumulative GPA of 2.00

*Computer Science Program*

The computer science program is designed for completion in four years, including a summer professional training. Students whose academic backgrounds require the completion of preparatory courses in mathematics, English or physics will require more than four years to complete the program.

During the final year, a senior design (capstone) project must be completed over a two-course sequence. Practical training in a computer science professional environment strengthens the student's preparation for professional practice.

To qualify for graduation with the Bachelor of Science in Computer Science, students must successfully complete the following minimum requirements:

- a minimum of 130 credit hours, as follows:
  - a minimum of 45 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - a minimum of 73 credit hours of major requirements and major electives
  - a minimum of nine credit hours of free electives
  - a professional training working in a professional environment for at least five weeks after the third year
- a cumulative GPA of 2.00 or better

## Degree Programs

The College of Engineering offers the following undergraduate degree programs:

- Bachelor of Science in Chemical Engineering
- Bachelor of Science in Civil Engineering
- Bachelor of Science in Computer Engineering
- Bachelor of Science in Computer Science
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Industrial Engineering
- Bachelor of Science in Mechanical Engineering

The College of Engineering also offers master's and PhD degree programs. For details on the College of Engineering graduate programs, please refer to the *AUS Graduate Catalog*.

## Minor Offerings

The College of Engineering offers the following minors:

- aerospace engineering
- biomedical engineering
- computer engineering
- computer science
- electrical engineering
- engineering management
- environmental and water engineering
- mechanical engineering
- mechatronics engineering
- renewable energy
- transportation systems

Details on each minor are provided later in this section.

## Special Notes

In order to make full use of the learning environment, in-class collaboration, and work in groups on multidisciplinary projects, all entering CEN students are required to purchase laptop computers specified by the university.

# Department of Chemical Engineering

Sameer Al-Asheh, Interim Head

**Faculty**

Nabil Abdel-Jabbar
Amani Al-Othman
Rachid Chebbi
Naif Darwish
Ghaleb Husseini
Taleb Ibrahim
Yassir Makkawi
Paul Nancarrow
Rana Sabouni
Zarook Shareefdeen
Karnail Singh

## Bachelor of Science in Chemical Engineering (BSChE)

The Bachelor of Science in Chemical Engineering program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Engineering Accreditation Commission of ABET, http://www.abet.org.

Chemical engineers have many different responsibilities including design, analysis, research and development, supervision, production and sales. They manage the development of new technologies and products; they develop safe and environmentally benign processes that are efficient and economical to operate; and they direct the design, construction and operation of new plants, ranging from pilot plants to full-scale chemical facilities.

Chemical engineers are making unparalleled contributions in chemical and petrochemical processing, oil and gas facilities, water and energy sectors, food and pharmaceutical industries, pollution control and abatement, process automation, process control and modeling, and biochemical technology. The Department of Chemical Engineering offers a four-year program of study that prepares graduates to work in all areas of the chemical industry. Specifically, it is designed to help students in developing a basic knowledge in science, in engineering and in the fundamentals and practical knowledge of thermodynamics, fluid flow, heat transfer, mass transfer, reaction engineering, unit operation, process control, process simulation, plant design, process integration, cost estimation, pollution prevention and waste management.

**Mission Statement**

The mission of the chemical engineering program at AUS is to prepare students for a technical career, to be innovative and ethically responsible, and to provide leadership in chemical engineering and related disciplines.

**Program Educational Objectives**

The objectives of the chemical engineering program are to produce graduates who will:

- succeed in the chemical engineering profession through technical competence, effective communication, teamwork and leadership
- maintain a lifelong interest in learning for personal and professional development
- practice engineering in a manner that is ethically responsible and consistent with regulatory and social concerns

**Student Outcomes**

Upon graduation, an AUS graduate in chemical engineering should demonstrate:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering

solutions in global, economic, environmental and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the engineering programs' second year admission requirements. For details, refer to Admission to Second Year/Engineering Programs earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more information, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

Students seeking the BSChE degree must successfully complete the following minimum requirements:

- a minimum of 140 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 81 credit hours of major requirements, including a professional training for at least five weeks after the third year.
  - a minimum of nine credit hours of major electives
  - a minimum of six credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For more information, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103 and MTH 104
- statistics requirement: satisfied through NGN 111
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through CHE 432
- discipline specific writing intensive course requirement: satisfied through CHE 206
- oral proficiency requirement: satisfied through CHE 491
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through CHE 240

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (81 credit hours)**

- CHE 205 Principles of Chemical Engineering I
- CHE 206 Principles of Chemical Engineering II
- CHE 214 Chemical Engineering Thermodynamics I
- CHE 230 Materials Science
- CHE 240 Computer Methods in Chemical Engineering
- CHE 300 Fluid Mechanics
- CHE 304 Chemical Engineering Thermodynamics II
- CHE 307 Heat Transfer
- CHE 321 Chemical Reaction Engineering
- CHE 329 Mass Transfer
- CHE 332 Engineering Economy
- CHE 350 Chemical Engineering Laboratory I
- CHE 397 Professional Training in Chemical Engineering (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- CHE 412 Separation Processes
- CHE 421 Chemical Process Dynamics and Control
- CHE 432 Process Design Safety and Economics
- CHE 433 Chemical Process Safety
- CHE 451 Chemical Engineering Laboratory II
- CHE 452 Process Dynamics and Control Laboratory
- CHE 490 Senior Design Project I
- CHE 491 Senior Design Project II
- CHM 102 General Chemistry II
- CHM 215 Organic Chemistry I
- CHM 217 Organic Chemistry Laboratory I
- CHM 331 Physical Chemistry II
- ELE 225 Electric Circuits and Devices
- MTH 203 Calculus III
- MTH 205 Differential Equations
- MTH 221 Linear Algebra
- NGN 110 Introduction to Engineering and Computing
- NGN 111 Introduction to Statistical Analysis
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II

**Major Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list,

with a minimum of six credit hours in CHE courses:

- BME 420 Biomedical Electronics I
- BME 422 Biomedical Imaging
- CHE 434 Petroleum Refining Processes
- CHE 436 Natural Gas Processing
- CHE 443 Design and Analysis of Experiments
- CHE 461 Air Pollution
- CHE 467 Corrosion
- CHE 470 Waste Management and Control in Chemical Engineering
- CHE 472 Water and Wastewater Treatment Design
- CHE 481 Fundamentals of Biomedical Engineering
- CHE 494 special topic courses in chemical engineering
- CHM 332 Physical Chemistry III
- CHM 345 Instrumental Analysis
- CHM 431 Biophysical Chemistry
- EGM 361 Management for Engineers
- EGM 362 Engineering Project Management

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses at or above the 100 level, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Chemical Engineering (BSChE)**

| FIRST YEAR (37 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **16** |
| Spring | MTH 104 | Calculus II | 3 |
| | NGN 111 | Introduction to Statistical Analysis | 2 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | MTH 205 | Differential Equations | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **6** |

| SECOND YEAR (39 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHE 205 | Principles of Chemical Engineering I | 2 |
| | CHM 102 | General Chemistry II | 4 |
| | ELE 225 | Electric Circuits and Devices | 3 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | MTH 203 | Calculus III | 3 |
| | | **Total** | **15** |
| Spring | CHE 206 | Principles of Chemical Engineering II | 3 |
| | CHE 214 | Chemical Engineering Thermodynamics I | 3 |
| | CHE 230 | Materials Science | 3 |
| | CHE 240 | Computer Methods in Chemical Engineering | 3 |
| | CHM 215 | Organic Chemistry I | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | | **Total** | **18** |
| Summer | ENG 207 | Professional Communication for Engineers | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **6** |

| THIRD YEAR (32 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHE 300 | Fluid Mechanics | 3 |
| | CHE 304 | Chemical Engineering Thermodynamics II | 3 |
| | CHE 307 | Heat Transfer | 3 |
| | CHM 217 | Organic Chemistry Laboratory I | 1 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **16** |
| Spring | CHE 321 | Chemical Reaction Engineering | 3 |
| | CHE 329 | Mass Transfer | 3 |
| | CHE 332 | Engineering Economy | 3 |
| | CHE 350 | Chemical Engineering Laboratory I | 1 |
| | CHM 331 | Physical Chemistry II | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | | **Total** | **16** |
| Summer | CHE 397 | Professional Training in Chemical Engineering | 0 |

| FOURTH YEAR (32 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHE 412 | Separation Processes | 3 |
| | CHE 421 | Chemical Process Dynamics and Control | 3 |
| | CHE 432 | Process Design, Safety and Economics | 3 |
| | CHE 451 | Chemical Engineering Laboratory II | 1 |
| | CHE 490 | Senior Design Project I | 1 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **17** |
| Spring | CHE 433 | Chemical Process Safety | 3 |
| | CHE 452 | Process Dynamics and Control Laboratory | 1 |
| | CHE 491 | Senior Design Project II | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

# Department of Civil Engineering

Irtishad Ahmad, Head

**Faculty**

Jamal Abdalla
Akmal Abdelfatah
Farid Abed
Ghassan Abu-Lebdeh
Mohamed AlHamaydeh
Tarig Ali
Adil Al-Tamimi
Mohammed Taher Aqeel
Serter Atabay
Mousa Attom
Salwa Beheiry
Magdi El-Emam
Sameh El-Sayegh
Kazi Parvez Fattah
Rami Hawileh
Zahid Khan
Maruf Mortula
Sami Tabsh
Sherif Yehia

## Bachelor of Science in Civil Engineering (BSCE)

The Bachelor of Science in Civil Engineering program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Engineering Accreditation Commission of ABET, http://www.abet.org.

The civil engineering program provides the necessary technical skills in mathematics, basic sciences, engineering sciences, engineering design, humanities and social sciences consistent with accreditation standards and national needs. The program provides critical learning for a broad foundation in structures, environmental engineering, geotechnical, materials, water resources, urban planning and transportation. Considerable emphasis is placed on group-based, open-ended design projects to provide students with the necessary skills for creative teamwork and to prepare them professionally for diverse employment opportunities. Preparation for professional practice and graduate studies is accomplished through careful selection of professional and technical electives. Students are motivated to keep abreast of current technical developments, to improve communication skills, to use computer tools, to be aware of project constraints, and to develop and maintain high standards of ethics and professionalism. The civil engineering program provides an environment conducive to learning that stimulates both students and faculty.

**Mission Statement**

The mission of the civil engineering program at AUS is to provide students with the highest level of technical preparation, social responsibility, leadership and lifelong learning skills for successful careers in civil engineering. The department offers quality education based on a nationally and internationally recognized curriculum supported by well-equipped laboratories and state-of-the-art educational tools. The department provides a professional environment that fosters fairness, ethics, diversity, faculty development, quality research, and outreach with industry and public agencies.

**Program Educational Objectives**

The objectives of the civil engineering program are to produce graduates who will:

- have successful careers in civil engineering and become independent thinkers, effective communicators, team members, decision makers and leaders in industry and public sectors
- understand the global, ethical and social implications of the civil engineering profession and promote public safety and environmental protection
- pursue advanced studies successfully and engage in continuing education and lifelong learning

**Student Outcomes**

Upon graduation, an AUS graduate in civil engineering should demonstrate:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

### Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the engineering programs' second year admission requirements. For details, refer to Admission to Second Year/Engineering Programs earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

### Degree Requirements

Students seeking the BSCE degree must successfully complete the following minimum requirements:

- a minimum of 140 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 84 credit hours of major requirements, including a professional training for at least five weeks after the third year
  - a minimum of six credit hours of major electives
  - a minimum of six credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103 and MTH 104
- statistics requirement: satisfied through NGN 111
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through CVE 490
- discipline specific writing intensive course requirement: satisfied through CVE 491
- oral proficiency requirement: satisfied through CVE 491
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through CVE 211

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (84 credit hours)**

- CVE 202 Construction Materials Laboratory
- CVE 211 Fundamentals of Graphics and Programming
- CVE 220 Statics
- CVE 223 Mechanics of Materials
- CVE 224 Construction Materials and Quality Control
- CVE 231 Geology
- CVE 240 Fluid Mechanics
- CVE 241 Elementary Surveying
- CVE 242 Field Plane Surveying
- CVE 263 Urban Transportation Planning
- CVE 267 Civil Engineering Cost Analysis
- CVE 301 Theory of Structures
- CVE 303 Geotechnical Engineering Laboratory
- CVE 304 Environmental and Water Engineering Laboratory
- CVE 310 Fundamentals of Structural Dynamics
- CVE 312 Structural Steel Design
- CVE 313 Reinforced Concrete Design
- CVE 325 Numerical Methods in Engineering
- CVE 331 Geotechnical Engineering Principles
- CVE 333 Geotechnical Engineering Design
- CVE 341 Water Resources Engineering
- CVE 351 Environmental Engineering
- CVE 363 Highway Design
- CVE 367 Project Estimating, Planning and Control
- CVE 397 Professional Training in Civil Engineering (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- CVE 490 Civil Engineering Design Project I
- CVE 491 Civil Engineering Design Project II
- MTH 203 Calculus III
- MTH 205 Differential Equations
- MTH 221 Linear Algebra
- NGN 110 Introduction to Engineering and Computing
- NGN 111 Introduction to Statistical Analysis
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II

**Major Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- CVE 410 Computer Methods in Structural Analysis
- CVE 411 Structural Concrete Design
- CVE 414 Prestressed Concrete Design
- CVE 431 Fundamentals of Earthquake Engineering
- CVE 437 Advanced Concrete Technology
- CVE 441 Coastal Engineering
- CVE 442 Advanced Foundation Engineering
- CVE 446 Geotechnical Dam Engineering
- CVE 451 Urban Water Infrastructure Management
- CVE 452 Water Supply and Sewerage Engineering
- CVE 456 Traffic Engineering
- CVE 457 Airport Planning and Design
- CVE 463 Construction Management
- CVE 467 Building Construction Materials and Methods
- CVE 472 Geographic Information Systems
- CVE 494 special topic courses in civil engineering

AMP students may use approved graduate-level courses, successfully complete while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 6 credit hours)**

Student must successfully complete a minimum of six credit hours in courses at or above the 100 level, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Civil Engineering (BSCE)**

| FIRST YEAR (37 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **16** |
| Spring | MTH 104 | Calculus II | 3 |
| | NGN 111 | Introduction to Statistical Analysis | 2 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | WRI 102 | Academic Writing II | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | MTH 205 | Differential Equations | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **6** |

| SECOND YEAR (37 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CVE 211 | Fundamentals of Graphics and Computer Programming | 3 |
| | CVE 220 | Statics | 3 |
| | CVE 231 | Geology | 3 |
| | CVE 241 | Elementary Surveying | 3 |
| | CVE 242 | Field Plane Surveying | 1 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | | **Total** | **16** |
| Spring | CVE 223 | Mechanics of Materials | 3 |
| | CVE 240 | Fluid Mechanics | 3 |
| | CVE 263 | Urban Transportation Planning | 3 |
| | CVE 267 | Civil Engineering Cost Analysis | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | | **Total** | **15** |
| Summer | CVE 341 | Water Resources Engineering | 3 |
| | ENG 207 | Professional Communication for Engineers | 3 |
| | | **Total** | **6** |

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CVE 202 | Construction Materials Laboratory | 1 |
| | CVE 224 | Construction Materials and Quality Control | 3 |
| | CVE 301 | Theory of Structures | 3 |
| | CVE 303 | Geotechnical Engineering Laboratory | 1 |
| | CVE 331 | Geotechnical Engineering Principles | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MTH 203 | Calculus III | 3 |
| | | **Total** | **17** |
| Spring | CVE 304 | Environmental and Water Engineering Laboratory | 1 |
| | CVE 312 | Structural Steel Design | 3 |
| | CVE 313 | Reinforced Concrete Design | 3 |
| | CVE 325 | Numerical Methods in Engineering | 3 |
| | CVE 351 | Environmental Engineering | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **16** |
| Summer | CVE 397 | Professional Training in Civil Engineering | 0 |

| FOURTH YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CVE 333 | Geotechnical Engineering Design | 3 |
| | CVE 363 | Highway Design | 3 |
| | CVE 367 | Project Estimating, Planning and Control | 3 |
| | CVE 490 | Civil Engineering Design Project I | 1 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Spring | CVE 310 | Fundamentals of Structural Dynamics | 3 |
| | CVE 491 | Civil Engineering Design Project II | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | | **Total** | **17** |

## Department of Computer Science and Engineering

Fadi Aloul, Head

**Faculty**

Raafat Aburukba
Rana Ahmed
Abdul-Rahman Al-Ali
Gerassimos Barlas
Salam Dhou
Khaled El-Fakih
Hicham Hallal
Osameh Al-Kofahi
Taha Landolsi
Michel Pasquier
Ghassan Qadah
Assim Sagahyroon
Tamer Shanableh
Imran Zualkernan

## Bachelor of Science in Computer Engineering (BSCoE)

The Bachelor of Science in Computer Engineering program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Engineering Accreditation Commission of ABET, http://www.abet.org.

The phenomenal growth of the computer engineering field has been fueled by rapid advances in integrated circuits, microprocessors, software and networking technologies. Many of the modern products and services used in our daily life have been developed by computer hardware and software engineers. The primary purpose of the computer engineering program is to educate students with an understanding of digital systems, programming languages, computer architecture, computer networks, computer applications in industry and software engineering. These topics bridge traditional electrical engineering and computer science curricula. Computer engineers design, build and maintain integrated computer-based systems for home, business, government and industrial use. The undergraduate program in computer engineering prepares students for a wide range of positions in business and government service, as well as higher education, and research and development roles.

The curriculum satisfies the needs of the engineering community, especially in the United Arab Emirates and the Gulf region. The program includes general education requirements, an innovation and entrepreneurship requirement and major requirements for all computer engineering students. In addition, technical and free elective courses must be completed. A summer

professional training experience is required, as is a senior design project accomplished over a two-semester period.

Required laboratory courses provide hands-on experience and support class work and the senior project. The laboratories are equipped with state-of-the-art hardware, software and networking equipment.

**Mission Statement**

The mission of the computer engineering program at AUS is to educate students in the principles and modern practices of computer engineering, to prepare students to pursue a wide range of computer engineering careers, and to generate new knowledge by the pursuit of research in selected areas of computer engineering.

**Program Educational Objectives**

The objectives of the computer engineering program are to produce graduates who will:

- have successful careers as computer engineers, and become effective communicators, team members and leaders in industry and public sectors
- continue their professional development through continuing education and advanced studies
- be engaged in the global, ethical and social aspects of the profession and have a positive impact on local, regional and global communities

**Student Outcomes**

Upon graduation, an AUS graduate in computer engineering should demonstrate:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the engineering programs' second year admission requirements. For details, refer to Admission to Second Year/Engineering Programs earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more information, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

Students seeking the BSCoE degree must successfully complete the following minimum requirements:

- a minimum of 140 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 78 credit hours of major requirements, including a professional training for at least five weeks after the third year
  - a minimum of 12 credit hours of major electives
  - a minimum of six credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103 and MTH 104
- statistics requirement: satisfied through NGN 111
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through COE 490
- discipline specific writing intensive course requirement: satisfied through COE 491
- oral proficiency requirement: satisfied through COE 491
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through CMP 120

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (78 credit hours)**

- CMP 120 Programming I
- CMP 220 Programming II
- CMP 305 Data Structures and Algorithms
- CMP 310 Operating Systems
- COE 221 Digital Systems

- COE 241 Microcontrollers: Programming and Interfacing
- COE 312 Software Design for Engineers
- COE 341 Computer Architecture and Organization
- COE 370 Communications Networks
- COE 371 Computer Networks I
- COE 375 Modeling and Simulation of Stochastic Systems
- COE 397 Professional Training in Computer Engineering (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- COE 410 Embedded Systems: Design and Applications
- COE 420 Software Engineering
- COE 424 Advanced Digital System Design
- COE 490 Design Project I
- COE 491 Design Project II
- ELE 211 Electric Circuits I
- ELE 241 Electronics I
- ELE 241L Electronics I Laboratory
- ELE 323 Signal Processing
- ELE 341 Electronics II
- ELE 341L Electronics II Laboratory
- MTH 205 Differential Equations
- MTH 213 Discrete Mathematics
- MTH 221 Linear Algebra
- NGN 110 Introduction to Engineering and Computing
- NGN 111 Introduction to Statistical Analysis
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II

**Major Electives**
**(minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in courses selected from the following list of approved technical elective courses. At least six of the 12 credit hours should be from computer engineering (COE) courses.

- BME 422 Biomedical Imaging
- CMP 320 Database Systems
- CMP 352 Human Computer Interaction
- CMP 354 Mobile Application Development
- CMP 394/494 approved special topic courses in Computer Science. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- CMP 404 Cloud Computing
- CMP 418 Multicore Computing
- CMP 430 Computer Graphics
- CMP 433 Artificial Intelligence
- CMP 450 Object-Oriented Software Engineering
- CMP 454 Software Testing and Quality Engineering
- CMP 466 Machine Learning and Data Mining
- COE 394/494 special topic courses in computer engineering
- COE 425 Modern Computer Organizations
- COE 428 VLSI Design
- COE 431 Industrial Cyber Physical Systems
- COE 434 Wireless and Mobile Networks
- COE 444 Computer Security
- COE 457 Internet and Internet of Things (IoT) Programming
- COE 481 Real-time Industrial Networks
- ELE 311 Electromagnetics
- ELE 432 Medical Instrumentation I
- ELE 441 Microelectronic Devices

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives**
**(minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses at or above the 100 level, excluding BIS 101 and MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Computer Engineering (BSCoE)**

| FIRST YEAR (37 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **16** |
| Spring | MTH 104 | Calculus II | 3 |
| | NGN 111 | Introduction to Statistical Analysis | 2 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | WRI 102 | Academic Writing II | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | MTH 205 | Differential Equations | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **6** |

| SECOND YEAR (39 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CMP 120 | Programming I | 3 |
| | COE 221 | Digital Systems | 4 |
| | ELE 211 | Electric Circuits I | 3 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **16** |
| Spring | CMP 220 | Programming II | 3 |
| | COE 241 | Microcontrollers: Programming and Interfacing | 4 |
| | ELE 241 | Electronics I | 3 |
| | ELE 241L | Electronics I Laboratory | 1 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MTH 213 | Discrete Mathematics | 3 |
| | | **Total** | **17** |
| Summer | ENG 207 | Professional Communication for Engineers | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | | **Total** | **6** |

| THIRD YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CMP 305 | Data Structures and Algorithms | 3 |
| | COE 312 | Software Design for Engineers | 3 |
| | COE 341 | Computer Architecture and Organization | 3 |
| | COE 370 | Communications Networks | 3 |
| | ELE 341 | Electronics II | 3 |
| | ELE 341L | Electronics II Laboratory | 1 |
| | | **Total** | **16** |
| Spring | CMP 310 | Operating Systems | 3 |
| | COE 371 | Computer Networks I | 3 |
| | COE 375 | Modeling and Simulation of Stochastic Systems | 3 |
| | COE 424 | Advanced Digital System Design | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **15** |
| Summer | COE 397 | Professional Training in Computer Engineering | 0 |

| FOURTH YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | COE 410 | Embedded Systems: Design and Applications | 3 |
| | COE 420 | Software Engineering | 3 |
| | COE 490 | Design Project I | 1 |
| | ELE 323 | Signal Processing | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **16** |
| Spring | COE 491 | Design Project II | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **17** |

## Bachelor of Science in Computer Science (BSCS)

The Bachelor of Science in Computer Science program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Computing Accreditation Commission of ABET, http://www.abet.org.

The program is designed to meet the growing needs for computer science experts in the rapidly evolving 21st century economy. It provides graduates with a strong computer science base that will enable them to capitalize on increasing career opportunities in the information technology sector, especially software-related fields; to expand the limits of their knowledge by pursuing further graduate studies; and to explore innovative approaches to computer-related problems. A computer science degree from AUS provides the graduate with a highly demanded level of expertise, great mobility and flexibility, and a wide range of career choices in the broad software and information technology industry.

The program includes general education requirements, an innovation and entrepreneurship requirement and major requirements. In addition, technical and free elective courses are required. A senior design project is also completed in close coordination with a faculty advisor over a two-course sequence. A summer professional training experience is required.

### Mission Statement

The mission of the computer science program at AUS is to deliver a modern curriculum that will equip graduates with strong theoretical and practical backgrounds to enable them to excel in the workplace and to be lifelong learners.

### Program Educational Objectives

The objectives of the computer science program are to produce graduates who will:

- have successful careers in the field of computer science
- be effective communicators, team members and leaders that add value to employers and businesses regionally and globally
- stay current in emerging technologies through training, self-learning and/or graduate studies
- be engaged in the ethical, legal and social issues faced in their workplace and contribute positively to the community

**Student Outcomes**

Upon graduation, an AUS graduate in computer science should demonstrate an ability to:

- analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions
- design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline
- communicate effectively in a variety of professional contexts
- recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles
- function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline
- apply computer science theory and software development fundamentals to produce computing-based solutions

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the program's second year admission requirements. For details, refer to Admission to Second Year/Computer Science Program earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

Students seeking the BSCS degree must successfully complete the following minimum requirements:

- a minimum of 130 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 45 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 61 credit hours of major requirements, including a professional training for at least five weeks
  - a minimum of 12 credit hours of major electives
  - a minimum of nine credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 45 credit hours)**

Students must successfully complete a minimum of 45 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credits
- natural sciences requirement: a minimum of 12 credit hours from CHM, BIO or PHY. Two out of the three courses must be in the same area.
- mathematics requirement: MTH 103
- statistics requirement: STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI)courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through CMP 235
- discipline specific writing intensive course requirement: satisfied through CMP 490
- oral proficiency requirement: satisfied through CMP 490
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through CMP 120

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (61 credit hours)**

- CMP 120 Programming I
- CMP 213 Discrete Structures
- CMP 220 Programming II
- CMP 235 Ethics for Computing and Information Technology
- CMP 256 GUI Design and Programming
- CMP 305 Data Structures and Algorithms
- CMP 310 Operating Systems
- CMP 320 Database Systems
- CMP 321 Programming Languages
- CMP 340 Design and Analysis of Algorithms
- CMP 397 Professional Training in Computer Science (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- CMP 416 Internet and Network Computing
- CMP 490 Project in Computer Science I
- CMP 491 Project in Computer Science II
- COE 221 Digital Systems
- COE 251 Introduction to Computer Systems
- COE 371 Computer Networks I
- COE 420 Software Engineering
- MTH 104 Calculus II
- MTH 221 Linear Algebra
- MTH 343 Numerical Analysis I
- NGN 110 Introduction to Engineering and Computing
- STA 201 Introduction to Statistics for Engineering and Natural Sciences

**Major Electives (minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in courses selected from the following list. At least six credit hours of the 12 credit hours should be from computer science (CMP) courses.

- CMP 352 Human Computer Interaction
- CMP 354 Mobile Application Development
- CMP 394/494 special topic courses in computer science
- CMP 404 Cloud Computing
- CMP 418 Multicore Computing

- CMP 430 Computer Graphics
- CMP 433 Artificial Intelligence
- CMP 450 Object-oriented Software Engineering
- CMP 454 Software Testing and Quality Engineering
- CMP 466 Machine Learning and Data Mining
- COE 341 Computer Architecture and Organization
- COE 370 Communications Networks
- COE 394/494 approved special topic courses in computer engineering. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- COE 434 Wireless and Mobile Networks
- COE 444 Computer Security
- COE 457 Internet and Internet of Things (IoT) Programming

AMP students may use approved graduate-level courses, successfully complete while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours of in courses at or above the 100 level, excluding BIS 101 and MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science Degree in Computer Science (BSCS)**

| FIRST YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-SCI | Natural Sciences | 4 |
| | | **Total** | **15** |
| Spring | CMP 120 | Programming I | 3 |
| | MTH 104 | Calculus II | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-SCI | Natural Sciences | 4 |
| | | **Total** | **16** |

| SECOND YEAR (31 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CMP 213 | Discrete Structures | 3 |
| | CMP 220 | Programming II | 3 |
| | COE 221 | Digital Systems | 4 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | | **Total** | **16** |
| Spring | CMP 235 | Ethics for Computing and Information Technology | 3 |
| | CMP 256 | GUI Design and Programming | 3 |
| | CMP 305 | Data Structures and Algorithms | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | | **Total** | **15** |

| THIRD YEAR (35 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CMP 320 | Database Systems | 3 |
| | CMP 340 | Design and Analysis of Algorithms | 3 |
| | COE 251 | Introduction to Computer Systems | 4 |
| | ENG 207 | Professional Communication for Engineers | 3 |
| | GER-SCI | Natural Sciences | 4 |
| | | **Total** | **17** |
| Spring | CMP 310 | Operating Systems | 3 |
| | CMP 321 | Programming Languages | 3 |
| | COE 371 | Computer Networks I | 3 |
| | COE 420 | Software Engineering | 3 |
| | MTH 343 | Numerical Analysis I | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **18** |
| Summer | CMP 397 | Professional Training in Computer Science | 0 |

| FOURTH YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CMP 416 | Internet and Network Computing | 3 |
| | CMP 490 | Project in Computer Science I | 1 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Spring | CMP 491 | Project in Computer Science II | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **17** |

## Minor in Computer Engineering

Students enrolling in the computer engineering minor should have completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in computer engineering, and depending on the option of their choice, must successfully complete the following requirements:

- a minimum of 20 credit hours for option 1, or a minimum of 19 credit hours for option 2, including:
  - 11 credit hours of minor requirements for option 1; 10 credit hours for option 2
  - a minimum of nine credit hours of minor electives
- a minimum of 10 credit hours of the 20 credit hours required for the minor successfully completed in residence at AUS; nine credit hours for option 2
- a minimum of seven credit hours of the courses at or above the 300 level successfully completed in residence at AUS; six credit hours for option 2

- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (10/11 credit hours)**

Student must successfully complete the requirements of one of the following two options:

*Option 1 (11 credit hours)*

- COE 221 Digital Systems
- COE 241 Microcontrollers: Programming and Interfacing
- ELE 341 Electronics II

*Option 2 (10 credit hours)*

- COE 221 Digital Systems
- COE 341 Computer Architecture and Organization
- COE 424 Advanced Digital System Design

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in 300-level or above COE courses, except COE 490 and COE 491.

### Minor in Computer Science

Students enrolling in the computer science minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in computer science must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements for computer engineering students; 12 credit hours of minor requirements for non-computer engineering students
  - a minimum of nine credit hours of minor electives for computer engineering students; a minimum of six credit hours of minor electives for non-computer engineering students
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9/12 credit hours)**

- Computer engineering students must successfully complete the following courses:
  - CMP 305 Data Structures and Algorithms
  - CMP 310 Operating Systems
  - COE 420 Software Engineering
- Non-computer engineering students must successfully complete the following courses:
  - CMP 120 Programming I
  - CMP 220 Programming II
  - CMP 305 Data Structures and Algorithms
  - MTH 213 Discrete Mathematics

**Minor Electives (minimum of 6/9 credit hours)**

- Computer engineering students must successfully complete a minimum of nine credit hours in 300-level or above CMP courses, excluding CMP 490 and CMP 491.
- Non-computer engineering students must successfully complete a minimum of six credit hours in 300-level or above CMP courses, excluding CMP 490 and CMP 491. Students may also take COE 370 to meet this requirement.

## Department of Electrical Engineering

Nasser Qaddoumi, Head

**Faculty**

Lutfi Albasha
Hasan Al-Nashash
Rached Dhaouadi
Mohamed El-Tarhuni
Oualid Hammi
Mohamed Hassan
Mahmoud Ibrahim Ismail
Hasan Mir
Shayok Mukhopadhyay
Ahmed Osman-Ahmed
Habib-ur Rehman
Mostafa Shaaban
Usman Tariq
Ming Foey Teng
Amer Zakaria

## Bachelor of Science in Electrical Engineering (BSEE)

The Bachelor of Science in Electrical Engineering program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Engineering Accreditation Commission of ABET, http://www.abet.org.

The electrical engineering curriculum is a four-year program leading to a Bachelor of Science in Electrical Engineering (BSEE). The program is based on a solid foundation of science and mathematics needed to understand advanced engineering topics and applications. The curriculum is designed with the aim of providing breadth and depth of knowledge and significant design experience across the key areas of electrical engineering that evolve with society's needs. The Department of Electrical Engineering provides access to state-of-the-art resources in communications, control and instrumentation, digital signal processing, microelectronics, electromagnetics and microwaves, electric drives, power systems and biomedical electronics.

Faculty members are committed to helping students develop the intellectual, technological and personal skills that allow them to excel in both academia and electrical engineering careers. AUS electrical engineering graduates should be able to employ their knowledge, analysis and design skills to realize engineering systems and advance the frontiers of science and technology.

**Mission Statement**

The mission of the electrical engineering program at AUS is to promote and maintain excellence in teaching and learning to equip students with strong core competencies in electrical engineering and empower them with the skills required for successful professional careers. The electrical engineering program promotes and enhances faculty expertise in research and development towards providing technical solutions for social challenges and community advancement through outreach activities and networking with regional and international organizations.

**Program Educational Objectives**

The objectives of the electrical engineering program are to produce graduates who will:

- be a successful engineer as a member or a leader of a team that comprises a diverse group of professionals
- possess effective communication skills and continue to improve technical and non-technical competencies through engagement in professional activities, projects and/or graduate studies
- be a holistic citizen demonstrating social, ethical and professional responsibilities

**Student Outcomes**

Upon graduation, an AUS graduate in electrical engineering should demonstrate:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of

public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the engineering programs' second year admission requirements. For details, refer to Admission to Second Year/Engineering Programs earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

Students seeking the BSEE degree must successfully complete the following minimum requirements:

- a minimum of 140 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 77 credit hours of major requirements, including a professional training for at least five weeks
  - a minimum of 13 credit hours of major electives
  - a minimum of six credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103 and MTH 104
- statistics requirement: satisfied through NGN 111
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through ELE 490
- discipline specific writing intensive course requirement: satisfied through ELE 491
- oral proficiency requirement: satisfied through ELE 491
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through CMP 120

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (77 credit hours)**

- CMP 120 Programming I
- COE 221 Digital Systems
- COE 241 Microcontrollers: Programming and Interfacing
- ELE 211 Electric Circuits I
- ELE 212 Electric Circuits II
- ELE 241 Electronics I
- ELE 241L Electronics I Laboratory
- ELE 311 Electromagnetics
- ELE 321 Signals and Systems
- ELE 324 Digital Signal Processing
- ELE 332L Measurements and Instrumentation Laboratory
- ELE 341 Electronics II
- ELE 341L Electronics II Laboratory
- ELE 351 Electrical Energy Conversion
- ELE 353 Control Systems I
- ELE 353L Control Systems I Laboratory
- ELE 360 Probability and Stochastic Processes
- ELE 361 Communications
- ELE 361L Communications Laboratory
- ELE 371 Power Systems Analysis
- ELE 371L Electric Machines and Power Systems Laboratory
- ELE 397 Professional Training in Electrical Engineering (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- ELE 490 Electrical Engineering Design Project I
- ELE 491 Electrical Engineering Design Project II
- MCE 224 Engineering Mechanics—Statics and Dynamics
- MTH 203 Calculus III
- MTH 205 Differential Equations
- MTH 221 Linear Algebra
- NGN 110 Introduction to Engineering and Computing
- NGN 111 Introduction to Statistical Analysis
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II

**Major Electives**
**(minimum of 13 credit hours)**

Students must successfully complete a minimum of 13 credit hours, including a one-credit laboratory, in courses selected from the following list of approved major electives. Students may choose to complete one course from the non-ELE courses on the list.

- BME 410 Biomedical Systems Modeling I or
  CHE 481 Fundamentals of Biomedical Engineering
- BME 422 Biomedical Imaging
- BME 430 Biomechanics
- COE 370 Communications Networks
- COE 371 Computer Networks I
- COE 410 Embedded Systems: Design and Applications
- COE 428 VLSI Design
- ELE 432 Medical Instrumentation
- ELE 439L Medical Electronics Systems Laboratory
- ELE 440 Radio Transceivers Design and Analysis
- ELE 441 Microelectronic Devices
- ELE 444 Control Systems II
- ELE 451 Wireless Communications
- ELE 452 Digital Communications
- ELE 453 Microwave Engineering
- ELE 454 Antennas and Wave Propagation
- ELE 456 Pattern Recognition
- ELE 457 Satellite Communications
- ELE 458 Multimedia Communications and Networking
- ELE 458L Communications Systems Laboratory
- ELE 459 Introduction to Radar Systems
- ELE 471 Digital Control Systems
- ELE 476L Instrumentation and Control Systems Laboratory
- ELE 478L Design Laboratory
- ELE 481 Power System Protection
- ELE 482 Electric Power Distribution Systems
- ELE 485 Power Electronics
- ELE 486 Electric Drives
- ELE 487 Power Conversion in Renewable Energy Systems
- ELE 488L Power Engineering Laboratory
- ELE 494 special topic courses in electrical engineering
- MCE 451 Renewable Energy Systems
- MCE 464 Introduction to Robotics

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives**
**(minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses at or above the 100 level, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Electrical Engineering (BSEE)**

| FIRST YEAR (37 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **16** |
| Spring | MTH 104 | Calculus II | 3 |
| | NGN 111 | Introduction to Statistical Analysis | 2 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | WRI 102 | Academic Writing II | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | MTH 205 | Differential Equations | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **6** |

| SECOND YEAR (38 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CMP 120 | Programming I | 3 |
| | ELE 211 | Electric Circuits I | 3 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | MTH 203 | Calculus III | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | | **Total** | **15** |
| Spring | COE 221 | Digital Systems | 4 |
| | ELE 212 | Electric Circuits II | 3 |
| | ELE 241 | Electronics I | 3 |
| | ELE 241L | Electronics I Laboratory | 1 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MCE 224 | Engineering Mechanics—Statics and Dynamics | 3 |
| | | **Total** | **17** |
| Summer | ELE 351 | Electrical Energy Conversion | 3 |
| | ENG 207 | Professional Communication for Engineers | 3 |
| | | **Total** | **6** |

| THIRD YEAR (35 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | COE 241 | Microcontrollers: Programming and Interfacing | 4 |
| | ELE 311 | Electromagnetics | 3 |
| | ELE 321 | Signals and Systems | 3 |
| | ELE 341 | Electronics II | 3 |
| | ELE 341L | Electronics II Laboratory | 1 |
| | ELE 353 | Control Systems I | 3 |
| | | **Total** | **17** |
| Spring | ELE 324 | Digital Signal Processing | 3 |
| | ELE 332L | Measurements and Instrumentation Laboratory | 1 |
| | ELE 353L | Control Systems I Laboratory | 1 |
| | ELE 360 | Probability and Stochastic Processes | 3 |
| | ELE 361 | Communications | 3 |
| | ELE 371 | Power Systems Analysis | 3 |
| | ELE 371L | Electric Machines and Power Systems Laboratory | 1 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **18** |
| Summer | ELE 397 | Professional Training in Electrical Engineering | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ELE 361L | Communications Laboratory | 1 |
| | ELE 490 | Electrical Engineering Design Project I | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Spring | ELE 491 | Electrical Engineering Design Project II | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective Laboratory | 1 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

## Minor in Electrical Engineering

Students enrolling in the electrical engineering minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in electrical engineering must successfully complete the following requirements:

- a minimum of 20 credit hours including:
  - 10 credit hours of minor requirements
  - a minimum of 10 credit hours of minor electives
- a minimum of 10 credit hours of the 20 credit hours required for the minor successfully completed in residence at AUS
- a minimum of seven credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor.

**Minor Requirements (10 credit hours)**

Students must successfully complete the following courses:

- ELE 212 Electric Circuits II
- ELE 241 Electronics I
- ELE 241L Electronics I Laboratory
- ELE 351 Electrical Energy Conversion

**Minor Electives (minimum of 10 credit hours)**

Students must successfully complete a minimum of 10 credit hours as follows:

- a maximum of two 300-level ELE courses
- a minimum of one 400-level ELE course, excluding ELE 490 and ELE 491
- any 300-level ELE laboratory

## Department of Industrial Engineering

Moncer Hariga, Head

**Faculty**

Vian Ahmed
Hussam Alshraideh
Rami Afif As'ad
Mahmoud Ismail Awad
Zied Bahroun
Mohamed BenDaya
Hazim El-Baz
Noha Hassan
Malik Ndiaye
Mojahid Osman
Abdulrahim Shamayleh

# Bachelor of Science in Industrial Engineering (BSIE)

The industrial engineering program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Engineering Accreditation Commission of ABET, http://www.abet.org.

The industrial engineering curriculum is a four-year program leading to a Bachelor of Science in Industrial Engineering (BSIE). The program is designed with the aim of graduating engineers with the knowledge and skills necessary to function as professional engineers in a working environment where cost effectiveness, high productivity, continuous quality and reliability improvements, waste reduction, and efficient resource utilization are critical success factors for organizations. These skills will help industrial engineering graduates to build successful careers in several engineering professions such as facility design and planning; production planning, scheduling and control; quality control; warehousing and inventory control; supply chain and logistics engineering; and maintenance engineering. Furthermore, industrial engineering graduates have the abilities to work in manufacturing as well service-oriented organizations such as banks, health care, utilities and transportation services. They are able to immediately deliver significant business improvements and economic savings to their company of employment.

**Mission Statement**

The mission of the industrial engineering program at AUS is to promote and maintain excellence in teaching and learning to equip students with strong core competencies in industrial engineering and empower them with the skills required for successful professional careers. The industrial engineering program promotes and enhances faculty expertise in research and development toward providing technical solutions for social challenges and community advancement through outreach activities and networking with regional and international organizations.

**Program Educational Objectives**

The objectives of the industrial engineering program are to produce graduates who will:

- have successful careers as industrial engineers, especially in the fields of logistics and supply chain engineering, as well as quality and maintenance engineering
- think independently and communicate effectively as team members and team leaders
- practice engineering considering global, ethical and social factors
- continue their professional development through further education and advanced studies

**Student Outcomes**

Upon graduation, an AUS graduate in industrial engineering should demonstrate:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

### Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the engineering programs' second year admission requirements. For details, refer to Admission to Second Year/Engineering Programs earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

### Degree Requirements

Students seeking the BSIE degree must successfully complete the following minimum requirements:

- a minimum of 140 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 78 credit hours of major requirements, including a professional training for at least five weeks
  - a minimum of 12 credit hours of major electives
  - a minimum of six credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours

  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103 and MTH 104
- statistics requirement: satisfied through STA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through INE 490
- discipline-specific writing intensive course requirement: satisfied through INE 491
- oral proficiency requirement: satisfied through INE 491
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through CMP 120

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (78 credit hours)**

- CMP 120 Programming I
- EGM 364 Engineering Economy
- ELE 225 Electric Circuit and Devices
- INE 201 Introduction to Industrial Engineering
- INE 222 Operations Research I
- INE 301 Manufacturing Processes for Industrial Engineers
- INE 311 Quality Engineering
- INE 322 Operations Research II
- INE 323 Stochastic Processes and Simulation
- INE 331 Analysis of Production Systems
- INE 332 Analysis of Supply Chains
- INE 333 Facility Design and Operations
- INE 397 Professional Training in Industrial Engineering (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- INE 413 Maintenance Engineering
- INE 431 Industrial Scheduling
- INE 439 Fundamentals of Manufacturing Systems
- INE 490 Senior Design Project I
- INE 491 Senior Design Project II
- MCE 216L Introduction to Engineering Drawing and Workshop
- MCE 224 Engineering Mechanics–Statics and Dynamics
- MCE 230 Materials Science
- MGT 403 Entrepreneurship
- MIS 201 Fundamentals of Management Information Systems
- MTH 203 Calculus III
- MTH 205 Differential Equations
- MTH 221 Linear Algebra
- NGN 110 Introduction to Engineering and Computing
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II
- STA 201 Introduction to Statistics for Engineering and Natural Sciences

**Major Electives (minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in courses selected from the following list. A minimum of nine credit hours must be from INE courses.

- FIN 430 Financial Forecasting
- INE 415 Design of Experiments
- INE 416 Reliability Engineering
- INE 417 Six Sigma Methodology
- INE 425 Decision Analysis
- INE 433 Logistics Engineering
- INE 435 Warehousing Systems
- INE 450 Safety Engineering
- INE 460 Industrial Resources Planning
- INE 494 special topic courses in industrial engineering
- STA 401 Introduction to Data Mining

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses at or above the 100 level, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Industrial Engineering (BSIE)**

| FIRST YEAR (38 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **16** |
| Spring | CMP 120 | Programming I | 3 |
| | MTH 104 | Calculus II | 3 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **16** |
| Summer | MTH 221 | Linear Algebra | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | | **Total** | **6** |

| SECOND YEAR (36 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 204 | Advanced Academic Writing | 3 |
| | INE 201 | Introduction to Industrial Engineering | 2 |
| | MCE 216L | Introduction to Engineering Drawing and Workshop | 1 |
| | MCE 224 | Engineering Mechanics—Statics and Dynamics | 3 |
| | MTH 205 | Differential Equations | 3 |
| | STA 201 | Introduction to Statistics for Engineering and Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | INE 222 | Operations Research I | 3 |
| | MCE 230 | Materials Science | 3 |
| | MIS 201 | Fundamentals of Management Information Systems | 3 |
| | MTH 203 | Calculus III | 3 |
| | | **Total** | **15** |
| Summer | ENG 207 | Professional Communication for Engineers | 3 |
| | ELE 225 | Electric Circuit and Devices | 3 |
| | | **Total** | **6** |

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | EGM 364 | Engineering Economy | 3 |
| | INE 322 | Operations Research II | 3 |
| | INE 331 | Analysis of Production Systems | 3 |
| | INE 301 | Manufacturing Processes for Industrial Engineers | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Spring | INE 311 | Quality Engineering | 3 |
| | INE 323 | Stochastic Processes and Simulation | 3 |
| | INE 332 | Analysis of Supply Chains | 3 |
| | INE 333 | Facility Design and Operations | 3 |
| | INE 439 | Fundamentals of Manufacturing Systems | 3 |
| | | **Total** | **15** |
| Summer | INE 397 | Professional Training in Industrial Engineering | 0 |

| FOURTH YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | INE 413 | Maintenance Engineering | 3 |
| | INE 431 | Industrial Scheduling | 3 |
| | INE 490 | Senior Design Project I | 1 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **16** |
| Spring | INE 491 | Senior Design Project II | 2 |
| | MGT 403 | Entrepreneurship | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **17** |

# Department of Mechanical Engineering

Mamoun Abdel-Hafez, Head

**Faculty**

Mohamed Omar Abdelgawad
Bassam Abu-Nabah
Wael Abuzaid
Maen Alkhader
Basil Darras
Samir Emam
Mohamed Gadalla
Mehdi Ghommem
Mohammad Hamdan
Mohammad Jaradat
Sathish Kannan
Mohammad Nazzal
Mehmet Fatih Orhan
Lotfi Romdhane

## Bachelor of Science in Mechanical Engineering (BSME)

The Bachelor of Science in Mechanical Engineering program is accredited by the Commission for Academic Accreditation of the Ministry of Education's Higher Education Affairs Division in the United Arab Emirates, as well as the Engineering Accreditation Commission of ABET, http://www.abet.org.

Mechanical engineering provides an excellent broad education for today's technological world. Mechanical engineers model, analyze, test and manufacture engines that power ground and aerospace vehicles. They also design, operate and modify power plants that convert the energy in fuels, wind and sunlight into electricity and other forms of energy, and they construct intelligent machines and robots in industry. Mechanical engineers also build prototypes of conventional, electric and sports vehicles, develop energy management systems for industry, design and manufacture smart products, and develop new engineering materials that are used in manufacturing high-tech products. Mechanical engineers use computers extensively in their everyday operation; they develop computer control systems for automobiles and industrial processes and design computer interfaces to mechanical and energy systems. Mechanical engineers also develop alternative energy sources such as solar, fuel cells, wind and alternative fuels. They are heavily involved in new technologies such as MEMS, nanosystems and biotechnologies. In short, the mechanical engineer is a vital backbone element of the engineering profession.

The BSME curriculum produces high-quality graduates whose work is notable for its breadth and technical excellence. Graduates have the ability to work logically, accurately and

efficiently; to gather and use information effectively; and to continue enhancing their careers through lifelong learning. The program stresses the effective use of technology, information resources and engineering tools. It prepares graduates to work in a broad range of areas related to the mechanical engineering profession. The program instills leadership qualities based on moral and ethical principles coupled with sound and rational judgment. Finally, the program is designed to prepare interested students for graduate studies in mechanical engineering and other areas of professional practice.

**Mission Statement**

The mission of the mechanical engineering program at AUS is to educate the engineers of tomorrow by integrating classroom theory and hands-on experience, emphasizing the process of learning and critical thinking, conducting cutting-edge research, and serving the engineering profession, industry and society at large. The mechanical engineering program fosters lifelong learning, ethics and professional development, and embraces diversity among its faculty and student body.

**Program Educational Objectives**

The objectives of the mechanical engineering program are to produce graduates who will:

- actively embrace leadership roles in the practice of mechanical engineering, conduct research and development to advance technology and foster innovation, and apply their engineering problem-solving skills as needed in the workplace
- actively participate in on-going professional development, updating and adapting their core knowledge, and acquiring new knowledge and skills to pursue new career opportunities
- serve the engineering profession and support sustainable development

**Student Outcomes**

Upon graduation, an AUS graduate in mechanical engineering should demonstrate:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

## Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the engineering programs' second year admission requirements. For details, refer to Admission to Second Year/Engineering Programs earlier in this section of the catalog.

AUS students transferring into the program must be in good academic standing and must meet the requirements set by the program. In the event that there are more qualified AUS students transferring into the major than available spaces, students will be admitted based on academic achievement. For more details, please check with the head of the department or the college associate dean. For information on how to submit a change of major request, please refer to Fields of Study/Change of Major under the Academic Policies and Regulations section earlier in the catalog.

## Degree Requirements

Students seeking the BSME degree must successfully complete the following minimum requirements:

- a minimum of 140 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 41 credit hours in general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 81 credit hours of major requirements, including a professional training for at least five weeks
  - a minimum of nine credit hours of major electives
  - a minimum of six credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 41 credit hours)**

Students must successfully complete a minimum of 41 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the core general education requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: CHM 101, PHY 101 and PHY 101L
- mathematics requirement: MTH 103 and MTH 104
- statistics requirement: satisfied through NGN 111
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses and/or 200-level and above English (ENG) courses, including ENG 204 and ENG 207
- ethical understanding requirement: satisfied through MCE 490
- discipline specific writing intensive course requirement: satisfied through MCE 491
- oral proficiency requirement: satisfied through MCE 490
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through MCE 226L

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (81 credit hours)**

- ELE 225 Electric Circuits and Devices
- MCE 216L Introduction to Engineering Drawing and Workshop
- MCE 220 Statics
- MCE 222 Dynamics
- MCE 223 Mechanics of Materials
- MCE 226L Computer Applications in Mechanical Engineering I
- MCE 230 Materials Science
- MCE 236L Solid Modeling
- MCE 240 Fluid Mechanics
- MCE 241 Thermodynamics I
- MCE 311 Engineering Measurements
- MCE 321 Mechanical Design I
- MCE 322 Mechanical Design II
- MCE 325 Numerical Methods in Engineering
- MCE 326L Computer Applications in Mechanical Engineering II
- MCE 328 Dynamic Systems
- MCE 331 Manufacturing Processes
- MCE 332L Materials and Manufacturing Processes Laboratory
- MCE 341 Thermodynamics II
- MCE 344 Heat Transfer
- MCE 345L Thermofluids Laboratory
- MCE 397 Professional Training in Mechanical Engineering (also satisfied through NGN 497 Professional Experience in Engineering and Computing completed as a free elective)
- MCE 410 Control Systems
- MCE 415L Dynamics and Control Systems Laboratory
- MCE 416 Kinematics and Dynamics of Machinery or
  MCE 446 Refrigeration and Air Conditioning
- MCE 482 Intermediate Fluid Mechanics
- MCE 490 Design Project I
- MCE 491 Design Project II
- MTH 203 Calculus III
- MTH 205 Differential Equations
- MTH 221 Linear Algebra
- NGN 110 Introduction to Engineering and Computing
- NGN 111 Introduction to Statistical Analysis
- PHY 102 General Physics II
- PHY 102L General Physics Laboratory II

**Major Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- ASE 415 Aircraft Stability and Control
- ASE 450 Applied Aerodynamics
- ASE 452 Aerospace Propulsion
- BME 430 Biomechanics
- either of the following two courses not used as a major requirement:
  - MCE 416 Kinematics and Dynamics of Machinery
  - MCE 446 Refrigeration and Air Conditioning
- MCE 418 Vehicle Dynamics
- MCE 423 Mechanical Vibrations
- MCE 434 Fundamentals of Computer-Aided Design and Manufacturing
- MCE 435 Advanced Mechanics of Materials
- MCE 438 Inspection and Nondestructive Testing
- MCE 439 Computer Integrated Manufacturing
- MCE 445 Energy Systems
- MCE 447 Internal Combustion Engines
- MCE 450 Energy Conservation and Management
- MCE 451 Renewable Energy Systems
- MCE 452 Fuel Cells and Hydrogen Systems
- MCE 464 Introduction to Robotics
- MCE 466 Introduction to Mechatronics
- MCE 473 Applied Finite Element Analysis
- MCE 477 Composite Materials
- MCE 485 Hydraulics of Pipeline Systems
- MCE 487 Turbomachines
- MCE 488 Introduction to Computational Fluid Dynamics
- MCE 494 approved special topic courses in mechanical engineering. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses at or above the 100 level, excluding MTH 101.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Science in Mechanical Engineering (BSME)**

| FIRST YEAR (37 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | CHM 101 | General Chemistry I | 4 |
| | MTH 103 | Calculus I | 3 |
| | NGN 110 | Introduction to Engineering and Computing | 2 |
| | PHY 101 | General Physics I | 3 |
| | PHY 101L | General Physics Laboratory I | 1 |
| | WRI 101 | Academic Writing I | 3 |
| | | **Total** | **16** |
| Spring | MTH 104 | Calculus II | 3 |
| | NGN 111 | Introduction to Statistical Analysis | 2 |
| | PHY 102 | General Physics II | 3 |
| | PHY 102L | General Physics Laboratory II | 1 |
| | WRI 102 | Academic Writing II | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Summer | MTH 205 | Differential Equations | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | | **Total** | **6** |

| SECOND YEAR (39 CREDIT HOURS) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 204 | Advanced Academic Writing | 3 |
| | MCE 216L | Introduction to Engineering Drawing and Workshop | 1 |
| | MCE 220 | Statics | 3 |
| | MCE 230 | Materials Science | 3 |
| | MCE 241 | Thermodynamics I | 3 |
| | MTH 221 | Linear Algebra | 3 |
| | | **Total** | **16** |
| Spring | ELE 225 | Electric Circuits and Devices | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MCE 222 | Dynamics | 3 |
| | MCE 223 | Mechanics of Materials | 3 |
| | MCE 226L | Computer Applications in Mechanical Engineering I | 1 |
| | MCE 236L | Solid Modeling | 1 |
| | MCE 240 | Fluid Mechanics | 3 |
| | | **Total** | **17** |
| Summer | ENG 207 | Professional Communication for Engineers | 3 |
| | MTH 203 | Calculus III | 3 |
| | | **Total** | **6** |

| THIRD YEAR (33 CREDIT HOURS) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MCE 311 | Engineering Measurements | 3 |
| | MCE 321 | Mechanical Design I | 3 |
| | MCE 326L | Computer Applications in Mechanical Engineering II | 1 |
| | MCE 331 | Manufacturing Processes | 3 |
| | MCE 332L | Materials and Manufacturing Processes Laboratory | 1 |
| | MCE 341 | Thermodynamics II | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **17** |
| Spring | MCE 322 | Mechanical Design II | 3 |
| | MCE 325 | Numerical Methods in Engineering | 3 |
| | MCE 328 | Dynamic Systems | 3 |
| | MCE 344 | Heat Transfer | 3 |
| | MCE 345L | Thermofluids Laboratory | 1 |
| | FRE | Free Elective | 3 |
| | | **Total** | **16** |
| Summer | MCE 397 | Professional Training in Mechanical Engineering | 0 |

| FOURTH YEAR (31 CREDIT HOURS) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MCE 410 | Control Systems | 3 |
| | MCE 416 or MCE 446 | Kinematics and Dynamics of Machinery or Refrigeration and Air Conditioning | 3 |
| | MCE 482 | Intermediate Fluid Mechanics | 3 |
| | MCE 490 | Design Project I | 1 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **16** |
| Spring | MCE 415L | Dynamics and Control Systems Laboratory | 1 |
| | MCE 491 | Design Project II | 2 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | | **Total** | **15** |

## Minor in Mechanical Engineering

Students enrolling in the mechanical engineering minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in mechanical engineering must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Student must successfully complete the requirements of one of the following two options:

*Option 1*

- MCE 222 Dynamics or MCE 224 Engineering Mechanics—Statics and Dynamics
- MCE 223 Mechanics of Materials
- MCE 240 Fluid Mechanics or MCE 241 Thermodynamics I

*Option 2*

- MCE 223 Mechanics of Materials or MCE 222 Dynamics or MCE 224 Engineering Mechanics—Statics and Dynamics
- MCE 240 Fluid Mechanics
- MCE 241 Thermodynamics I

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in 300-level or above MCE courses, excluding MCE 490 and MCE 491. INE 439 meets this requirement. Students cannot earn credit hours for both INE 439 and MCE 439.

# Other Minors Offered by the College of Engineering

## Minor in Aerospace Engineering

Samir Emam, Coordinator

Aerospace engineering deals with the analysis, design and performance of flight vehicles such as transport and military aircraft, helicopters, missiles and launch vehicles (rockets), and spacecraft such as the space shuttle. Aerospace engineering comprises several disciplines, namely aerodynamics, flight dynamics and control, avionics and navigation, aerospace propulsion, aerospace structures and materials, and aerospace manufacturing among others. Aerospace engineers apply their knowledge and skills to the design of aircraft components (e.g., wings and fuselages), systems (e.g., control systems) or spacecraft components and systems. This minor focuses on aeronautical engineering.

Students seeking a minor in aerospace engineering must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete nine credit hours in courses selected from the following list:

- ASE 415 Aircraft Stability and Control
- ASE 450 Applied Aerodynamics
- ASE 452 Aerospace Propulsion
- MCE 477 Composite Materials

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following list:

- ASE 454 Thermal Design Issues for Aerospace Systems
- ASE 470 Aircraft Structure
- ASE 475 Aircraft Design
- ASE 494 Special Topics in Aerospace Engineering
- MCE 410 Control Systems
- MCE 435 Advanced Mechanics of Materials
- MCE 438 Inspection and Nondestructive Testing
- MCE 473 Applied Finite Element Analysis
- MCE 482 Intermediate Fluid Mechanics
- MCE 487 Turbomachines
- MCE 488 Introduction to Computational Fluid Dynamics
- any of the following courses not used as a minor requirement:
  - ASE 415 Aircraft Stability and Control
  - ASE 450 Applied Aerodynamics
  - ASE 452 Aerospace Propulsion
  - MCE 477 Composite Materials
- any approved MCE special topic course. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Biomedical Engineering

Hasan Al-Nashash, Coordinator

Biomedical engineering is a multidisciplinary field that combines principles of physics, chemistry and biology with engineering sciences to study and advance knowledge in biology, physiology and human health. A biomedical engineer can develop diagnostic instruments, novel materials, drug delivery systems or informatics, for example. The main objective for a biomedical engineer is to improve the quality of life for patients, and to help in the advancement of health professions.

Students enrolling in the biomedical engineering minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in biomedical engineering must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 14 credit hours of minor requirements
  - a minimum of four credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (14 credit hours)**

Students must successfully complete the following courses:

- BIO 101 General Biology I
- BIO 210 Introduction to Human Anatomy and Physiology
- BME 210 Biomedical Ethics
- Two courses from the following:
  - BME 410 Biomedical Systems Modeling I or CHE 481 Fundamentals of Biomedical Engineering
  - BME 420 Biomedical Electronics I or ELE 432 Medical Instrumentation I
  - BME 430 Biomechanics

**Minor Electives (minimum of 4 credit hours)**

Students must successfully complete a minimum of four credit hours in courses selected from the following list:

- BIO 341 Principles of Pharmacology
- BME 411 Biomedical Systems Modeling II
- BME 421 Biomedical Electronics II
- BME 422 Biomedical Imaging
- BME 424L Biomedical Electronics Laboratory or ELE 439L Medical Electronics Systems Laboratory
- BME 431 Biomaterials
- BME 432 Biothermofluids
- BME 440 Bioinformatics
- BME 494 Special Topics in Biomedical Engineering
- COE 410 Embedded Systems: Design and Applications
- ELE 456 Pattern Recognition
- one course from the following list not used as a minor requirement:
  - BME 410 Biomedical Systems Modeling I or CHE 481 Fundamentals of Biomedical Engineering
  - BME 420 Biomedical Electronics I or ELE 432 Medical Instrumentation I
  - BME 430 Biomechanics
- any approved 300-level or 400-level special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Engineering Management

Hazim El-Baz, Coordinator

The engineering management minor provides students the opportunity to learn how to manage major engineering projects. The content of the courses offered in the minor is a unique blend of engineering tools and business management skills.

Students enrolling in the engineering management minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in engineering management must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 12 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (12 credit hours)**

Students must successfully complete the following courses:

- ECO 201 Principles of Microeconomics
- EGM 361 Management for Engineers
- EGM 362 Engineering Project Management
- EGM 364 Engineering Economy (for non-chemical and civil engineering students) or CHE 332 Engineering Economy or CVE 367 Project Estimating, Planning and Control

**Minor Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- ACC 201 Fundamentals of Financial Accounting
- CHE 470 Waste Management and Control in Chemical Engineering
- COE 420 Software Engineering
- CVE 451 Urban Water Infrastructure Management
- CVE 463 Construction Management
- ECO 202 Principles of Macroeconomics
- EGM 494 special topic courses in engineering management
- ELE 360 Probability and Stochastic Processes for Electrical Engineers
- FIN 201 Fundamentals of Financial Management
- INE 311 Quality Engineering
- INE 331 Analysis of Production Systems
- MCE 450 Energy Conservation and Management

## Minor in Environmental and Water Engineering

Md. Maruf Mortula, Coordinator

Environmental and water engineering is an interdisciplinary field that combines principles of chemistry and biology with engineering science to study the engineered approaches to protecting water and environment. Environmental and water engineering can include water supply and sewerage systems, water and wastewater treatment, waste management, water quality in coastal areas and environmental resources management. The main objective of an environmental and water engineer is to learn the skills and technologies needed to protect our water and environmental resources.

Students enrolling in the environmental and water engineering minor should have normally completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in environmental and water engineering must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 12 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (12 credit hours)**

Students must successfully complete the following courses:

- EWE 331 Introduction to Water and Environmental Engineering
- EWE 333 Water Quality and Treatment
- any two courses from the following list:
  - CHE 472 Water and Wastewater Treatment Design
  - CVE 341 Water Resources Engineering
  - CVE 351 Environmental Engineering
  - ENV 252 Environmental Chemistry

**Minor Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- CHE 461 Air Pollution
- CHE 470 Waste Management and Control in Chemical Engineering
- CVE 441 Coastal Engineering
- CVE 446 Geotechnical Dam Engineering
- CVE 451 Urban Water Infrastructure Management
- CVE 452 Water Supply and Sewerage Engineering
- CVE 472 Geographic Information Systems
- ENV 352 Environmental Toxicology
- ENV 353 Soil and Water Chemistry
- ENV 451 Waste Treatment
- MCE 482 Intermediate Fluid Mechanics
- MCE 485 Hydraulics of Pipeline Systems
- MCE 488 Introduction to Computational Fluid Dynamics
- any approved 300-level or 400-level special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Mechatronics Engineering

Mohammad Jaradat, Coordinator

Mechatronics is the synergistic combination of mechanical engineering, electronics and electrical engineering with computer science and control systems engineering. Intelligent machines such as robots contain mechanical, electrical and computer systems working in harmony to achieve higher levels of functionality to serve modern life. For example, autonomous vehicles have evolved beyond a mechanical system with electrical components to an integrated system of electro-mechanical devices, embedded microcontrollers, network communications and intelligent software. To develop these advanced intelligent systems, a new breed of

multidisciplinary engineers is needed who not only has a strong foundation in engineering design, but also feels comfortable working across the traditional engineering disciplines of manufacturing, mechanical, electrical and computer engineering.

Students enrolling in the mechatronics engineering minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

The mechatronics minor is restricted to computer, electrical and mechanical engineering students. Students in other majors interested in this minor should contact the College of Engineering Associate Dean for Undergraduate Affairs to investigate the possibility of pursuing this minor.

Students seeking a minor in mechatronics engineering must successfully complete the following requirements:

- a minimum of 18 credit hours for electrical engineering and computer engineering students, or 20 credit hours for mechanical engineering students, including:
  - 15 credit hours of minor requirements for electrical engineering and computer engineering students; 17 credit hours of minor requirements for mechanical engineering students
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS; a minimum of 10 credit hours out of 20 credit hours
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (15/17 credit hours)**

- Computer engineering students must successfully complete the following requirements:
  - ELE 212 Electric Circuits II
  - ELE 351 Electrical Energy Conversion
  - ELE 353 Control Systems I
  - MCE 223 Mechanics of Materials or MCE 240 Fluid Mechanics
  - MCE 464 Introduction to Robotics
- Electrical engineering students must successfully complete the following requirements:
  - COE 410 Embedded Systems: Design and Applications
  - ELE 476L Instrumentation and Control Systems Laboratory
  - ELE 486 Electric Drives
  - MCE 216L Introduction to Engineering Drawing and Workshop
  - MCE 223 Mechanics of Materials or MCE 240 Fluid Mechanics
  - MCE 236L Solid Modeling
  - MCE 464 Introduction to Robotics
- Mechanical engineering students must successfully complete the following requirements:
  - COE 221 Digital Systems
  - COE 241 Microcontrollers: Programming and Interfacing
  - MCE 410 Control Systems
  - MCE 416 Kinematics and Dynamics of Machinery
  - MCE 466 Introduction to Mechatronics

**Minor Electives (minimum of 3 credit hours)**

Students must successfully complete a minimum of three credit hours in courses selected from the following list and not used as minor requirements:

- COE 431 Industrial Cyber Physical Systems
- ELE 444 Control Systems II
- ELE 486 Electric Drives
- MCE 464 Introduction to Robotics
- MCE 466 Introduction to Mechatronics

## Minor in Renewable Energy

Rached Dhaouadi, Coordinator

Renewable energy is a multidisciplinary area that integrates different fields including electrical engineering and mechanical engineering. The minor provides students with an opportunity to acquire skills that would enhance their preparation for joining the related industry. The renewable energy minor will expose students to solar and wind energy sources and electrical energy conversion.

Students enrolling in the renewable energy minor should have normally completed a minimum of 60 credit hours of course work and be in good academic standing.

Students seeking a minor in renewable energy must successfully complete the following requirements:

- a minimum of 21 credit hours including:
  - 15 credit hours of minor requirements
  - a minimum of six credit hours of minor electives
- a minimum of 12 credit hours of the 21 credit hours required for the minor successfully completed in residence at AUS
- a minimum of 12 credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (15 credit hours)**

Students must successfully complete the following requirements:

- ECO 404 Economics of Environmental and Natural Resources
- ELE 351 Electrical Energy Conversion
- ELE 487 Power Conversion in Renewable Energy Systems
- MCE 241 Thermodynamics I
- MCE 451 Renewable Energy Systems

**Minor Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in courses selected from the following list:

- ELE 481 Power System Protection
- ELE 482 Electric Power Distribution
- ELE 485 Power Electronics
- ELE 486 Electric Drives
- MCE 445 Energy Systems
- MCE 446 Refrigeration and Air Conditioning
- MCE 450 Energy Conservation and Management
- MCE 452 Fuel Cells and Hydrogen Systems
- any approved 400-level special topics courses related to renewable energy. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Minor in Transportation Systems

Ghassan Abu Lebdeh, Coordinator

Transportation is an interdisciplinary field that combines principles of land use, transportation planning, traffic engineering, infrastructure design and operation, transportation economics, human behavior, psychology and engineering science to plan, design, operate, maintain and optimize transportation systems. Transportation systems are powerful means to shaping economies and community life. They enable mobility and accessibility for passengers and goods (freight). Both

mobility and accessibility are realized through specialized modes, infrastructure, vehicles, and operations. The planning, design, construction, operations and maintenance of transportation systems must be approached systematically to ensure they meet societies' goals within the confines of critical issues of viability such as the environment, equity, labor, resource politics, economics and international trade, among others. The objective of a transportation systems minor is to empower students with the principles and means necessary to understand the functionalities of transportation systems and their interactions with surrounding environments as a prelude to sustainably plan, design, operate and maintain those systems.

Students enrolling in the transportation systems minor should have normally completed a minimum of 30 credit hours of course work and be in good academic standing.

Students seeking a minor in transportation systems must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - 9 credit hours of minor requirements for civil engineering students; 12 credits hours for non-civil engineering students
  - a minimum of nine credit hours of minor electives for civil engineering students; a minimum of six credit hours for non-civil engineering students
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the courses at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9/12 credit hours)**

Civil engineering students must successfully complete the three courses specified in the list below for a total of nine credit hours; non-civil engineering students must successfully complete all four courses listed below for a total of 12 credit hours:

- CVE 263 Urban Transportation Planning
- TRS 260 Introduction to Transportation Systems (for non-civil engineering students)
- TRS 360 Transportation Systems Management
- TRS 361 Public Transportation Systems

**Minor Electives (6/9 credit hours)**

Civil engineering students must successfully complete a minimum of nine credit hours in courses selected from the following list; non-civil engineering students must successfully complete a minimum of six credit hours:

- CVE 363 Highway Design
- CVE 456 Traffic Engineering
- CVE 457 Airport Planning and Design
- CVE 472 Geographic Information Systems
- ENV 311 Environmental Modeling
- INE 433 Logistics Engineering
- INE 450 Safety Engineering
- MTH 382 Linear Programming and Optimization
- UPL 201 Introduction to Urban Planning
- UPL 302 Analysis of Spatial Phenomena
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

# School of Business Administration

**Dean**
Narjess Boubakri

**Associate Dean for Undergraduate Programs**
Mohsen Saad

**Associate Dean for Graduate Programs**
Valerie Lindsay

As its mission, the School of Business Administration (SBA) at American University of Sharjah prepares tomorrow's global business leaders and contributes to lifelong learning by offering high-quality educational programs patterned after the American model. The school embraces multicultural diversity and seeks to provide regional and global perspectives through programs focused on building core competencies to serve the needs of students, the business community and society. Backed by a faculty committed to discipline-based, applied and pedagogical scholarship, SBA's programs promote critical thinking, creativity, ethical behavior and social responsibility in the development of management and leadership skills.

Today's business professionals must have competence in many disciplines, an understanding of a variety of relationships, and an ability to analyze evolving business, economic and governmental trends. Regardless of the specialty area, SBA students are trained to become leaders who can organize and motivate people to serve the goals of their organizations. Effectively adapting business practices to emerging conditions, such as the accelerating growth of technology, communications and the globalization of the business world, demands a thorough grasp of current business and economic processes, theory and applications. Through its pedagogy, the School of Business Administration:

- prepares students to identify, analyze and understand the interrelationships among business organizations and governments in the UAE, the Gulf States and throughout the world
- develops individuals who can lead organizations toward economic success with an awareness of social and environmental responsibility in the global marketplace of the 21st century
- prepares students to integrate information resources and technology to enable them to anticipate and manage change
- advances students' knowledge of current issues and practices affecting business organizations, international and domestic institutions, and governments
- develops an awareness of societal and environmental needs and concerns as they relate to ethical, professional and socially responsible business practices

Furthermore, the School of Business Administration provides its students with a solid business education core that emphasizes the following teaching methodologies:

- utilizing the latest American business methods, techniques and technologies to provide cutting-edge business education
- integrating multidisciplinary approaches to teaching and learning, utilizing the latest business and economic theories coupled with real-world business data analysis and presentations
- integrating multimedia and computer-based instruction throughout the foundation business curriculum to assist students in learning the latest techniques in business and management

## AACSB Accreditation

The School of Business Administration is accredited by the Association to Advance Collegiate Schools of Business (AACSB International). AACSB accreditation is an internationally recognized professional designation for business schools and is the hallmark of excellence in business education.

## Degree Programs

SBA offers the following undergraduate degree programs:

- Bachelor of Arts in Economics
- Bachelor of Science in Business Administration (BSBA) with majors in
  - accounting
  - economics
  - finance
  - management
  - management information systems
  - marketing

SBA students enrolled in the BSBA degree program may pursue only one major within the BSBA degree program.

For details on the graduate degree programs, please refer to the *AUS Graduate Catalog*.

## Minor Offerings

SBA offers the following minors:

- accounting
- business administration
- economics
- finance
- management
- management information systems
- marketing
- supply chain management

Details on each minor are provided in the catalog section of the department offering the minor. Details for the business administration minor are provided at the end of the school section.

Minors are open to students from outside SBA and to SBA students pursuing majors in disciplines other than the discipline of the minor. Some minors can be more restrictive. Refer to the section of the minor for more information.

To apply to an SBA minor, students must be in good academic standing and must have successfully completed a minimum of 60 credit hours, except for the Minor in Economics and the Minor in Business Administration which require successful completion of a minimum of 30 credit hours. Interested students must obtain approval from the head of the department housing the minor and request a meeting with an advisor to review the specific requirements of the minor.

## Special Notes

To ensure active and well-supported student participation in its e-learning programs, SBA requires students entering the BSBA degree program to purchase and use laptops specified by the university.

Students taking any course in SBA may be required to use the Texas Instrument BAII Plus calculator or any non-programmable calculator in exams, quizzes or any other form of evaluation. No other calculator models will be allowed. If a student does not have the required model for an evaluation, the student will have to take the evaluation without a calculator.

Additional fees may be charged for certain courses that require supplementary materials or support by the school.

## Bachelor of Science in Business Administration (BSBA)

The Bachelor of Science in Business Administration degree program provides students with a 45-credit hours core curriculum that offers a broad knowledge of business functions while emphasizing their application in a global business environment. Imbedded in this core curriculum is a business internship requirement that provides students with the opportunity to experience the corporate world for the first time, to apply the knowledge gained throughout their business program, and to plot a possible career path.

In addition to the business core, the student must complete a minimum of 24 credit hours in a professional area constituting a major. The major allows each student to obtain in-depth knowledge in accounting, economics, finance, management, management information systems or marketing.

Students must also meet the minimum university requirements in general education courses, the innovation and entrepreneurship requirement, as well as complete a minimum of 15 credit hours in free electives. With an appropriate choice of courses, students can benefit from their free electives to complete a minor.

Students in the BSBA degree program complete a common two-year program in which they are introduced to the foundation courses of each of the six subject areas constituting the major offerings of the degree program, allowing students a more informed decision as they work towards meeting the matriculation requirements of their major of choice (detailed in Choice of Major later in this section of the catalog).

**Program Objectives**

SBA prepares undergraduate students for careers in business and for further education by providing an American-style curriculum that applies global business perspectives to the historical and cultural context of the Gulf Region. The BSBA degree program seeks to:

- provide students the theoretical foundations across business functions
- develop students' understanding of ethical and social responsibility
- foster teamwork, interpersonal communication and leadership skills
- advance students' critical thinking, analytical and problem-solving skills
- ensure proficiency in a chosen business discipline

**Program Outcomes**

Graduates from the BSBA degree program are expected to be able to:

- integrate the basic principles of economics, accounting, finance, management, information systems, marketing and operations in the context of a global economy
- apply concepts and theories of ethics and social responsibility to practical business dilemmas, recognizing the implications of management decisions for the interests of key internal and external stakeholders
- demonstrate competency in teamwork, presentation, writing and leadership skills through participation in group projects requiring industry analysis and using the latest business communication tools
- evaluate business situations and critique managerial decisions using financial statements, statistical tools, and other appropriate methods to organize, analyze and present data
- examine common business scenarios using broad knowledge of a specific business discipline, applying concepts, theories and models appropriate to their fields of study

### Admission to the Program

Admission to the BSBA degree program follows the university's undergraduate admission requirements. Due to the quantitative emphasis of the business program, new students are required to take the business school mathematics placement examination, in addition to the English language placement test.

AUS students transferring into the program must have a minimum cumulative GPA of 2.00 and the permission of the Associate Dean for Undergraduate Programs. Further conditions could apply. For information, please check with the head of the department housing the major.

### Degree Requirements

To qualify for graduation with a Bachelor of Science in Business Administration degree, students must successfully complete the following minimum requirements:

- a minimum of 123 credit hours, including a minimum of 36 credit hours in courses at the 300 level or above, as follows:
  - a minimum of 36 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 45 credit hours of core requirements
  - a minimum of 24 credit hours of major requirements and major electives with a minimum GPA of 2.00
  - an approved internship for a minimum duration of five weeks (200 contact hours)
  - a minimum of 15 credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements, as it applies to their major. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 36 credit hours)**

Students in the BSBA degree program must successfully complete a minimum of 36 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the following requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement
- mathematics requirement: MTH 102 or MTH 103
- statistics requirement: satisfied through QBA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses or 200-level and above English (ENG) courses meeting this requirement, including ENG 204 and ENG 208
- ethical understanding requirement: satisfied through MGT 360
- discipline-specific writing intensive course requirement: satisfied through MGT 406
- oral proficiency requirement: satisfied through MGT 406

- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through QBA 201

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Core Requirements (45 credit hours)**

Students in the BSBA degree program must successfully complete the following business core courses:

- ACC 201 Fundamentals of Financial Accounting
- ACC 202 Fundamentals of Managerial Accounting
- BLW 301 Business Law
- BUS 100 Introduction to Business
- BUS 397 Business Internship (0 credit hours)
- ECO 201 Principles of Microeconomics
- ECO 202 Principles of Macroeconomics
- ENG 225 Writing for Business
- FIN 201 Fundamentals of Financial Management
- MGT 201 Fundamentals of Management
- MGT 360 Business Ethics and Social Responsibility
- MGT 406 Business Policy and Strategy
- MIS 201 Fundamentals of Management Information Systems
- MKT 201 Fundamentals of Marketing
- QBA 201 Quantitative Business Analysis
- SCM 202 Operations Management

*Internship*

Students in the BSBA degree program must successfully complete an internship approved by SBA, for a minimum duration of five weeks (200 contact hours), normally in the summer preceding their senior year. BUS 397 Business Internship fulfills this requirement. For details on internship eligibility and registration, please refer to Internship Registration under Registration and Course Information in the Academic Policies and Regulations section of the catalog.

**Major Requirements and Major Electives (minimum of 24 credit hours)**

A minimum total of 24 credit hours of course work must be successfully completed in one of the following majors: accounting, economics, finance, management, management information systems or marketing. Required and elective courses for each major are listed within the corresponding major sections that follow. Students must successfully complete these courses with a minimum CGPA of 2.00.

**Free Electives (minimum of 15 credit hours)**

BSBA students must successfully complete a minimum of 15 credit hours of free electives, excluding MTH 100.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

## Proposed Sequence of Study

BSBA students complete a common first-year and second-year program, followed by the sequence of study for their chosen major in their third and fourth years.

Students who, based on the results of their placement tests, are required to complete the preparatory writing course (WRI 001) and/or the business mathematics preparatory course (MTH 002) are strongly advised to complete a summer term at the end of their first year of study to get back on track with the proposed sequence of study.

BSBA students are expected to follow the recommended sequence of study for their chosen major. Students who do not follow the recommended sequence of study might require more than four years to complete their program.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Common Two Years*

**FIRST YEAR (30 credit hours)**

| Term | Course # | Course Title | Credit Hours |
|---|---|---|---|
| Fall | ACC 201 | Fundamentals of Financial Accounting | 3 |
| | BUS 100 | Introduction to Business | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | | **Total** | **15** |
| Spring | MGT 201 | Fundamentals of Management | 3 |
| | MIS 201 | Fundamentals of Management Information Systems | 3 |
| | MTH 102 | Mathematics for Business II | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

**SECOND YEAR (30 credit hours)**

| Term | Course # | Course Title | Credit Hours |
|---|---|---|---|
| Fall | ECO 201 | Principles of Microeconomics | 3 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | MKT 201 | Fundamentals of Marketing | 3 |
| | QBA 201 | Quantitative Business Analysis | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | ACC 202 | Fundamentals of Managerial Accounting | 3 |
| | ECO 202 | Principles of Macroeconomics | 3 |
| | FIN 201 | Fundamentals of Financial Management | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | SCM 202 | Operations Management | 3 |
| | | **Total** | **15** |

Students who are placed in WRI 001 and/or MTH 002 are strongly advised to complete a summer term at the end of their first year of study to get back on track with the proposed sequence of study and avoid graduation delays.

## Choice of Major

Prior to starting their major courses, BSBA students must declare their choice of major. A Change of Major Form must be submitted to the Office of the Associate Dean for Undergraduate Programs for approval, by the last day of the 12th week of classes of the semester in which the student will complete 60 credit hours. The approved form must be filed with the Office of the Registrar by the end of the add and drop period of the semester in which it will be effective. Students must meet the following minimum requirements:

- a cumulative GPA of 2.00 or above
- successful completion of at least 60 credit hours at the end of the semester in which the choice of major is declared, with 21 credit hours completed from business core courses. Credit hours may not include preparatory 00X courses or Achievement Academy Bridge Program courses.
- passing of BUS 100
- passing of the 200-level business core course introductory to the intended major. Students with an intended major in economics complete ECO 201 as the introductory 200-level course.

Further conditions could be required by the different departments.

Students are strongly advised to register for 300- and 400-level courses in their SBA major field of study after having completed the above requirements.

## Major in Accounting

This major prepares its graduates for positions in industry, public accounting, government and not-for-profit organizations, as well as for graduate study. It provides students with a foundation in the primary areas of the accounting discipline including cost accounting, financial accounting, accounting information systems, assurance services, federal income taxes and related business areas.

Students are also provided with an opportunity to develop their communication skills, integrate and advance their technological skills, and to use critical thinking to analyze ambiguous situations and provide relevant business alternatives. In addition, the accounting major helps prepare students to obtain professional certifications such as Certified Public Accountant (CPA), Certified Management Accountant (CMA) and Certified Internal Auditor (CIA).

In addition to meeting the common BSBA graduation requirements (detailed earlier under Degree Requirements), students in the accounting major must meet the following requirements. Students must successfully complete courses taken as major requirements and major electives with a minimum CGPA of 2.00.

**Major Requirements (18 credit hours)**

- ACC 301 Intermediate Financial Accounting I
- ACC 302 Intermediate Financial Accounting II
- ACC 303 Cost Accounting
- ACC 305 Income Tax I
- ACC 360 Accounting Information Systems
- ACC 410 Auditing

**Major Electives (minimum of 6 credit hours)**

Students must successfully complete a minimum of six credit hours in 300-level or above ACC courses not listed as major requirements, requiring at a minimum ACC 301 as a prerequisite, and selected in consultation with their advisor.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Accounting Major (third and fourth year)*

**THIRD YEAR (33 credit hours)**

| Term | Course # | Course Title | Credit Hours |
|---|---|---|---|
| Fall | ACC 301 | Intermediate Financial Accounting I | 3 |
| | ACC 303 | Cost Accounting | 3 |
| | ENG 208 | Public Speaking | 3 |
| | MGT 360 | Business Ethics and Social Responsibility | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Spring | ACC 302 | Intermediate Financial Accounting II | 3 |
| | ACC 360 | Accounting Information Systems | 3 |
| | BLW 301 | Business Law | 3 |
| | ENG 225 | Writing for Business | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | BUS 397 | Business Internship | 0 |

**FOURTH YEAR (30 credit hours)**

| Term | Course # | Course Title | Credit Hours |
|---|---|---|---|
| Fall | ACC 305 | Income Tax I | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |
| Spring | ACC 410 | Auditing | 3 |
| | MGT 406 | Business Policy and Strategy | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

## Major in Economics

This major provides students with the theoretical foundation to apply economics to decision making and public policy in businesses and other organizations. From the common core of the intermediate theory courses in micro- and macroeconomics, students can branch out into several application areas in economics (such as international economics, industrial organization, money and banking) or pursue more advanced courses (such as managerial economics, econometrics or the senior economics seminar).

In addition to meeting the common BSBA graduation requirements (detailed earlier under Degree Requirements), students in the economics major must meet the following requirements. Students must successfully complete courses taken as major requirements and major electives with a minimum CGPA of 2.00.

**Major Requirements (15 credit hours)**

- ECO 301 Intermediate Microeconomics
- ECO 302 Intermediate Macroeconomics
- ECO 330 Money and Banking
- ECO 351 Introduction to Econometrics
- ECO 401 Managerial Economics

**Major Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in 300-level or above ECO courses not listed as major requirements and selected in consultation with their advisor.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Economics Major (third and fourth year)*

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ECO 301 | Intermediate Microeconomics | 3 |
| | ECO 330 | Money and Banking | 3 |
| | ENG 208 | Public Speaking | 3 |
| | MGT 360 | Business Ethics and Social Responsibility | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Spring | BLW 301 | Business Law | 3 |
| | ECO 302 | Intermediate Macroeconomics | 3 |
| | ECO 351 | Introduction to Econometrics | 3 |
| | ENG 225 | Writing for Business | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | BUS 397 | Business Internship | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ECO 401 | Managerial Economics | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |
| Spring | MGT 406 | Business Policy and Strategy | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

## Major in Finance

This major offers students an integrative approach to the fields of banking and finance. Students will develop the analytical skills and theoretical framework necessary to analyze and understand the financial and banking sectors. Furthermore, this major provides the essential tools for understanding investments, capital markets, financial management and financial institutions. Students majoring in finance can structure their graduation requirements to obtain the knowledge needed to take the first level of the CFA exam upon graduation. The Department of Finance is an educational partner with the Chartered Financial Analysts (CFA) organization in the US.

In addition to meeting the common BSBA graduation requirements (detailed earlier under Degree Requirements), students in the finance major must meet the following requirements. Students must successfully complete courses taken as major requirements and major electives with a minimum CGPA of 2.00.

**Major Requirements (15 credit hours)**

- FIN 310 Analysis of Financial Statements
- FIN 320 Banking
- FIN 330 Investments
- FIN 401 International Finance
- FIN 450 Case Studies in Corporate Finance

**Major Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected in consultation with their advisor from the following:

- ACC 301 Intermediate Financial Accounting I
- ECO 340 Real Estate Economics or FIN 304 Real Estate Investing
- ECO 351 Introduction to Econometrics
- ECO 452 Economic Forecasting
- MIS 380 Fintech: Introduction to Financial Technology
- MTH 307 Theory of Risk
- any 300-level or above FIN courses not listed as major requirements.
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Finance Major (third and fourth year)*

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 208 | Public Speaking | 3 |
| | FIN 310 | Analysis of Financial Statements | 3 |
| | FIN 330 | Investments | 3 |
| | MGT 360 | Business Ethics and Social Responsibility | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **18** |
| Spring | BLW 301 | Business Law | 3 |
| | ENG 225 | Writing for Business | 3 |
| | FIN 320 | Banking | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | BUS 397 | Business Internship | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | FIN 401 | International Finance | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |
| Spring | FIN 450 | Case Studies in Corporate Finance | 3 |
| | MGT 406 | Business Policy and Strategy | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

## Major in Management

This major is designed to prepare students for positions of leadership and responsibility in modern organizations. Management is approached as a professional career that embodies knowledge and concern for the ethical, human and global aspects of organizations, emphasizing a thorough grounding in a common body of knowledge as the basis for making sound decisions and meeting future challenges. The curriculum explicitly focuses on developing communication, leadership and problem-solving skills. In addition, the internship requirement allows students to develop insight and experience in the real world of business. Equipped with the intellectual tools and practical experience necessary to diagnose and resolve organizational challenges, and with effective communication skills, management students will be ready to excel in a wide variety of business settings.

In addition to meeting the common BSBA graduation requirements (detailed earlier under Degree Requirements), students in the management major must meet the following requirements. Students must successfully complete courses taken as major requirements and major electives with a minimum CGPA of 2.00.

**Major Requirements**
**(15 credit hours)**

- MGT 301 Organizational Behavior
- MGT 302 Managing Human Resources
- MGT 305 International Business
- MGT 380 Project Management
- MGT 403 Entrepreneurship

**Major Electives**
**(minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected in consultation with their advisor from the following:

- any 300-level or above MGT courses not listed as major or core requirements
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Management Major (third and fourth year)*

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 208 | Public Speaking | 3 |
| | MGT 301 | Organizational Behavior | 3 |
| | MGT 302 | Managing Human Resources | 3 |
| | MGT 360 | Business Ethics and Social Responsibility | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **18** |
| Spring | BLW 301 | Business Law | 3 |
| | MGT 305 | International Business | 3 |
| | MGT 380 | Project Management | 3 |
| | ENG 225 | Writing for Business | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | BUS 397 | Business Internship | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MGT 403 | Entrepreneurship | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |
| Spring | MGT 406 | Business Policy and Strategy | 3 |
| | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

## Major in Management Information Systems

Digital technology is becoming increasingly embedded in business processes. In order to lead, make an informed decision and succeed in modern organizations, managers and non-managers alike need to understand electronic networks and data, computer hardware and software, mobile devices and electronic commerce, information systems and application development. The Management Information Systems (MIS) major helps students understand the application of technology in small and medium enterprises, family-owned businesses, multinational corporations, and government entities, to improve organizational performance and develop innovative solutions to business problems.

In addition to meeting the common BSBA graduation requirements (detailed earlier under Degree Requirements), students in the MIS major must meet the following requirements. Students must successfully complete courses taken as major requirements and major electives with a minimum CGPA of 2.00.

**Major Requirements (12 credit hours)**

- MIS 301 Fundamentals of Database Management or CMP 320 Database Systems
- MIS 303 Introduction to Systems Analysis and Design or COE 420 Software Engineering
- MIS 388 Business Analytics
- MIS 405 Information Systems Strategy

**Major Electives (minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in courses selected in consultation with their advisor from the following:

- FIN 375 Trading and Financial Markets
- MGT 315 Enterprise Resource Planning
- MGT 380 Project Management or EGM 362 Engineering Project Management
- MKT 360 Digital Marketing
- SCM 310 Management of the Supply Chain
- UPL 302 Analysis of Spatial Phenomena
- any 300-level or above MIS courses not listed as major requirements
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Management Information Systems Major (third and fourth year)*

**THIRD YEAR (33 credit hours)**

| Term | Course # | Course Title | Credit Hours |
|---|---|---|---|
| Fall | ENG 208 | Public Speaking | 3 |
| | MGT 360 | Business Ethics and Social Responsibility | 3 |
| | MIS 301 or CMP 320 | Fundamentals of Database Management Database Systems | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **18** |
| Spring | BLW 301 | Business Law | 3 |
| | ENG 225 | Writing for Business | 3 |
| | MIS 303 or COE 420 | Introduction to Systems Analysis and Design | 3 |
| | MIS 388 | Business Analytics | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | BUS 497 | Business Practicum | 3 |

**FOURTH YEAR (30 credit hours)**

| Term | Course # | Course Title | Credit Hours |
|---|---|---|---|
| Fall | MJE | Major Elective | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |
| Spring | MGT 406 | Business Policy and Strategy | 3 |
| | MIS 405 | Information Systems Strategy | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

## Major in Marketing

Students in this major study the role of marketing in modern organizations. The role of the marketer as the key connection between the product or service provider and the consumer requires a thorough understanding of marketing research and statistical techniques to make informed decisions about the design and development of marketing strategies. These strategies will encompass product and branding concepts, promotion and communication with customers, pricing and distribution. Additionally, the field of study will stress practical applications of marketing concepts in areas such as consumer behavior, sales management and retailing.

Students are encouraged to custom design their major by choosing from an array of marketing electives.

In addition to meeting the common BSBA graduation requirements (detailed earlier under Degree Requirements), students in the marketing major must meet the following requirements. Students must successfully complete courses taken as major requirements and major electives with a minimum combined GPA of 2.00.

**Major Requirements (15 credit hours)**

- MKT 301 Consumer Behavior
- MKT 302 Marketing Research
- MKT 309 Global Marketing
- MKT 310 Marketing Communications
- MKT 401 Marketing Strategy

**Major Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected in consultation with their advisor from the following:

- MIS 388 Business Analytics
- any 300-level or above MKT courses not listed as major requirements
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Proposed Sequence of Study**
**Bachelor of Science in Business Administration (BSBA)**
*Marketing Major (third and fourth year)*

| THIRD YEAR (33 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ENG 208 | Public Speaking | 3 |
| | MGT 360 | Business Ethics and Social Responsibility | 3 |
| | MKT 301 | Consumer Behavior | 3 |
| | MKT 309 | Global Marketing | 3 |
| | GER-Core | Arts and Literature | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **18** |
| Spring | BLW 301 | Business Law | 3 |
| | ENG 225 | Writing for Business | 3 |
| | MKT 302 | Marketing Research | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | | **Total** | **15** |
| Summer | BUS 397 | Business Internship | 0 |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MKT 310 | Marketing Communications | 3 |
| | MJE | Major Elective | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |
| Spring | MGT 406 | Business Policy and Strategy | 3 |
| | MKT 401 | Marketing Strategy | 3 |
| | MJE | Major Elective | 3 |
| | FRE | Free Elective/Minor | 3 |
| | FRE | Free Elective/Minor | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

# Department of Accounting

Abed Al-Nasser Abdallah, Head

**Faculty**

Yass Alkafaji
Musa Darayseh
Karen Hawa
Ashraf Khallaf
Mohamed Feras Salama
Taisier Zoubi

The Department of Accounting aims to educate and prepare students for successful careers in the field of accounting. Students learn to compile, present, analyze, interpret and apply accounting and financial data in the decision-making process. Students pursuing the accounting major learn specific competencies to work in accounting and management in either the private or public sector.

AUS accounting graduates have the background needed for further study toward the Certified Public Accountant (CPA), Certified Management Accountant (CMA) and Certified Internal Auditor (CIA) professional designations.

The Department of Accounting also offers a Master of Science degree in Accounting. For details, please refer to the *AUS Graduate Catalog*.

## BSBA–Major in Accounting

Faculty members from the Department of Accounting provide instruction in the Bachelor of Science in Business Administration (BSBA) degree program. For more information on the accounting major within the BSBA degree program, please see the previous section on the BSBA degree program.

## Minor in Accounting

This minor provides graduates with a basic background in financial and managerial accounting. It is a complementary field of study for students majoring in finance or MIS. It is also an attractive choice for other students who wish to obtain the accounting background needed in the business world, or to begin graduate study toward a professional designation such as a CPA or CMA.

Students applying to this minor should have successfully completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in accounting must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- ACC 301 Intermediate Financial Accounting I
- ACC 302 Intermediate Financial Accounting II
- ACC 303 Cost Accounting

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- any 300-level or above ACC courses not listed as minor requirements
- FIN 310 Analysis of Financial Statements

Accelerated Master's Program (AMP) students may use a maximum of six credit hours from approved graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

# Department of Economics

Samer Kherfi, Head

**Faculty**

Bassam Abu Al-Foul
Mohammad Arzaghi
Hamid Baghestani
Emin Gahramanov
Khusrav Gaibulloev
Ismail Genc
Ilker Kaya
Ozgur Kaya
Adrian Lopes
Ramon Cobo Reyes
Sanket Roy
Jay Squalli
Dina Tasneem
Hugo Toledo
Ajalavat Viriyavipart
Javed Younas

The Bachelor of Arts (BA) in Economics is designed to give students an in-depth understanding of how individuals acting as consumers, as business managers, as participating citizens within a society and as government agents make decisions. Students who graduate with a BA degree in economics will have the knowledge and analytical skills required to understand and solve complex business and social problems.

Like the BA in economics, the BSBA in economics is designed to provide students with an understanding of how people make choices in all aspects of human activity. The BSBA, however, provides greater focus on the choices people make in a business context. Students with the BSBA major in economics will acquire the analytical tools required to become successful managers of firms or not-for-profit organizations.

## Bachelor of Arts in Economics (BAE)

Economics encompasses a diverse range of fields including international trade, finance, development and growth, urban and regional economics, industrial organization, labor economy, banking and monetary economics, natural resources and environmental economics. All, however, are approached with the same set of analytical tools that characterize the economic way of thinking.

Indeed, the economics discipline is distinguished by a small set of powerful ideas that can be applied to a variety of problems from a wide range of topics. These fundamental ideas are incentives, equilibrium and efficiency. From an observation, economists model a real-world situation and test the model empirically to arrive at the model's implications, and use those implications and make recommendations for policy and institutional reform. While economists do not attempt to establish society's goals, they do examine the consequences of different ways of pursuing them. Economic principles, when applied, can lead to outcomes that benefit all of society.

An economics degree provides students with skills that are valuable for a number of careers in which critical thinking and careful decision making are required. It provides a firm foundation for a career in public policy analysis, banking, finance, market analysis and business management.

The purpose of the Bachelor of Arts in Economics (BAE) degree program is to provide students with strong undergraduate training in the theory and application of economics built upon the foundation of education in the liberal arts and science. The program aims to prepare students for rewarding employment in business and government, nationally or internationally, and, if they choose, for graduate study in business, law, economics and other advanced professional degrees at internationally recognized universities.

These functions of the BAE degree program unite in a single mission: the delivery of an American-standard undergraduate economics degree program offering qualifications that are readily recognized and understood internationally by employers and graduate programs.

The commitment to an American standard is achieved by benchmarking the content of economics courses to peer institutions and remaining current as the discipline evolves. Success requires faculty members who have sound training in the major specializations in economics and who actively pursue research.

**Program Goals**

Economics students learn to think creatively about the economic concerns facing the world today. Students learn to apply a variety of theoretical perspectives to issues of economic efficiency, economic growth, globalization, wealth and poverty, individual freedom, discrimination, cultural values and environmental concerns. The strategic objectives of the BAE degree program are to:

- maintain a high-quality curriculum that remains current as the discipline evolves
- promote value-added research and intellectual contributions
- develop in students a competence in critical thinking, communication and information technology
- develop in students a sense of awareness of the broad applications of economics in everyday life

**Program Outcomes**

The BAE degree program provides a solid knowledge of economic theory and policy to prepare students for diverse career opportunities in public and private sectors and for future studies in economics and related fields. Upon successful completion of the program, economics majors will be able to:

- identify the role of supply and demand in a market economy, the role of prices, and the necessary conditions for market economies to function effectively
- demonstrate a working understanding of the economic role of government, fiscal and monetary policy, and market structures
- identify policy options and assess the likelihood they would improve economic growth and efficiency
- apply economic theory to a range of economic and social issues
- assess the benefits of international trade and globalization
- assess the significance of national and international events on the economy
- conduct an independent research project including literature review, data gathering, and data analysis
- communicate effectively orally and in writing

**Distinctive Features of the Program**

Students pursuing the BAE degree program at AUS learn about contemporary economics and its place within the wider social sphere. Students' understanding of economic principles helps them to analyze economic trends and government responses to them.

Students have the opportunity to develop good analytical and problem-solving skills.

By exploring economic theories that help explain human behavior, AUS students learn to develop their own arguments and to assess their own values regarding the issues discussed in class.

### Admission to the Program

Initial admission to the program follows the university's undergraduate admission requirements.

Formal admission to the program requires meeting the following minimum requirements:

- successful completion of 60 credit hours in undergraduate course work. Credit hours may not include preparatory 00X courses or Achievement Academy/Bridge Program courses
- a minimum CGPA of 2.00
- successful completion of ECO 201 and ECO 202

To be eligible for formal admission consideration, students who meet the above requirements must submit a Change of Major form to the Office of the Associate Dean for Undergraduate Programs by the last day of the 12th week of classes of the semester in which the student will complete 60 credit hours. The approved form must be filed with the Office of the Registrar by the end of the add and drop period of the semester in which it will be effective.

AUS students transferring into the program must have a minimum cumulative GPA of 2.50 and the

permission of the associate dean. Further conditions could apply. For information, please check with the head of the department.

## Degree Requirements

To qualify for graduation with a Bachelor of Arts in Economics degree, students must successfully complete the following minimum requirements:

- a minimum of 120 credit hours, including:
  - a minimum of 36 credit hours of general education requirements
  - the innovation and entrepreneurship requirement: three credit hours
  - 27 credit hours of major requirements with a 2.00 minimum GPA
  - a minimum of 36 credit hours of major electives
  - a minimum of 18 credit hours of free electives
- a minimum CGPA of 2.00

Accelerated Master's Program (AMP) students may use a maximum total of six credit hours from graduate-level courses, successfully completed while in the AMP, towards meeting the major electives and/or free electives requirements. For details on the AMP, please refer to the Accelerated Master's Program section earlier in this catalog.

Graduation residence requirements must be met. For details, refer to Graduation Requirements in the Academic Policies and Regulations section earlier in this catalog.

**General Education Requirements (minimum of 36 credit hours)**

Students in the BAE degree program must successfully complete a minimum of 36 credit hours as follows:

- a minimum of 15 credit hours in courses meeting the following requirements:
  - history and culture of the Arab world requirement: three to six credit hours
  - culture in a critical perspective requirement: three to six credit hours
  - arts and literature requirement: three to six credit hours
  - human interaction and behavior requirement: three to six credit hours
- natural sciences requirement: a minimum of six credit hours in courses meeting this requirement
- mathematics requirement: MTH 102 or MTH 103
- statistics requirement: satisfied through QBA 201
- communication requirement: a minimum of 12 credit hours in 100-level writing (WRI) courses or 200-level and above English (ENG) courses meeting this requirement, including ENG 204 and ENG 208
- ethical understanding requirement: satisfied through ECO 490
- discipline-specific writing intensive course requirement: satisfied through ECO 490
- oral proficiency requirement: satisfied through ECO 490
- information literacy requirement: satisfied through WRI 102 and ENG 204
- computer literacy requirement: satisfied through QBA 201

**Innovation and Entrepreneurship Requirement (3 credit hours)**

Students must successfully complete the following course:

- IEN 301 Innovation and Entrepreneurship Mindset

**Major Requirements (27 credit hours)**

Students must successfully complete the following required courses with a 2.00 minimum GPA:

- ECO 201 Principles of Microeconomics
- ECO 202 Principles of Macroeconomics
- ECO 301 Intermediate Microeconomics
- ECO 302 Intermediate Macroeconomics
- ECO 305 International Trade
- ECO 310 Development Economics
- ECO 351 Introduction to Econometrics
- ECO 490 Senior Project in Economics
- QBA 201 Quantitative Business Analysis

**Major Electives (minimum of 36 credit hours)**

*Economics Courses (minimum of 21 credit hours)*

Students must successfully complete a minimum of 21 credit hours from ECO courses at the 300-level or above not listed under the major requirements.

*Related Courses (minimum of 15 credit hours)*

Students must successfully complete a minimum of 15 credit hours in courses selected from the following fields. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

Students may choose to satisfy part or all of the related courses requirement by completing a minor in one of the related fields listed hereafter. A student pursuing the Bachelor of Arts in Economics may not minor in economics.

- accounting
- anthropology
- computer science
- economics (any course at the 300 level or above)
- finance
- history (any course at the 200 level or above)
- international studies
- management
- management information systems
- marketing
- mathematics (any course other than MTH 100 and MTH 111)
- political science
- psychology
- statistics (any course other than STA 201 or STA 202)
- supply chain management

AMP students may use approved graduate-level courses, successfully completed while in the AMP, towards meeting the major electives requirement. In meeting this requirement, the graduate-level courses must comply with the major electives' distribution described above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

**Free Electives (minimum of 18 credit hours)**

Students must successfully complete a minimum of 12 credit hours of free electives, excluding MTH 100.

AMP students may use graduate-level courses, successfully completed while in the AMP, towards meeting the free electives requirement.

**Proposed Sequence of Study**
**Bachelor of Arts in Economics (BAE)**

| FIRST YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ECO 201 | Principles of Microeconomics | 3 |
| | WRI 101 | Academic Writing I | 3 |
| | GER-Core | History and Culture of the Arab World | 3 |
| | GER-Core | Course Selected from General Education Core Requirements | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |
| Spring | ECO 202 | Principles of Macroeconomics | 3 |
| | MTH 102 | Mathematics for Business II | 3 |
| | QBA 201 | Quantitative Business Analysis | 3 |
| | WRI 102 | Academic Writing II | 3 |
| | GER-SCI | Natural Sciences | 3 |
| | | **Total** | **15** |

| SECOND YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ECO 301 | Intermediate Microeconomics | 3 |
| | ECO 310 | Development Economics | 3 |
| | ENG 204 | Advanced Academic Writing | 3 |
| | GER-Core | Culture in a Critical Perspective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ECO 302 | Intermediate Macroeconomics | 3 |
| | ENG 208 | Public Speaking | 3 |
| | MJE | Economics Course | 3 |
| | MJE | Related Course | 3 |
| | GER-Core | Arts and Literature | 3 |
| | | **Total** | **15** |

| THIRD YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | ECO 305 | International Trade | 3 |
| | ECO 351 | Introduction to Econometrics | 3 |
| | IEN 301 | Innovation and Entrepreneurship Mindset | 3 |
| | MJE | Related Course | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | MJE | Economics Course | 3 |
| | MJE | Economics Course | 3 |
| | MJE | Related Course | 3 |
| | GER-Core | Human Interaction and Behavior | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

| FOURTH YEAR (30 credit hours) | | | |
|---|---|---|---|
| **Term** | **Course #** | **Course Title** | **Credit Hours** |
| Fall | MJE | Economics Course | 3 |
| | MJE | Economics Course | 3 |
| | MJE | Economics Course | 3 |
| | MJE | Related Course | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |
| Spring | ECO 490 | Senior Project in Economics | 3 |
| | MJE | Economics Course | 3 |
| | MJE | Related Course | 3 |
| | FRE | Free Elective | 3 |
| | FRE | Free Elective | 3 |
| | | **Total** | **15** |

Students who do not follow the recommended sequence of study might require more than four years to complete their program.

## BSBA–Major in Economics

Faculty members from the Department of Economics provide instruction in the Bachelor of Science in Business Administration (BSBA) degree program. For more information on the economics major within the BSBA degree program, please see the previous section on the BSBA degree program.

## Minor in Economics

This minor complements the degree program of students in other majors and is designed to help them develop a basic understanding of the principles and applications of economics. By pursuing this minor, students will develop an understanding of microeconomic and macroeconomic principles, the role of markets, and the effects of government regulation and policy on economic behavior.

Students applying to this minor should have successfully completed a minimum of 30 credit hours and be in good academic standing.

Students seeking a minor in economics must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - six credit hours of minor requirements
  - a minimum of 12 credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of nine credit hours of the 12 credit hours at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements**
**(6 credit hours)**

Students must successfully complete the following courses:

- ECO 201 Principles of Microeconomics
- ECO 202 Principles of Macroeconomics

**Minor Electives**
**(minimum of 12 credit hours)**

Students must successfully complete a minimum of 12 credit hours in courses selected from the following:

- FIN 330 Investments
- any 300-level or above ECO courses not listed as minor requirements.

Accelerated Master's Program students (AMP) may use a maximum of six credit hours from approved graduate-level courses, successfully completed while in the AMP, towards meeting the minor electives requirement. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

Students should consult with their advisors when choosing their minor electives.

## Department of Finance

Osamah AlKhazali, Head

**Faculty**

Iness Aguir
Narjess Boubakri
Abdelaziz Chazi
Daniel Dupuis
Kimberley Gleason
Ali Mirzaei
Christian Rauch
Mohsen Saad
Anis Samet
Zaher Zantout

The Department of Finance aims to educate and prepare students for successful careers in the field of finance. Studying finance at AUS provides students with the intellectual tools to succeed in careers in financial management, banking, investments, real estate and other sectors of the global financial world.

The Department of Finance has partnered with the CFA Institute and has incorporated the Chartered Financial Analyst (CFA) Level I curriculum in its course offerings.

The Department of Finance also offers a Master of Science degree in Finance. For details, please refer to the *AUS Graduate Catalog*.

### BSBA–Major in Finance

Faculty members from the Department of Finance provide instruction in the Bachelor of Science in Business Administration (BSBA) degree program. For more information on the finance major within the BSBA degree program, please see the previous section on the BSBA degree program.

### Minor in Finance

This minor provides a basic background in the fields of banking and finance. It is a complementary field of study for students majoring in accounting economics or marketing. It is also an attractive choice for other students who wish to obtain the finance background needed in the business world, or to begin graduate study toward a professional designation such as the CFA.

Students applying to this minor should have successfully completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in finance must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- FIN 310 Analysis of Financial Statements
- FIN 330 Investments
- FIN 450 Case Studies in Corporate Finance

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- ACC 301 Intermediate Financial Accounting I
- ECO 340 Real Estate Economics
  FIN 304 Real Estate Investing
- ECO 351 Introduction to Econometrics
- ECO 452 Economic Forecasting
- MIS 380 Fintech: Introduction to Financial Technology
- MTH 307 Theory of Risk
- any 300-level or above FIN courses not listed as minor requirements
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Department of Management

Patrick McClelland, Head

**Faculty**

Cynthia Baker
Omar Belkhodja
Virginia Bodolica
Tor Brodtkorb
Ahmad El-Assadi
Alaa Hamade
John E. Katsos
Ali Khawaja
Savita Kumra
Valerie Lindsay
Stefania Mariano
Rodrigo Basco Rodriguez
Daniel Simonet
Marie-France Waxin

The Department of Management aims to educate and prepare students for successful careers at the managerial level in the private, public and non-profit sectors. Students learn the leadership and management skills and techniques that are essential to help corporations and organizations achieve their goals and objectives, and the methods used by policy makers to shape and improve communities and people's lives.

The department offers a BSBA major in management. With its balanced emphasis on developing both "hard" and "soft" skills and an appreciation of the challenges posed by cultural diversity and a global marketplace, the courses offered by this department provide a solid foundation for either entry-level managerial positions or graduate study in MBA or business-subject PhD programs.

### BSBA–Major in Management

Faculty members from the Department of Management provide instruction in the Bachelor of Science in Business Administration (BSBA) degree program. For more information on the management major within the BSBA degree program, please see the previous section on the BSBA degree program.

### Minor in Management

This minor is designed for students outside the major in management or outside the School of Business Administration who desire to increase their networking skills, expand their business knowledge, increase their career opportunities, improve their readiness for corporate life and support their candidacy for an MBA or other graduate programs.

Students applying to this minor should have successfully completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in management must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- MGT 301 Organizational Behavior
- MGT 305 International Business
- MGT 403 Entrepreneurship

**Minor Electives**
**(minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- MIS 380 Fintech: Introduction to Financial Technology
- MIS 388 Business Analytics
- any approved 300-level or above MGT courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

## Department of Marketing and Information Systems

M. Sajid Khan, Head

**Faculty**

Norita Ahmad
Jeffrey Baker
Jean Boisvert
Parkash Chathoth
George Christodoulides
Abdelkader Daghfous
Aaron Gazley
Nebojsa Milic
Kichan Nam
Abroon Qazi
Rania Semaan
Xiaobo Xu

The Department of Marketing and Information Systems aims to educate and prepare students for successful business careers at the managerial level in the private and public sectors. Students can tailor their education to prepare for a career in marketing, management information systems and supply chain management. The department offers a BSBA major in management information systems and a BSBA major in marketing.

In the marketing major students learn the marketing skills of developing branding, pricing, promotions and distribution channel strategies which are essential to help organizations achieve their goals and objectives. The field of marketing stresses the practical application of concepts in areas such as consumer behavior, organizational buying behavior, service quality and delivery, electronic marketing, retailing, logistics/supply chain, and international marketing.

In the management information systems (MIS) major, students learn about information and communication technologies, business processes, logistics and scientific principles directed to the design, implementation and management of information systems. The field of MIS stresses the practical application of computer technologies in areas such as business programming, software development, data communications and networking, database management, systems analysis and design, knowledge management and e-business. The knowledge gained in this major enables graduates to harness the power of technology as a source of competitive advantage.

### BSBA–Major in Management Information Systems

Faculty members from the Department of Marketing and Information Systems provide instruction in the Bachelor of Science in Business Administration (BSBA) degree program. For more information on the MIS major within the BSBA degree program, please see the previous section on the BSBA degree program.

### BSBA–Major in Marketing

Faculty members from the Department of Marketing and Information Systems provide instruction in the Bachelor of Science in Business Administration (BSBA) degree program. For more information on the marketing major within the BSBA degree program, please see the previous section on the BSBA degree program.

### Minor in Management Information Systems

The minor in management information systems (MIS) prepares graduates for professional careers that rely on the application of information technology to business processes and managerial decision making. An understanding of the principles of data storage, analysis, communication and networking offers students from a variety of business, technical and social science disciplines the skills necessary to stay in step with rapid changes in the role of IT in the world economy

Students applying to this minor should have successfully completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in MIS must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the 15 credit hours at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements**
**(9 credit hours)**

Students must successfully complete the following courses:

- MIS 201 Fundamentals of Management Information Systems
- MIS 301 Fundamentals of Database Management or
  CMP 320 Database Systems
- MIS 388 Business Analytics

**Minor Electives**
**(minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- MGT 315 Enterprise Resource Planning
- MGT 380 Project Management or EGM 362 Engineering Project Management
- SCM 310 Management of the Supply Chain
- UPL 302 Analysis of Spatial Phenomena
- any 300-level or above MIS courses.

### Minor in Marketing

This minor is designed to provide a student with the basic coverage of key marketing concepts. The minor is intended for students whose major discipline involves interaction with customers in some way. The minor will demonstrate how customer feedback can be used in a variety of disciplines and careers.

Students applying to this minor should have successfully completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in marketing must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements

  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the 15 credit hours at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- MKT 201 Fundamentals of Marketing
- MKT 301 Consumer Behavior
- MKT 401 Marketing Strategy

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- MIS 388 Business Analytics
- any approved 300-level or above MKT courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.
- any approved special topic courses at the 300 level or above. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.

### Minor in Supply Chain Management

The minor in supply chain management (SCM) prepares graduates to pursue careers in the running of a firm's operations to deliver products and services to customers.

The minor focuses on supply chain management skills that develop timely and effective business operations, and enable firms to capitalize on new technologies. In particular, the minor promotes the integration of information technologies that create strong entrepreneurial opportunities for firms.

SCM entails understanding of how manpower, equipment and other resources need to be organized for a firm to be successful. The minor highlights the importance of multinational supply chains and logistics that are critical to the success of the UAE given its location as a worldwide trade hub. The role of quality and service delivery in operations is incorporated into the minor since they are vital to the success of firms competing in a global marketplace.

Students applying to this minor should have successfully completed a minimum of 60 credit hours and be in good academic standing.

Students seeking a minor in supply chain management must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the 15 credit hours at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- SCM 202 Operations Management
- SCM 310 Management of Supply Chain
- SCM 311 Logistics Management

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- ACC 360 Accounting Information Systems
- ECO 401 Managerial Economics
- ECO 452 Economic Forecasting
- FIN 430 Financial Forecasting
- MKT 303 E-Commerce
- MKT 307 B2B Marketing and Negotiations
- any 300-level or above MGT, MIS and/or SCM courses not listed as requirements for the minor

## Other Minors Offered by the School of Business Administration

### Minor in Business Administration

The Minor in Business Administration provides basic, complementary knowledge in the field of business. The minor is also attractive to undergraduate students who intend to pursue graduate studies in business administration, as it supports their candidacy and helps in exempting them from preparatory courses.

Students applying to the business administration minor must have successfully completed 30 credit hours and be in good academic standing.

The minor is not open to BSBA students and to students majoring in design management.

Students who declare a minor in business administration are assigned an academic advisor by the Office of the Associate Dean for Undergraduate Programs.

Students seeking a minor in business administration must successfully complete the following requirements:

- a minimum of 18 credit hours including:
  - nine credit hours of minor requirements
  - a minimum of nine credit hours of minor electives
- a minimum of nine credit hours of the 18 credit hours required for the minor successfully completed in residence at AUS
- a minimum of six credit hours of the nine credit hours at or above the 300 level successfully completed in residence at AUS
- a minimum GPA of 2.00 in courses completed to satisfy the minor

**Minor Requirements (9 credit hours)**

Students must successfully complete the following courses:

- BUS 100 Introduction to Business
- any two 200-level courses from:
  - ACC 201 Fundamentals of Financial Accounting
  - ECO 201 Principles of Microeconomics or ECO 202 Principles of Macroeconomics
  - FIN 201 Fundamentals of Financial Management
  - MGT 201 Fundamentals of Management
  - MIS 201 Fundamentals of Management Information Systems
  - MKT 201 Fundamentals of Marketing
  - SCM 202 Operations Management

**Minor Electives (minimum of 9 credit hours)**

Students must successfully complete a minimum of nine credit hours in courses selected from the following:

- any 300-level or above SBA courses. BAE students are restricted to non-ECO 300-level or above SBA courses.

- any approved special topic courses at the 300 level or above. BAE students are restricted to non-ECO approved special topic courses. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications.


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# College of Architecture, Art and Design

## ARC Architecture

**ARC 201 Architectural Design Studio I (12-0-6).** Addresses fundamentals of making architectural form and space with emphasis on design inquiry, exploration and process. Concentrates on classic instances of form sources in architectural design: function, experience, structure, construction and context. Digital media are integral to the studio. Restricted to students formally admitted to the BArch degree program. Repeatable only once. Prerequisites: DES 112, DES 121, DES 122, DES 132, MTH 003 or MTH 111 or MTH 103, and WRI 101 or WRI 102. Lab/Tech fee rate B applies.

**ARC 202 Architectural Design Studio II (12-0-6).** Continues the content and purpose of ARC 201 with increased emphasis on design development and physical and technical resolution. Digital media are integral to the studio. Repeatable only once. Prerequisite: ARC 201. Lab/Tech fee rate B applies.

**ARC 221 Pre-Modern Architecture and Urban Form (3-0-3).** Covers factors influencing the production of architecture and urban form through the study of select buildings and cities within the context of world history from the ancient world to 1850 CE. Focuses on ways in which theoretical knowledge and practical design principles were applied across cultures. Addresses interrelationships between diverse architectural and urban traditions through comparative analyses of historical buildings and cities. Prerequisite: DES 122.

**ARC 222 Modern Architecture and Urban Form (3-0-3).** Introduces knowledge and design principles fundamental to an understanding of the architecture and urban form from 1850 to 1960. Integrates history and theory focusing on a selection of significant issues proceeding topically rather than chronologically. Considers technological changes and regional influences and contributions, concludes with the debates that gave rise to Postmodern Architecture. Prerequisite: DES 122.

**ARC 225 Islamic Art and Architecture (3-0-3).** Concentrates on common and regional elements of Arab and Islamic material culture. Follows developments from formation of an architectural language to diverse regional expressions in calligraphy, ceramics, metals, carpets and other media of artistic work. Relates stylistic phenomena to underlying spiritual and intellectual intent. Prerequisite: WRI 102.

**ARC 232 Materials and Methods I (3-0-3).** Offers an in-depth review of building materials and their properties as they relate to methods of construction and contemporary construction practices used to prepare sites and to erect the building's basic structure. Covers site preparation, foundations, concrete, steel and timber structures, and masonry work. Discusses the basics of producing construction drawings. Prerequisite: ARC 201 or IDE 201.

**ARC 233 Introductory Techniques in Digital Fabrication (4-0-3).** Introduces the concepts, tools and methods used in digital fabrication practices. Covers the fundamental skills necessary for exploring the role of digital fabrication tools in architecture. Prerequisite: DES 132. Lab/Tech fee rate A applies.

**ARC 237 Introductory Techniques in Material Fabrication (4-0-3).** Introduces the concepts, tools and methods used in material fabrication practices. Explores the relationship between material properties, material processes and design through hands-on fabrication exercises. Prerequisite: DES 131. Lab/Tech fee rate A applies.

**ARC 245 Introduction to Building Construction and Systems (3-0-3).** Provides a general understanding of the process through which a building is put together. Introduces the basics of constructing a building, from site preparation to surface finishing. Covers the main characteristics of plumbing, heating, ventilation, air-conditioning, electric and fire protection systems in buildings. Not open to BArch and BID students. Prerequisite: sophomore I standing.

**ARC 265 Fundamentals of Digital Design (4-0-3).** Introduces the fundamental concepts, tools and methods of digital design. Covers software, file management and output strategies related to 2D drafting, 3D modeling and rendering. Prerequisite: DES 132. Lab/Tech fee rate A applies.

**ARC 271 Introduction to Landscape (3-0-3).** Introduces the fundamental cultural, ecological, spatial and technical aspects of landscape design and construction. Includes a range of scales, from the urban and infrastructural to the tactile and botanical, most relevant to the discipline of architecture. Investigates the environmental and climatic forces that impose pragmatic challenges to site construction and occupation. Emphasizes the cultural and vernacular traditions that influence regional and historical land-use patterns and the spatial integration of interior and exterior inhabitation. Prerequisite: DES 101 or DES 131.

**ARC 273 Principles of Landscape Architecture (3-0-3).** Introduces the interpretation and expression of spatial forms from the unique point of view of landscape architects. Analyzes the work of leading designers in the field of landscape architecture to understand their contribution of new knowledge to the profession. Examines a number of contemporary design issues that help to define the profession, which will be addressed in lecture and lab formats. Prerequisite: ARC 201.

**ARC 281 Architectural Principles (3-0-3).** Provides an overview of the fundamental formal, cultural and environmental issues specific to the discipline of architecture and interior design. Emphasizes two- and three-dimensional composition, organizational strategies, and the basic syntax of spatial configuration. Examines the effect of light, air, weather and orientation on spatial experience in the built environment with a focus on building forms and interiors that incorporate a passive and site-specific response to environmental conditions. Prerequisite/concurrent: ARC 201 or IDE 201.

**ARC 301 Architectural Design Studio III (12-0-6).** Advances the fundamentals of the making of architectural form based on concepts derived from space, structure and building construction. Studio-based projects emphasize design strategies for small, multilevel, infill buildings with conventional, short-span structural systems. Repeatable only once. Prerequisites: ARC 202 or IDE 202, and PHY 104.

**ARC 302 Architectural Design Studio IV (12-0-6).** Includes studio-based projects with emphasis on the tectonics of building structure and envelope. Building case studies and design projects explore a range of material and construction system types including steel, wood, masonry and reinforced concrete. Repeatable only once. Prerequisite: ARC 301.

**ARC 311 Illustration and Rendering (4-0-3).** Covers illustration and rendering techniques that enable students to express their ideas faster with more precise results. Covers freehand color drawing techniques

using markers, color pencils and watercolors. Prerequisite/concurrent: ARC 201 or IDE 201.

**ARC 316 Photography and Visual Representation (4-0-3).** Introduces a broad range of photographic techniques and processes intended to facilitate the representation of architectural concepts. Explores the history, theory and practices related to various techniques. Investigates the roles of narrative and sequence in photography. Experiments with combined, montaged and repeated images. Prerequisite: ARC 201 or VIS 221, or DES 160 and DES 362. Lab/Tech fee rate A applies.

**ARC 322 Global Issues in Architecture (3-0-3).** Examines our emerging understanding of global issues confronting humankind, including population growth, declining reserves of non-renewable resources, etc. Gives an overview of the environmental impact of human communities through history. Prerequisite: ENG 203 or ENG 204.

**ARC 323 Shelter and Settlement in Post-Conflict Societies (3-0-3).** Explores the role of design in improving shelter and settlements inhabited by refugees and internally displaced people affected by forced migration. Examines the complex questions associated with forced migration and addresses the impact of humanitarian initiatives related to the built environment. Analyzes shelter and settlement in post-conflict societies through case studies and focuses on ways of representing data and research findings to a broad audience. Prerequisite: ARC 202 or IDE 202 or MUM 202 or VIS 202 or DES 300 or POL 201.

**ARC 324 History of Landscape Architecture (3-0-3).** Presents an introductory survey of the history of landscape design and the interrelationship of architecture and landscape architecture in various cultures throughout history. Prerequisite: ENG 203 or ENG 204.

**ARC 331 Materials and Methods II (3-0-3).** Offers an in-depth examination of the materials and processes involved in finishing a building. Uses a case study approach to demonstrate the evolution of the building process of the major components that are built following the erection of the building's basic structure. Covers stairs, doors, windows, partitions, ceilings, floors, claddings and joints. Investigates design considerations and construction methods with hands-on experience in producing detailed drawings. Prerequisite: ARC 232.

**ARC 342 Structures for Architects (3-0-3).** Introduces the classification and behavior of structural elements and systems most relevant to the design of architecture. Includes the fundamentals of structural analysis, types and classifications of structural dynamics, properties and performance capacity of the primary building materials, and structural elements. Individual structural components and topics are presented in relation to system types and classifications. Emphasizes the dynamic relationship between components and systems. Covers the structural design process including the collaborative nature of working with a structural consultant in a professional office environment. Prerequisites: ARC 201 or IDE 201, and PHY 104.

**ARC 354 Environmental Energies and Building Form (3-0-3).** Studies the physical phenomena that make climate (rain, humidity, temperature, wind, sun, etc.) influence buildings. Covers heat transfer methods, solar radiation, vapor in air, air leakage and water condensation and wind movement. Studies indoor thermal environment and thermal comfort of building occupants. Discusses examples of how these phenomena are used in building design. Does not meet the natural sciences general education requirement for architecture major. Prerequisite: PHY 100 or PHY 101 or PHY 104.

**ARC 366 Applied Computer-Aided Design (4-0-3).** Introduces two-dimensional drafting and three-dimensional Building Information Modeling (BIM) CAD applications. Identifies components and capabilities of each application. Emphasizes the use of 2D CAD applications in the management of a drafting task to produce quality drawings. Emphasizes the use of BIM applications to assist in design decisions. Prerequisite: ARC 201 or IDE 201. Lab/Tech fee rate A applies.

**ARC 382 Architectural Detailing (3-0-3).** Explores the relationship between the design and production of architectural details and the conceptual underpinnings of a project. Introduces technical drawing, construction drawings and industry standards for graphic and written communication. Emphasizes the role of tectonics and material integration beyond pragmatic applications. Prerequisite: ARC 202.

**ARC 397 Internship in Architecture (0-0-0)**. Requires a minimum of five weeks (normally 200 hours) of approved professional experience. Requires the work undertaken to be documented in a formal report submitted to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: ARC 302 and approval of internship coordinator. Registration fee applies.

**ARC 401-01 Architectural Design Studio V (12-0-6).** Employs advanced design tools to respond to complex architectural projects in a topic or collaborative setting. Allows for disciplinary research and experimentation involving specialized techniques and in-depth investigation beyond the scope of schematic building design. Projects address the discipline of architecture at various scales, ranging from details and full-scale fabrication to urban design. Repeatable only once. Prerequisites: ARC 232 and ARC 302.

**ARC 402 Architectural Design Studio VI (12-0-6).** Comprises a capstone and focuses on the development of a comprehensive building design project integrating building technologies with other non-technical design issues. Addresses data collection, analysis and programming along with a detailed design development of building technology components. Repeatable only once. Prerequisite: ARC 401-01.

**ARC 421 Architectural Theory (3-0-3).** Engages the conceptual basis of the work of specific architects, historical and contemporary architectural historians and theoreticians from the 1960s to the present. Examines schools of thought in architecture with an emphasis on the understanding of both written and visual analysis of built form and design. Prerequisites: ARC 221 or ARC 222, and ENG 203 or ENG 204.

**ARC 424 Evolution of Cities (3-0-3).** Introduces the origin, growth and development of cities throughout the history. Examines the various socioeconomic, historic, political and environmental forces that help explain city form. Explores case studies of sites from ancient times to the present with particular emphasis on cities in Islamic and Middle Eastern cultures. Prerequisite: ENG 203 or ENG 204.

**ARC 433 Advanced Topics in Digital Fabrication (4-0-3).** Explores advanced concepts, tools and methods used in digital fabrication practices. Investigates the relationship between technology and design through the development of advanced skills related to digital fabrication techniques in architecture. Prerequisite: ARC 202 or ARC 233 or IDE 202. Lab/Tech fee rate A applies.

**ARC 437 Advanced Topics in Material Fabrication (4-0-3).** Explores advanced concepts, tools and methods used in material fabrication practices. Investigates the relationship between material properties, material processes and design through hands-on fabrication exercises. Prerequisite: ARC

202 or ARC 237 or IDE 202. Lab/Tech fee rate A applies.

**ARC 451 Environmental Control Systems (3-0-3**). Presents the basic principles for the selection and the design of the main environmental control systems in buildings, including plumbing, heating, ventilation, air conditioning, electric, lighting, and fire suppression and protection systems. Prerequisite/concurrent: ARC 401-01.

**ARC 463 Professional Practice (3-0-3).** (Equivalent to IDE 463). Introduces the professional practice of architecture and interior design. Covers the fundamental knowledge of project management, client and consultant relationships, construction administration and the operations of a design business. Introduces the implications of time, budget and economic parameters in relation to the design process, professional ethics, social and political culture, and business management. Prerequisite: junior standing.

**ARC 465 Advanced Computer-Aided Design (4-0-3).** Concentrates on the specific demands on CAD systems by the architecture and building professions. Applies CAD systems to the different phases of planning: preliminary design, design, construction documents, extraction of volumetric data and transfer to spreadsheet and/or database software, rendering software, post-rendering work in pixel-editing software, technical drawing layout software, etc. Prerequisite: ARC 301 or IDE 301. Lab/Tech fee rate B applies.

**ARC 474 Issues in Contemporary Urban Design (3-0-3**). Examines major concepts, principles and theories of urban design. Reviews the historic development of urban design as a professional field and surveys current urban design issues, trends and practices in both the Western and non-Western/Islamic contexts. Prerequisite/concurrent: ARC 301.

**ARC 498 Studio Abroad (3 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Repeatable only once. Prerequisite: studio specific.

**ARC 501 Architectural Design Studio VII (12-0-6).** Employs advanced design tools to respond to complex architectural projects in a topic or collaborative studio setting. Focuses on research, experimentation, and/or specialized techniques leading to solutions that address issues of program, context, building technology and/or fabrication. Addresses the discipline of architecture at various scales ranging from conceptual investigations to full-scale fabrication and urban design. Repeatable only once. Prerequisite: ARC 402.

**ARC 502 Architectural Design Studio VIII (12-0-6).** Continues the employment of advanced design tools to respond to complex architectural projects in a topic or collaborative studio setting. Employs research, experimentation and/or specialized techniques leading to solutions that address issues of program, context, building technology and/or fabrication. Addresses the discipline of architecture at various scales ranging from conceptual investigations to full-scale fabrication and urban design. Repeatable only once. Prerequisite: ARC 501.

**ARC 561 Construction Management (3-0-3).** Studies in-depth the interrelationships among the various professional disciplines in the building and construction industry as they pertain to issues of management and planning of complex construction projects. Reviews standard practices of tendering, contracting, quantity surveying, cost estimation, supervision, quality control and economy. Prerequisite: ARC 301 or IDE 301.

**ARC 581 Critical Practice and Contemporary Discourse (3-0-3).** Examines the role and application of research methodology and critical thinking in the work of leading practitioners and academics. Investigates a current topic in contemporary discourse with a focus on the articulate application of theory and research in architectural production. Foregrounds the history of ideas that frame and influence contemporary trends in the discipline. Focuses on applying critical thinking skills to the analysis and production of architecture as a mode of inquiry. Prerequisite/concurrent: ARC 401-01.

**ARC 591 Directed Architectural Design Research (3-0-3).** Focuses on the development of an architectural design research project under the guidance of a faculty advisor. Prerequisite: consent of the department.

**ARC 592 Directed Architectural Design Studio (12-0-6).** Focuses on the resolution of an independent architectural design project developed under the guidance of a faculty advisor and presented and defended in a formal public critique. May substitute for ARC 502. Repeatable only once. Prerequisite: consent of the department.

## ART Art and Art History

**ART 101 Survey of Art (3-0-3).** Explores art's contribution to Western civilization. Introduces personalities, ideas and the cultural context that established major styles in painting, sculpture and architecture. The first part of this two-course sequence covers the time span from Prehistory to the Middle Ages. Not open to students who have completed DES 121. Prerequisite/concurrent: WRI 101.

**ART 111 Freehand Drawing (4-0-3).** Introduces the basic drawing skills required for freehand drawing and includes freehand perspective, projection systems and design visualization. Not open to CAAD students and to students who have completed DES 111.

**ART 203 Da Vinci and the Age of Discovery (3-0-3).** Explores the context, themes and personalities that shaped the shift from the Middle Ages to the Renaissance. Traces the role of Christianity and Islam in shaping medieval faith and art. Investigates classical humanism, Leonardo da Vinci, Michelangelo, the Reformation and the impact of scientific and geographic discovery. Prerequisite: WRI 102.

**ART 211 Intermediate Drawing (4-0-3).** Explores drawing approaches, attitudes, processes and materials as a means of personal visual exploration and expression. Focuses on current drawing practices through gallery visits, critiques and lectures on materials and methods. Prerequisites: ART 111 or DES 111, and WRI 102. Lab/Tech fee rate A applies.

**ART 241 Introductory Painting (6-0-3).** Introduces the fundamentals and principles of observational painting. Explores various representational strategies, methods, materials and techniques with exercises and assignments designed to develop skills needed to communicate visual information in a painterly context. Prerequisite: ART 111 or DES 111.

**ART 242 Painting: The Practice of Color (6-0-3).** Introduces the basic theories of color and paint application. Covers materials, methods, processes, techniques and the critical skills required to structure form and content into the visual language of painting. Prerequisite: ART 111 or DES 111.

**ART 280 Introduction to Pottery (4-0-3).** Introduces traditional techniques and production processes using clay. Explores the concept and application of centering and form making using the potter's wheel with a variety of conventional hand-building methods including pinching, slabs, coils

and hybrids. Emphasizes a reliance on tools in the manipulation of material. Prerequisites: DES 101 or DES 131, and sophomore standing. Lab/Tech fee rate B applies.

**ART 361 Michelangelo: Painter, Sculptor, Architect (3-0-3).** Studies the art and architecture of Michelangelo and his contributions to Renaissance culture. Examines Michelangelo's role in shaping the social status of the artist in Renaissance Florence and Rome. Explores Michelangelo's relationships with popes, kings and rival artists, and examines his contribution to the development of mannerism in painting and architecture. Assesses Michelangelo's relevance to contemporary discourse. Prerequisites: ART 101 or DES 121 or DES 122, and ENG 203 or ENG 204.

**ART 362 Bernini: Architect, Sculptor, Designer (3-0-3).** Covers the architecture, sculpture and urban design of Gianlorenzo Bernini and his innovative contributions to Italian Baroque culture. Examines his role in achieving unity of the visual arts. Assesses Bernini's part in shaping the face of the Rome we know today. Appraises Bernini's cooperation and competition with other architects of the period and compares urban spaces of the Baroque to contemporary examples. Prerequisites: DES 121 or DES 122, and ENG 203 or ENG 204.

## DES Design

**DES 101 Design Foundations for Non-Majors (6-0-3).** Introduces knowledge, skills and theories comprising design. Focuses on the learning process as a designer. Explores a variety of tools, media and design strategies through ideation, design process, design communication and presentation as an experience of generating designed artifacts. Includes workshops and demonstrations in the studio, the materials lab and the computer lab. Not open to CAAD students and to students who have completed DES 131.

**DES 111 Descriptive Drawing I (6-0-3).** Introduces the principles and practice of observational drawing. Explores various representational approaches. Encourages the development of skills needed to effectively communicate visual information. Explores a range of materials and tools. Restricted to CAAD students. Not open to students who have completed ART 111. Not repeatable.

**DES 112 Descriptive Drawing II (6-0-3).** Introduces the principles of analytical drawing. Emphasizes the development of a critical approach to representing form, space and scale using a range of techniques, tools and materials. Covers various projective and perspective systems. Restricted to CAAD students. Not repeatable.

**DES 121 Introduction to Architecture, Art and Design History (3-0-3)**. Explores a global approach to art, architecture and design. Investigates the technological, religious and social forces that helped to reveal the universality of the human impulse to design. Examines ideas, techniques and design methods thematically within a chronological framework covering the time span from the Stone Age to the Industrial Revolution.

**DES 122 Modern Developments in Architecture, Art and Design (3-0-3)**. Explores the developments in architectural thinking and in all aspects of design during the modern era. Investigates thematically the evolution of ideas and processes that shaped contemporary movements in architecture and design. Discusses contemporary concerns, forms, ideas and attitudes of 20th and 21st century design and architecture.

**DES 131 Design Foundations I (6-0-3).** Introduces the principles and methods of design. Examines composition and visual order. Explores graphic and material methods of representation needed to experiment with concepts of shape, form and space. Includes the development of a visual and verbal design vocabulary. Introduces craft and making skills with a variety of materials and tools. Restricted to CAAD students. Not repeatable.

**DES 132 Design Foundations II (6-0-3).** Introduces the principles and methods of design, with an emphasis on process and conceptual development. Explores organizational systems, space and form in the creation of two-and three-dimensional design concepts. Explores craft and making skills with a variety of materials and tools. Restricted to CAAD students. Not repeatable. Prerequisite: DES 131.

**DES 160 Introduction to Photography (3-0-3).** Provides a hands-on introduction to photographic practice. Covers camera control, film processing and printing in a photography darkroom as well as the basics of digital applications. Introduces photographic language and considerations through the study of examples taken from the history of photography. Not open to BArch, BID, BSMD and BSVC students. Lab/Tech fee rate A applies.

**DES 170 Introduction to Product Design (4-0-3).** Surveys the contemporary and historical developments in product design. Develops an understanding of the roles of the product designer and introduces fundamental environmental, cultural and economic issues relevant to the design of products. Introduces the scope and range of product design, including an awareness of product system service design. Explores various stages and processes of product design including design research, concept generation, scenario building, market evaluations, design development and production. Employs case studies, written and verbal presentations, and introduces basic skills through the development of small-scale exercises. Prerequisite: DES 101 or DES 131. Lab/Tech fee rate B applies.

**DES 200 Communication Design (6-0-3).** Introduces the materials and techniques most commonly used by designers in the field of communication and stresses the development of skill in these areas through the completion of class assignments and projects representative of the concepts discussed in class. Students develop a deeper understanding of visual communication and become well versed in the capacities and restrictions inherent in the materials and techniques most commonly used by professional designers. Not open to BSMD and BSVC students. Prerequisite: DES 131 or MCM 100 or NGN 110 or BIS 101 or STA 201 or STA 202. Lab/Tech fee rate A applies.

**DES 221 Printing and Reproduction Methods in Design (4-0-3).** Introduces basic concepts and methods of reproduction in common use in the design profession and in manufacturing. Introduces planographic methods such as lithography and offset; relief methods such as raised surface printing, embossing and stamping; and stencil methods such as screen printing and media blasting. Addresses methods of reproducing information on a variety of surfaces using traditional and digital techniques. Examines traditional and experimental applications in two- and three-dimensional work across a range of disciplines. Prerequisite: ART 111 or DES 101 or DES 111. Lab/Tech fee rate B applies.

**DES 230 Digital Media in Communication Design (4-0-3).** Builds on the development and skills associated with digital design. Helps students gain a more complete understanding of how digital media is used in electronic design, through working with the latest in industry-specific hardware and software, and learn the capabilities available to communication designers. Emphasizes

the creation, preparation and presentation of finished digital media projects. Not open to BSMD and BSVC students. Prerequisite: DES 131 or BIS 101 or MCM 100 or NGN 110 or STA 201 or STA 202. Lab/Tech fee rate A applies.

**DES 231 History of Design (3-0-3).** Explores topics in the history of design and visual communication. Introduces recognized schools of design philosophy and/or practice. Explores the relationship between design and culture. Prerequisites/concurrent: WRI 102 and sophomore standing.

**DES 232 Research Methodologies for Design (3-0-3).** Introduces research processes within design practice and theory. Explores diverse research methods and strategies that inform design decisions while improving process, efficiency and time management. Addresses research demands implicit to design disciplines through readings, discussions and practical assignments. Prerequisites: DES 101 or DES 131, and ENG 203 or ENG 204.

**DES 270 Design as Form (6-0-3).** Develops skills in three-dimensional design and form making. Explores relationships of form, perception and visual/sensory phenomenon with specific focus on the application of design principles to the creation of small-scaled objects through methods of modeling and development. Prerequisites: DES 101 or DES 131, and sophomore standing. Lab/Tech fee rate A applies.

**DES 275 Fundamentals of Design Management (3-0-3).** Introduces the fundamentals of design management. Includes the implementation of design management at the corporate, process and project level in corporative, medium and small-sized enterprises. Stresses skills required in different organizations in the global economy. Prerequisite/concurrent: DES 231.

**DES 300 Design Project (6-0-3).** Further develops a practical understanding of designing for a purpose. Requires students to define a project that concludes with a presentation to a virtual client and an evaluation of the success of the project. Not open to BSMD and BSVC students. Prerequisite: DES 200.

**DES 320 Introduction to Web Design (6-0-3).** Introduces website design. Students learn to use a variety of graphic design and web page authoring tools, and Internet technologies and other relevant issues are discussed. Students are expected to learn and use software packages for developing real-life web pages. Not open to BSMD and BSVC students. Lab/Tech fee rate A applies.

**DES 331 Entrepreneurship for Design (3-0-3).** Examines key concepts of entrepreneurship. Provides an understanding of the entrepreneurial opportunity and of the entrepreneurial process. Covers viability screening to ascertain whether the new venture to the point of investor readiness, gain intellectual property protection, and design the business model for the new venture. Prerequisite: ENG 203 or ENG 204.

**DES 332 Design Games for Collaboration (3-0-3).** Explores the role of games in facilitating collaboration among cross-disciplinary groups engaged in product, service and business innovation. Introduces a "thinking-by-hands'" methodology, which enhances the ability of multiple stakeholders to negotiate the design process and participate in concept design activities. Prerequisites: Junior I standing, and ENG 203 or ENG 204.

**DES 340 Materials and Processes for Design (4-0-3).** Covers a variety of techniques, materials and processes specific to the fabrication of three-dimensional models and small-scaled forms. Introduces both traditional and digital tools and develops safe working practices. Examines the relationship between the use of digital technology and traditional methods of fabrication. Explores the creative potential of materials and construction methodologies and emphasizes the iterative investigation of form and structure with the integration of multiple design principles. Develops student's skills in producing three-dimensional forms with a high degree of craftsmanship. Prerequisite/concurrent: ARC 202 or DES 270 or IDE 202 or MUM 202 or VIS 202. Lab/Tech fee rate B applies.

**DES 360 Critical Discourse in Design (3-0-3).** Examines the relationship between design intention and interpretation. Reviews the application of graphic language in visual media. Requires research on topics related to design communication. Complements studio-based design courses by exploring design considerations and practice from a theoretical perspective. Prerequisite: DES 231.

**DES 362 History of Photography: The Portrait (3-0-3).** Explores the history of photography as evidenced in the development of the photographic portrait. Covers examples of early photographic practice; the commercialism of photography; and documentary, fine art and contemporary approaches to the photographic portrait genre. Prerequisite: ENG 203 or ENG 204.

**DES 363 Principles of Museum and Gallery Management (3-0-3).** Introduces the history, purpose and organization of museums. Explores contemporary museum and gallery practices, topics include: the museum and its mission, exhibition development and design, marketing and audience development, organization and financial management as well as the social, economic and political trends that shape museums. Introduces the various aspects of professional work in both museums and galleries. Prerequisite: ENG 203 or ENG 204.

**DES 370 Introduction to Prototyping (6-0-3).** Examines the conceptual and technical skills that represent evolutionary steps in design process and production. Covers the use of hand drawing, digital rendering and fabrication techniques to develop ideas. Addresses concept generation skills, including ideation drawing and rapid prototyping activities. Focuses on the visual and verbal communication skills necessary for the projection and promotion of ideas and products. Prerequisite: ARC 201 or DES 230 or DES 270 or IDE 201 or MUM 201 or VIS 201, or DES 101 and MCE 236L. Lab/Tech fee rate B applies.

**DES 374 Package Design (4-0-3).** Introduces principles of package design. Focuses on the integration and application of graphic and visual elements to three-dimensional objects through folding, creasing and simple die cutting. Examines packaging trends in the context of the needs of the region to develop economical, responsible and sustainable solutions. Covers environmental and social issues related to packaging. Prerequisite: DES 101 or DES 131. Lab/Tech fee rate A applies.

**DES 380 Innovation and Strategy (4-0-3).** Introduces the management of innovation with an emphasis on product/service innovation. Identifies important trends in innovation and explores their implications for innovation management. Includes various sources, types and patterns of innovation, as well as the role of standards, the timing of market entry and their influence in shaping innovation strategy. Prerequisite/concurrent: DES 300.

**DES 397 Internship in Design Management (0-0-0).** Requires a minimum of five weeks (normally 200 hours) of approved professional experience. Requires the work undertaken to be documented in a formal report submitted to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and

approval of internship coordinator. Registration fee applies.

**DES 462 Design Management (3-0-3).** Introduces the principles and practices of the economic and commercial aspects of design practice in a global economy. Includes microeconomics theory as it applies to private enterprise: basic business economics, planning and management. Gives attention to the processes and skills required in establishing an independent design office. Prerequisite/concurrent: DES 300.

**DES 471 Managing the Design Process (3-0-3).** Introduces theoretical aspects of project organization. Involves research and planning an event and exhibition. Offers the opportunity to study the design process and what is necessary within a group to make a large, multifaceted project happen. Includes the following topics: division of responsibilities, utilizing timelines and developing presentation skills. Prerequisite: DES 300.

**DES 475 Service Design (4-0-3).** Introduces the core activities of service design including the planning and organizing of people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between service providers and customers. Emphasizes tools, techniques and methods of service design. Prerequisite/concurrent: DES 380.

**DES 480 Design Thinking (6-0-3).** Addresses design thinking as a methodology of innovation based on a deep understanding of what people want and need. Focuses on the six components of design thinking derived from the cognitive strategies and methodologies of creative design practice and explores their potential in resolving complex urban, social and business problems. Prerequisite/concurrent: DES 475.

**DES 497 Design Practicum (6-0-3).** Focuses on the development and advancement of knowledge and skills required to deliver professional design services. Addresses the roles that collaboration and client demands play in design practice. Provides the opportunity to synthesize theory and practice in real-world projects. Repeatable up to 6 credits. Prerequisite/concurrent: DES 300 or ARC 202 or IDE 202 or MUM 202 or VIS 202.

**DES 498 Studio Abroad (3 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Repeatable only once. Prerequisite: studio specific.

## FLM Film

**FLM 100 The Art of Film (4-0-3).** Introduces the central issues of film aesthetics, including formal and stylistic elements: color, lighting, editing, sound, movement, mise-en-scene, etc. Develops analytical and interpretive skills by providing critical tools required for discussing and writing about film as well as examining relationships between a film and its technological and cultural impact on society. Subjects are treated topically rather than historically, and emphasis is placed on mastering key concepts of film grammar and art. Prerequisite/concurrent: WRI 102.

**FLM 206 Cities and Cinema (4-0-3).** Explores the role cities play in movies, and how images of cities and urban life are constructed in cinema. Considers the ways cities are portrayed as both real and imagined backdrops to film narratives. Studies the visual means by which movies, through lighting, photography, special effects and editing, mediate and condition our perception and understanding of the city. Considers the reasons why filmmakers choose to depict cities and the urban environment in the ways that they do. Prerequisites: WRI 102, and DES 101 or DES 121 or DES 122.

**FLM 210 Narrative Structure in Film (4-0-3).** Introduces the development of narrative sequential imagery required to communicate an idea or story line, focusing on developing distinctive narrative image-making skills. Projects emphasize idea generation, story concept/structure, storyboards and narrative writing for film. Examines narrative structure in relation to the languages of design, cinema and interactive story. Prerequisites: FLM 100, and ENG 203 or ENG 204. Lab/Tech fee rate A applies.

**FLM 310 Film Production I (4-0-3).** Introduces the process, development, production and post-production of narrative film projects. Provides practical experience including production planning, pre-visualization, storyboarding and location production. Screenings of significant films provide a critical context for the production process. Prerequisite: FLM 210 or MUM 201 or MCM 277. Lab/Tech fee rate B applies.

**FLM 312 Film Production II (4-0-3).** Continuation of FLM 310. Includes project-based studies in film development, production and non-linear computer-based post-production. Screenings of significant films provide a technical and critical context for the production process. Prerequisite: FLM 310. Lab/Tech fee rate B applies.

**FLM 332 Experimental Film and Video I (4-0-3).** Examines basic to intermediate concepts as they relate to the aesthetics of short non-narrative format. All three stages of production are represented through series of practical projects that enable students to investigate the relationship between image and sound as they relate to overall aesthetic value. Different approaches are examined through screening of case studies focusing on style conventions. Prerequisite: DES 230 or FLM 100 or MUM 201 or VIS 201. Lab/Tech fee rate A applies.

**FLM 360 Screenwriting (3-0-3).** Focuses on the craft of writing for film and television. Covers research methods, interviewing techniques, subject treatment, dialogue writing and the development of basic script formats. Explores the process of transforming story ideas into film or television scripts. Prerequisites: FLM 100, and ENG 203 or ENG 204.

**FLM 401 Significant Film Genres (4-0-3).** Serves as the capstone course in film criticism with a particular focus on themes and/or eras in film. Topics covered may include, but are not limited to, the following: films of the 1950s, screwball comedy, musicals, detective, western films, and film noir in cultural context. Specific focus shown by subtitle. Prerequisites: FLM 100, and ENG 203 or ENG 204.

**FLM 410 Advanced Film Production (4-0-3).** Offers advanced studies in film development, production and non-linear computer-based post-production for third-and fourth-year students. Screenings of significant films provide a technical and critical context for the production process. Prerequisite: FLM 310. Lab/Tech fee rate B applies.

**FLM 412 Documentary Film Production (4-0-3).** Focuses on the fundamentals of documentary film production. Covers research methods, interviewing techniques, production and editing, as well as studying documentary works that exemplify the theory and practice of this genre. Prerequisite: FLM 310 or MCM 281. Lab/Tech fee rate B applies.

## IDE Interior Design

**IDE 201 Interior Design Studio I (12-0-6).** Investigates the fundamentals of interior space with a focus on design inquiry, process and representation. Introduces components

that shape interior space and analyzes their relationships with a given context. Develops the basic skills of spatial organization by addressing issues of size, scale, hierarchy, distribution and circulation. Introduces software applications and graphic techniques integral to the development and presentation of studio projects. Restricted to students formally admitted to the BID program. Repeatable only once. Prerequisites: DES 112, DES 121, DES 122, DES 132, and MTH 001 or MTH 003 or MTH 103 or MTH 111, and WRI 101. Lab/Tech fee rate B applies.

**IDE 202 Interior Design Studio II (12-0-6).** Continues the investigation of the IDE 201 studio content with additional emphasis on the application of natural and artificial light, colors and materials. Technical resolutions and anthropometric requirements in the context of space making are broadly investigated. Further develops the use of software applications and graphic techniques integral to the development and presentation of studio projects. Repeatable only once. Prerequisite: IDE 201. Lab/Tech fee rate B applies.

**IDE 225 History and Theory of Interior Design: Global and Regional Issues (3-0-3).** Examines the historical and social movements that established the foundation for the contemporary practice of interior design. Reviews historical origins of design in the Middle East and its influence in Eastern civilization from the 18th century onwards. Emphasizes design history from the industrial revolution to the present, with an in-depth revision from the avant-garde artistic and aesthetic streams of the 20th century to the most important contemporary designs. Prerequisites: DES 101 or DES 131, and WRI 101.

**IDE 239 Interior Materials and Methods (3-0-3).** Introduces interior architectural finish and construction materials, available products, performance characteristics, technical attributes and considerations, and methods of application. Explores basic structural systems, interior finish materials and applications, technical evaluation methods, detail documentation and specification requirements using standard construction methodology. Prerequisites: DES 101 or DES 131, and WRI 101.

**IDE 251 Color and Light (4-0-3).** Introduces the fundamentals, principles and art of lighting and color, and their visual and physical effects in interior design. Explores light and color as important elements in interior space through the study of related perceptual and physical factors. Introduces relevant terminology to define light and color as attributes of architectural and interior space, including illumination levels, color temperatures, light sources and light fixtures. Prerequisites: DES 101 or DES 131, and WRI 101.

**IDE 301 Interior Design Studio III (12-0-6).** Focuses on advanced spatial concepts relevant to contemporary practices in the field. Investigates the role of precedents and analogue spaces in generating conceptual ideas. Examines the expressive potential of interior elements (floor, wall, stairs, openings, etc.) and materials. Develops an understanding of the relationship between interior elements, materials and the architectural shell. Explores various design scales with a specific focus on how resolved technical details can express formal ideas. Repeatable only once. Prerequisites: IDE 202 or ARC 202, and PHY 104.

**IDE 302 Interior Design Studio IV (12-0-6).** Continues the intent and purpose of IDE 301. Emphasizes the development of programming strategies within a defined cultural context. Concentrates on the phenomenological aspects of interior environments and explores the spatial and perceptual implications of artificial lighting and materials. Explores the conceptual and spatial implications of furniture layout, selection and design. Repeatable only once. Prerequisite: IDE 301.

**IDE 334 Furniture and Furnishings (4-0-3).** Addresses furniture designers, typologies, principles of anthropometrics and ergonomics related to work processes/seating and the human body, materiality, construction and fabrication/production technologies. Explores the form, function, aesthetics and cultural influences through lectures, class discussions, case studies and various media. Culminates in assignments, presentations, and research, and the development of scale models of furniture design projects. Prerequisites: DES 132, and ENG 203 or ENG 204.

**IDE 335 Furniture Design Basics (4-0-3).** Explores the basic function and design of furniture as it relates to human factors, such as anthropometrics and ergonomics. Provides a link between historical, theoretical and practical experience. Defines the elements of form, function and aesthetic by exploring experimental concepts and adopting alternative ways of thinking about the objects that surround us. Applies furniture models built to scale, or other presentation techniques, to effectively support the evolution of new concepts. Prerequisite/concurrent: IDE 201 or ARC 201.

**IDE 352 Environmental Control Systems in Interior Design (2-3-3).** Provides an integrated presentation of environmental control systems (lighting, heating, ventilating, air conditioning, sanitary and acoustics) with special attention to the needs of interior designers. Presents systems as they influence one another and as they constrain interior space planning and design. Prerequisite: PHY 104; prerequisite/concurrent: IDE 201 or ARC 201.

**IDE 397 Internship in Interior Design (0-0-0).** Requires a minimum of five weeks (normally 200 hours) of approved professional experience. Requires the work undertaken to be documented in a formal report submitted to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator. Registration fee applies.

**IDE 401 Interior Design Studio V (12-0-6).** Addresses a large-scale interior design project within a specific cultural context. Integrates advanced topics with conventional design development strategies. Addresses issues of sustainability, life safety, accessibility, human behavior and spatial experience. Repeatable only once. Prerequisite: IDE 302.

**IDE 402 Interior Design Studio VI (12-0-6).** Explores a comprehensive large-scale interior design project with an emphasis on the production of a full set of construction drawings and specifications, including an understanding of building systems, code compliance, sustainability and health, safety and welfare (HSW). Repeatable only once. Prerequisite: IDE 401.

**IDE 434 Construction, Detailing and Structures (4-0-3).** Builds upon IDE 239 Materials and Methods, examining interior structures and construction. Addresses the content, vocabulary and process involved in design, detailing and fabrication of interior spaces. Emphasizes the development of technical drawings and language to effectively communicate with allied design practitioners. Prerequisite: IDE 239 or ARC 232.

**IDE 460 Exhibition Design (4-0-3).** Equips students with the essential research, planning and design tools to conceive, prepare and produce persuasive exhibition and educational environments such as product shows, museums and gallery interiors. Explores issues of planning, lighting, stagecraft, narrative composition and human perception. Prerequisite: IDE 202 or ARC 202.

**IDE 463 Professional Practice (3-0-3).** (Equivalent to ARC 463). Introduces the professional practice of architecture and interior design. Covers the fundamental knowledge of project management, client and consultant relationships, construction administration and the operations of a design business. Introduces the implications of time, budget and economic parameters in relation to the design process, professional ethics, social and political culture, and business management. Prerequisite: junior standing.

**IDE 498 Studio Abroad (3 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Repeatable only once. Prerequisites: IDE 302 or ARC 302, and consent of department.

## MUM Multimedia Design

**MUM 201 Multimedia Design Studio I (6-0-3).** Introduces fundamental skills in the creation of digital sound and image content. Explores the interrelationship of image, text and sound through formal investigations and basic narrative sequencing. Restricted to students formally admitted to the BSMD degree program. Repeatable only once. Prerequisites: DES 112, DES 121, DES 122, DES 132, MTH XXX and WRI 101. Lab/Tech fee rate A applies.

**MUM 202 Multimedia Design Studio II (6-0-3).** Introduces the principles of interaction design by analyzing and creating objects, interfaces and patterns. Emphasizes the creation of functional prototypes using industry standard practices. Repeatable only once. Prerequisite: MUM 201. Lab/Tech fee rate A applies.

**MUM 221 Motion Graphics and Video (4-0-3).** Introduces compositing strategies using video, sound and image content. Provides historical overview and conceptual context through case studies and screenings of significant work. Prerequisite: MUM 201. Lab/Tech fee rate A applies.

**MUM 301-01 Multimedia Design Studio III (6-0-3).** Explores sequential narrative design in linear and interactive media. Emphasizes analysis and deconstruction of significant narrative structures in relationship to form, content and meaning. Repeatable only once. Prerequisite: MUM 202.

**MUM 302-01 Multimedia Design Studio IV (6-0-3).** Examines user experience design through the integration of research, prototyping, content creation and media delivery. Emphasizes the development and presentation of functioning prototypes. Repeatable only once. Prerequisite: MUM 301-01.

**MUM 304 Media Systems and Publishing (4-0-3).** Explores various methods of distribution through current and future platforms and provides comprehensive understanding of media as a system. Examines the relationship between commerce, design and communication. Prerequisite: MUM 301-01. Lab/Tech fee rate A applies.

**MUM 311 Animation (4-0-3).** Introduces the principles of animation through exploration of traditional animation techniques, concepts and storyboarding. Emphasizes the production of images in motion and expression utilizing traditional or digitally aided processes. Prerequisite: ARC 201 or DES 230 or IDE 201 or MUM 201 or VIS 201 or MCM 200. Lab/Tech fee rate A applies.

**MUM 320 Web Design I (4-0-3).** Explores web design through examination of developments in digital media and Internet enabling technologies. Introduces communication design practices for the World Wide Web. Considers information design, navigation plans and elements of interactivity in designing web pages. Addresses the skills necessary to design, author and edit web pages to create a coherent website. Prerequisite: ARC 201 or DES 230 or IDE 201 or MUM 201 or VIS 201 or MCM 200. Lab/Tech fee rate A applies.

**MUM 330 Web Design II (4-0-3).** Explores the process of web design from proposal to production through the fusion of content and interactivity. Studies dynamic web environments through the exploration of interactive authoring tools. Focuses on the tools and techniques of website development and management. Prerequisite/concurrent: MUM 320. Lab/Tech fee rate A applies.

**MUM 331 3D Animation (4-0-3).** Addresses strategies and production pipeline in 3D modeling and animation: non-linear animation strategies, texture mapping, dynamics, lighting and rendering for contemporary professional output. Prerequisite: MUM 201 or MUM 311. Lab/Tech fee rate A applies.

**MUM 340 Interactive Environments (4-0-3).** Focuses on design and implementation of interactive applications and environments. Covers narrative, content development, information architecture, patterns of interactive structures, interface design, user-orientation and user-engagement. Consider the development of interactive applications through prototyping and the progressive testing of design solutions. Addresses instructional and learning systems, computer games, interactive fiction and multimedia-supported business applications. Prerequisite: ARC 201 or DES 230 or IDE 201 or MUM 201 or VIS 201 or MCM 200. Lab/Tech fee rate A applies.

**MUM 360 Multimedia Design History and Theory (3-0-3).** Examines the origins and history of multimedia design and its technologies. Surveys critical media culture readings from both the theoretical field of media studies and the creative works of artists, designers, filmmakers and writers. Prerequisite: DES 231.

**MUM 397 Internship in Multimedia Design (0-0-0).** Requires a minimum of five weeks (normally 200 hours) of approved professional experience. Requires the work undertaken to be documented in a formal report submitted to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: MUM 302-01 and approval of internship coordinator. Registration fee applies.

**MUM 405 Multimedia Design Studio V (12-0-6).** Focuses on the development of topical discipline-specific or inter-/trans-disciplinary design projects. Explores local, regional and/or global themes through individual and/or collaborative projects. Repeatable only once. Prerequisite: MUM 302-01.

**MUM 406 Multimedia Design Studio VI (12-0-6).** Focuses on the development of a comprehensive multimedia design project. Addresses the role of research, analysis and synthesis in professional design practice. Covers aspects of planning, management and production. Requires an approved student-initiated or faculty-directed capstone/topical project. Repeatable only once. Prerequisite: MUM 405.

**MUM 498 Studio Abroad (3 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Repeatable only once. Prerequisite: studio specific.

## UPL Urban Planning

**UPL 201 Introduction to Urban Planning (3-0-3).** Introduces the discipline of urban planning. Surveys the history of the field as well as its links with other fields of environmental studies, such as architecture, urban design, geography and engineering. Provides an overview of what planners

do and the tools they use in their practice. Prerequisite: WRI 102.

**UPL 302 Analysis of Spatial Phenomena (3-0-3).** Addresses key concepts and technical skills involved in analyzing spatial phenomena. Covers topics such as spatial inferences, cartographic quality, geospatial data, exploratory spatial data analysis, and analytical concepts and methods. Emphasizes a working knowledge of geographic information systems and related software applications. Prerequisites: junior standing, any 100-level MTH course, and WRI 101. Lab/Tech fee rate A applies.

## VIS Visual Communication

**VIS 201 Design Studio I (6-0-3).** Introduces principles of visual composition and organization through systems-based approaches to design. Explores formal relationships of varying complexity- from simple abstractions to the articulation of multiple categories of text and image-based information. Presents strategies to manage content. Examines denotation and connotation in visual communication. Addresses the integration of digital media within design projects. Restricted to students formally admitted to the BSVC degree program. Repeatable only once. Prerequisites: DES 112, DES 121, DES 122, DES 132, MTH XXX and WRI 101. Lab/Tech fee rate A applies.

**VIS 202 Design Studio II (6-0-3).** Covers essential typographic, compositional and imaging techniques. Examines strategies of creating, manipulating and combining text and images to facilitate communication. Explores varied means of visualization for print-or time-based media. Introduces the role of sequencing and transformation in communicating visual and textual information. Repeatable only once. Prerequisite: VIS 201. Lab/Tech fee rate A applies.

**VIS 213 Illustration Drawing (4-0-3).** Builds on skills introduced in foundation drawing and encourages students to utilize a wide variety of illustration media and techniques. Class projects focus on drawing from life, photo reference gathering techniques, and visualizing concepts and ideas within the genre of commercial illustration. Prerequisite/concurrent: ART 111 or DES 111. Lab/Tech fee rate A applies.

**VIS 221 Photography Basics (4-0-3).** Introduces basic photographic skills of camera control and photographic practice through the use of digital technology. Introduces and explores topics relating to the history and theory of photographic practice. Prerequisite: DES 101 or DES 131. Lab/Tech fee rate A applies.

**VIS 231 Typography I: Normative Typographic Principles (4-0-3).** Introduces the fundamental conventions and vocabulary associated with typography. Addresses information hierarchy through the study of visual form and structure. Explores the editorial and expressive potentials of typography. Engages traditional and digital technologies within coursework. Prerequisite/concurrent: ARC 201 or DES 200 or IDE 201 or MUM 201 or VIS 201. Lab/Tech fee rate A applies.

**VIS 242 Electronic Online Publishing (4-0-3).** Introduces fundamental concepts and practical applications of web and electronic publishing. Examines the potential of media authored content through short, basic exercises using relevant technologies. Prerequisite: VIS 201 or DES 200. Lab/Tech fee rate A applies.

**VIS 301 Design Studio III (6-0-3).** Examines the relationship between visual form and content. Addresses the role of semiotics in visual communication. Emphasizes the application of methods and strategies used in the design of print-based publications for general and/or specific audiences. Repeatable only once. Prerequisite: VIS 202.

**VIS 302 Design Studio IV (6-0-3).** Explores representations of abstract ideas in the form of symbols and logotypes. Covers research methods and design strategies associated with the development of visual identity systems. Addresses the role of branding, the development of project briefs, logo design, and the development and application of visual identity standards. Repeatable only once. Prerequisite: VIS 301.

**VIS 311 Illustration Design (4-0-3).** Introduces students to various techniques of idea generation by focusing upon illustration as a means of conveying ideas and concepts. Encourages students to arrive at visual equivalents to written and/or oral texts in the contexts of the history of design and illustration. Prerequisite: VIS 213 or ART 211.

**VIS 312 Illustration Genres (4-0-3).** Explores the potential of 19th and 20th century illustration genres as a means of visual communication. Investigates use of historical illustration styles in a contemporary context. Prerequisite: VIS 213 or ART 211.

**VIS 313 Visual Narrative (4-0-3).** Explores narrative and storytelling structures in design including storyboarding and sequential drawing. Examines history and current practice in sequential visual arts. Emphasizes research, drawing and rendering skills needed to develop characters in sequential formats such as animation, film, illustration, children's and juvenile books, and graphic novels. Prerequisites: VIS 213 or ART 211, and ENG 203 or ENG 204. Lab/Tech fee rate A applies.

**VIS 320 Printmaking: Lithography and Screen Printing Methods (4-0-3).** Introduces basic concepts and skills in traditional and contemporary lithography, screen printing and alternative printmaking methods while developing a firm skills base. Investigates traditional mechanical and digital experimental reproductive processes across a range of disciplines. Prerequisite: VIS 201 or ARC 201 or ART 211 or DES 200 or IDE 201 or MUM 201. Lab/Tech fee rate B applies.

**VIS 321 Photojournalism (4-0-3).** Explores the history and practice of photojournalism. Students are expected to have sound black and white technical skills, as the course focuses on developing personal awareness and vision within the medium of photography. Through a series of slides, lectures and small photographic assignments, the course will investigate subject matter through the development of the photographic essay. Prerequisite: VIS 221, or DES 160 and DES 362. Lab/Tech fee rate A applies.

**VIS 322 Printmaking: Relief and Intaglio Methods (4-0-3).** Introduces basic concepts and skills in traditional and contemporary relief and intaglio printing and production methods while developing a firm skills base to be expanded upon. Examines the role of the relief and intaglio reproduction in material culture. Examines traditional and experimental applications in two- and three-dimensional work across a range of disciplines. Prerequisite: VIS 201 or ARC 201 or ART 211 or DES 200 or IDE 201 or MUM 201. Lab/Tech fee rate B applies.

**VIS 323 Photography for Communication (4-0-3).** Covers the theory and practice of constructed or stage photography. Examines techniques and processes to develop abilities related to effective visual communication. Focuses on theme work and the development of a portfolio. Prerequisite: VIS 221 or ARC 316, or DES 160 and DES 362. Lab/Tech fee rate A applies.

**VIS 325 Creative Studio Photography (4-0-3).** Explores the control and manipulation of artificial lighting for creative effect in a photography studio environment. Practical applications of studio flash lighting are introduced and explored via

practical assignment work. In addition students will be introduced to significant examples of photographers' work that exploit the controlled use of lighting. Prerequisite: VIS 221 or ARC 316, or DES 160 and DES 362. Lab/Tech fee rate B applies.

**VIS 326 Screen Printing: Methods and Techniques (4-0-3).** Develops skills in screen printing and its potential applications for both paper and alternate surfaces. Explores the different techniques for developing screen print initially using paper and hand-painted stencils and then moving onto photographic stencils and combinations of the two. Prerequisite: VIS 202 or ARC 202 or DES 300 or IDE 202 or MUM 202. Lab/Tech fee rate B applies.

**VIS 327 Analog Photography Processes (4-0-3).** Covers the practice of 35mm analog photography. Explores darkroom printing techniques and processes central to effective visual communication. Focuses on theme work and the development of a portfolio. Prerequisite: VIS 221 or ARC 316, or DES 160 and DES 362. Lab/Tech fee rate A applies.

**VIS 331 Typography II: Complex Typographic Systems (4-0-3).** Explores the relationship between content and form in typographic design. Examines the normative and expressive aspects of typography and how they function in micro publications, complex multi-page and or multilingual publications, wayfinding and information systems, and text for exhibitions supported by reference and analysis of contemporary case studies. Focuses on analyzing content, its meaning, and the intended goals and needs of both the information provider and the information user. Prerequisite/concurrent: VIS 301. Lab/Tech fee rate B applies.

**VIS 342 Environment, Experience and Interaction Design (4-0-3).** Explores the intersection of visual communication and the built environment through lectures, case-study analysis and studio projects. Covers wayfinding systems, architectural graphics, signage, dynamic environments and mapping. Prerequisite: VIS 301. Lab/Tech fee rate B applies.

**VIS 361 The Design Profession (3-0-3).** Deals with issues of working in design-related fields, including professional practice, intellectual property, employability, freelancing and working within a cultural context. Imparts knowledge of the region's design industry, through research and field trip documentation. Prepares students for their summer internships. Open to Department of Art and Design students only. Prerequisite/concurrent: DES 360 or MUM 360.

**VIS 397 Internship in Visual Communication (0-0-0).** Requires a minimum of five weeks (normally 200 hours) of approved professional experience. Requires the work undertaken to be documented in a formal report submitted to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: VIS 302 and approval of internship coordinator. Registration fee applies.

**VIS 405 Design Studio V (12-0-6).** Focuses on the development of topical discipline-specific or inter-/trans-disciplinary design projects. Explores local, regional and/or global themes through individual and/or collaborative projects. Restricted to BSVC students. Repeatable only once. Prerequisite: VIS 302.

**VIS 406 Design Studio VI (12-0-6).** Focuses on the development of a comprehensive communication design project. Addresses the role of research, analysis and synthesis in professional design practice. Covers aspects of planning, management and production. Requires an approved student-initiated or faculty-directed capstone/topical project. Restricted to BSVC students. Repeatable only once. Prerequisite: VIS 405.

**VIS 498 Studio Abroad (1 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Repeatable only once. Prerequisites: VIS 202 and consent of the department.

## AUS Courses Offered Abroad

AUS courses offered abroad provide degree-seeking students with the opportunity to complete and earn credit hours for AUS courses or AUS studios that are conducted in a regional or an international site.

**Course Abroad (1 to 3 credit hours).** Features on-site visits offering the opportunity to experience first-hand regional and international design practices or to engage in site-specific design projects, highlighting particular themes relevant to the specific location. Department permission is required for enrollment and credit. Can be repeated for credit. Prerequisites: topic specific. Lab/Tech fee may apply.

**Studio Abroad (3 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Repeatable only once. Prerequisite: studio specific (see specific entries earlier in this section).

Courses abroad are numbered as 193, 293, 393 or 493 courses. Studios abroad are numbered as 498. The three-letter course prefix reflects the field of study of the course.

Descriptions of AUS courses offered abroad are made available in the college during registration.

## Independent Study

Independent study is the umbrella term used to label two types of independent work: independent course and directed study.

Students are allowed to take one independent study. A second independent study could be approved by the student's associate dean for graduation purposes only.

**Independent Course (1 to 4 credit hours).** An existing course offered in an independent study format. The course is coded using the course number in the catalog. Approved special topic courses can be offered in an independent course format.

Students are not allowed to repeat courses in an independent course format.

To be eligible to apply for an independent course, students must be in good academic standing.

**Directed Study (1 to 4 credit hours).** An investigation under faculty supervision beyond the scope of existing courses. Prerequisites: minimum CGPA of 3.00, Junior II standing and consent of the instructor.

Directed study courses are numbered as 396 or 496 courses. The three-letter course prefix reflects the field of study of the course (e.g., directed study courses in architecture are coded as ARC 396 or ARC 496).

For more details on independent study, please refer to Registration in Independent Study Courses in the Academic Policies and Regulations section of this catalog.

## Interdisciplinary Study Courses

Interdisciplinary study (IDS) courses provide opportunities for students to benefit from collaboration by faculty from a range of disciplines. Courses with an IDS course code are normally

co-taught by two or more faculty members and focus on topics beyond those offered in existing courses. Prerequisites: topic specific. Lab/Tech fee may apply.

IDS courses at the 300 level require sophomore standing or above; 400-level IDS courses are restricted to junior standing and above.

Descriptions of particular IDS courses are made available during registration.

## Special Topic Courses

**Special Topic (1 to 4 credit hours).** Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit. Prerequisites: topic specific. Lab/Tech fee may apply.

Special topic courses are numbered as 194, 294, 394 or 494 courses. The three-letter course prefix reflects the field of study of the course.

Special topic courses at the 300 level require sophomore standing or above; 400-level special topic courses are restricted to junior standing and above.

Descriptions of particular special topic courses are made available in the college during registration.

# College of Arts and Sciences

## ANT Anthropology

**ANT 205 World Cultures (3-0-3).** (Formerly INS 205). Explores the varied cultures of the world. Addresses the critical importance of societal culture as a tool of human survival. Uses anthropological methods to give an appreciation of cultural differences and similarities and thereby increases understanding of the complex world with which we must cope. Prerequisite/concurrent: WRI 102.

## ARA Arabic

### Arabic Language

**ARA 105 Elementary Arabic I (3-2-3).** Introduces the Arabic script and its phonology and basic vocabulary and grammar. Builds the foundations of the four language skills (listening, speaking, reading and writing). Forms the first part of a two-semester sequence in elementary Arabic. Limited to non-native speakers of Arabic. Prerequisite: placement test.

**ARA 106 Elementary Arabic II (3-2-3).** Focuses on further developing the four language skills introduced in Elementary Arabic I. Expands knowledge of Arabic grammar and vocabulary. Fosters cultural awareness of the Arab world through the use of short texts and situational dialogues. Forms the second part of a two-semester sequence in elementary Arabic. Limited to non-native speakers of Arabic. Prerequisite: placement test.

**ARA 107 Intensive Elementary Arabic I (6-2-6).** Introduces the Arabic script, its phonology, basic vocabulary and grammar. Builds the foundations of the four language skills (listening, speaking, reading and writing) to expand knowledge of vocabulary and grammar. Fosters cultural awareness of the Arab world through the use of short texts and situational dialogues. Limited to visiting students who are non-native speakers of Arabic.

**ARA 108 Intensive Elementary Arabic II (6-2-6).** Enhances the non-native speaking student's ability to comprehend a variety of aural and written materials at a more advanced elementary level. Develops communicative abilities in terms of expressing themselves with Arabic-speaking peers both orally and in writing. Builds the Arabic language competency of non-native speakers of Arabic. Limited to visiting students who are non-native speakers of Arabic. Prerequisite: ARA 107 or placement test.

**ARA 203 Intermediate Arabic I (3-2-3).** Develops the four basic language skills (listening, speaking, reading and writing) with emphasis on the oral and written skills, as part of a two-term sequence in intermediate Arabic. Introduces Arab culture through the use of authentic reading materials drawn from different genres, such as literature, history, politics and science. Limited to non-native speakers of Arabic. Prerequisite: placement test.

**ARA 204 Intermediate Arabic II (3-2-3).** Develops the four basic language skills—listening, speaking, reading and writing—as part of a two-term sequence in intermediate Arabic. Introduces Arab culture through the use of appropriate reading materials from literary, historical, political and scientific genres. Limited to non-native speakers of Arabic. Prerequisite: ARA 203 or permission of instructor.

**ARA 205 The Language of the Qur'an (3-0-3).** (In Arabic). Introduces the language of the Qur'an from a linguistic perspective. Examines the semantic, syntactic and rhetorical elements that substantially affect comprehension of the Qur'anic text. Prerequisite: permission of the instructor.

**ARA 210 Composition for Native Speakers of Arabic (3-0-3).** (In Arabic). Aims to develop the writing skills of the native speaker of Arabic. Develops themes such as letter writing and gives attention to the development of personal style. Takes a historical look at styles of composition in Arabic.

**ARA 220 Composition for Non-Native Speakers of Arabic (3-0-3).** (In both Arabic and English). Aims to develop the writing skills of non-native speakers of Arabic. Develops themes such as letter writing and gives attention to the development of different styles in modern and contemporary Arabic writings.

**ARA 308 Arabic Grammar in Use (3-0-3).** (In Arabic). Provides an overview of the historical background of Arabic grammar, its origin, schools, and place within and impact upon the Arabic language, history and culture. Covers the syntactic and morphological structures of Arabic that contribute to coherence and semantics and applies them practically to sociolinguistic contexts. Addresses traditional and modern approaches to Arabic grammar in use. Prerequisite: permission of instructor.

**ARA 309 Business Arabic (3-0-3).** (In Arabic). Develops abilities in reading and writing Arabic-language business documents and proposals. Teaches Arabic speaking and listening skills necessary for effective communication in the business world. Prerequisite: ARA 210.

**ARA 314 Media Arabic (3-0-3).** (In Arabic). Teaches and practices the language skills necessary to comprehend and contribute to a wide range of Arabic-language media. Prerequisite: ARA 210.

**ARA 340 The Social Context of Arabic (3-0-3).** (In English). Examines the language situation in the Arab world including matters such as Arabic diglossia, code switching, language attitudes, language planning and policy, language variation, language and education, gender and language, minority languages, multilingualism, and social and national identity and language use. Prerequisite: ENG 203 or ENG 204.

**ARA 360 Arabic Linguistics (3-0-3).** (In Arabic). Addresses the history and development of the Arabic language and its relation to Arab culture and history. Covers the main areas of Arabic linguistics: phonology (the sounds of the language), morphology (the structure of words), semantics (study of meaning) and syntax (types and structure of sentences). Focuses on the analysis of Arabic texts. Prerequisite: ARA 205 or ARA 206 or ARA 207 or ARA 210 or ARA 220 or TRA 210 or TRA 220.

**ARA 404 Working with MSA Texts (3-0-3).** (In Arabic). Builds on the earlier Arabic courses using materials that are more advanced. Uses Modern Standard Arabic texts (political, economic and social) to develop further the grammatical structures and the four skills practiced in earlier courses. Covers advanced language competency and skills such as skimming, summarizing, paraphrasing and extended writing. Prerequisite: ARA 203 or ARA 204 or ARA 210.

### Arabic Literature

**ARA 101 Introduction to Arabic Heritage I (3-0-3).** (In both Arabic and English). Introduces the intellectual, literary, artistic and cultural contributions of the Arabs to world

civilization from pre-Islamic times to the fall of Baghdad in 1258 CE.

**ARA 102 Introduction to Arabic Heritage II (3-0-3).** (In both Arabic and English). Introduces the intellectual, literary, artistic and cultural contributions of the Arabs to world civilization from the fall of Baghdad in 1258 CE to the end of the 19th century.

**ARA 201 Arabic Literature in Translation (3-0-3).** (In English). Provides a detailed study of genre and theme in Arabic literature with special emphasis on the modern period. Prerequisite: WRI 102.

**ARA 206 Modern Arabic Prose (3-0-3).** (In Arabic). Surveys the renaissance of Arabic prose from the 19th century to the present. Examines the modern Arabic novel, short story, play and autobiography. Studies the rise of these fundamentally Western literary forms in the Arab world as a result of the Arab "Awakening" (*al-Nahda*). Prerequisite: ARA 101.

**ARA 207 Arabic Drama (3-0-3).** (In Arabic). Looks at the emergence of Arabic drama in the 19th century until the present day and assesses prototype drama forms of the medieval period. Provides, through a study of selected plays by prominent authors, a picture of the influence of Arabic drama on Arabic literature. Prerequisite: ARA 101.

**ARA 301 Arabic Prose to the end of the Abbasid Era. (3-0-3).** (In Arabic). Explores the development of classical Arabic prose and its various genres in the Arabic literary tradition until the end of the Abbasid period. Examines major themes, techniques and authors through the study of selected primary texts. Contextualizes Arabic literary culture in its social, intellectual and political milieus. Engages with the complex relationships between literary prose and the diverse forms of knowledge production that existed in this period.

**ARA 304 Modern Arabic Poetry (3-0-3).** (In Arabic). Surveys the renaissance of Arabic poetry from the 19th century to the present. Prerequisite: ARA 101.

**ARA 306 Arabic Travel Writings (3-0-3).** (In Arabic). Explains different themes in the genre of Arabic travel writing. Examines the journey as a metaphor, a venue for self-expression, a quest for identity and a site for cultural encounter. Critiques Arabic travel writing texts as part of Arabic heritage within their social and cultural contexts. Analyzes the style, language and narrative devices applied in this type of writing. Prerequisites: ARA 101 or ARA 102, and ENG 203 or ENG 204.

**ARA 403 War and Peace in Arabic Literature and Film (3-0-3).** (In English). Analyzes the way the twin themes of war and peace have been treated in modern Arabic literature and film by surveying Arabic novels, short stories, poetry, autobiographies and selected feature films. Prerequisite: ENG 203 or ENG 204.

## Arab/Islamic Culture and Civilization

**ARA 103 Arabic Music in a Historical Context (3-0-3).** (In English). Studies the historical development of Arabic Classical and folk musical genres from the pre-Islamic to modern times. Examines music in its dialectical relationship with political and social climates of Arab culture.

**ARA 181 The Life of Muhammad (Seerah) (3-0-3).** Provides a historical account of the life of the Prophet Muhammad as established in the Seerah, with a focus on the social, economic and religious conditions among the inhabitants of the Arabian Peninsula before and after the advent of Islam. Examines the impact and legacy of the Prophet on the various aspects of life and the building of the Muslim community.

**ARA 240 Arab-Islamic Culture and Civilization (3-0-3).** (In English). Examines the rise of Islam as a major world civilization. Provides an overview of the manifestation of Islamic culture in Arab history through the study of the basic Islamic texts and the contributions of Muslim intellectuals. Prerequisite: ARA 101 or ARA 102.

**ARA 280 Introduction to Hadith (3-3-0).** (In English). Covers the role and application of Hadith in Islam. Considers Hadith as a genre of Arabic literature. Discusses the development, preservation, and codification of Hadith in the classical period and its uses in the classical and modern periods. Prerequisite/concurrent: WRI 101.

**ARA 281 The Art of Qur'anic Recitation (Tajweed) (3-0-3).** (In Arabic). Provides an overview of the history and schools of Tajweed. Addresses the rules governing the correct oral rendering of the Hafs mode of reciting the Qur'an and their practical application, namely, those related to the nūn sākinah and nunnation (dissimilation/vocalization, assimilation with and without nasalization, incomplete assimilation, sound replacement), mīm sākinah, types of vowel prolongation, qalqalah and pause positions. Prerequisite: oral placement test.

**ARA 302 Arab Identity and Thought (3-0-3).** (In English). Examines representative writings by Arab authors dealing with Arab identity formation in relation to or in opposition to other nations and cultures. Prerequisite: WRI 102.

**ARA 303 Classical Arab/Islamic Culture (3-0-3).** (In English). Explores the ways in which Islam has shaped the history and culture of the Arabs and discusses some of the significant features of Arab/Islamic culture and the several contributions this culture has made. Prerequisite: WRI 102.

**ARA 307 Arabs and the "Other" (3-0-3).** (In Arabic). Examines the Arab's perception of the "Other" as deployed and surveyed in Arabic literary, geographical and historical primary texts as part of Arabic heritage. Analyzes the perspectives and narrative techniques of Arab writers expressed in these texts. Considers the significance of cultural encounter for the growth of national, regional and global exchange. Prerequisite: ARA 101 or ARA 102.

**ARA 320 The Andalusian Symbiosis (3-0-3).** (In English). Introduces the cultural symbiosis between Muslims and Europeans during the eight centuries of Muslim rule in the Iberian Peninsula. Examines and reevaluates the literary and cultural developments of that time. Discusses the historical, literary, linguistic and artistic products of Al Andalus. Prerequisite: junior standing.

**ARA 380 Sufism: Readings in Islamic Mysticism (3-0-3).** (In English). Discusses the salient features of the mystical dimension within Islam. Covers the historical background of the tradition and the foremost personalities who played a major role in its development. Examines the primary concepts promoted in Sufism and their manifestation, in both a religious and social context, through the classical works that present both Sufi theory and practice. Prerequisites: ARA 101 or ARA 102, and ENG 203 or ENG 204.

**ARA 383 Islamic Law and Jurisprudence (3-0-3).** (In English). Discusses the incremental evolution of the legal tradition in Islam to contextualize the juristic contributions of the foremost personalities who played a major role in its genesis. Examines the sources of Islamic law (*al-masadir*), its evidence (*al-adilla*), its guiding principles (*al-usul*), its jurisprudential maxims (*al-qawa'id*) and its underlying objectives (*al-maqasid*), which underpin the structure of Islamic legal theory. Prerequisites: ARA 240, and ENG 203 or ENG 204.

**ARA 385 Islamic Texts in Translation (3-0-3).** (In English). Explores the development of the Arab-

Islamic intellectual tradition and traces the genesis of religious learning by examining the influence of the Islam's primary sacred texts and how they shaped the religion's intellectual history. Discusses the literary production of this evolution by selectively examining a range of Islamic texts from a number of disciplines such as Islamic jurisprudence (*fiqh*), scholastic theology (*kalam*) Arab philosophy (*falsafa*) and Islamic spirituality and mysticism (*tazkiyat al-nafs*). Prerequisite: ENG 203 or ENG 204.

**ARA 402 Qur'anic Studies (3-0-3).** (In English). Aims to develop the understanding of major topics in Qur'anic studies such as the revelation of the Qur'an, the characteristic features of Meccan and Medinan revelations, the notion of abrogation in the Qur'an, circumstances of revelation and parables in the Qur'an and their moral lessons. Provides the opportunity to study Qur'anic exegesis and to explore the Qur'an's various themes and theological, spiritual and legal concepts. Requires a basic understanding of Qur'anic script. Prerequisites: ARA 101, and ENG 203 or ENG 204.

## BIO Biology

**BIO 101 General Biology I (3-3-4).** Covers the molecular basis of life, the carbon atom, cells, organelles, plant and animal physiology, genetics, speciation, evolution, the origins of life and bacteriology. Provides an in-depth study of biology in preparation for a profession in biology. Lab/Tech fee rate A applies.

**BIO 102 General Biology II (3-3-4).** Covers plant and animal diversity, animal evolution, plant and animal form and function, body systems, animal behavior, ecology and conservation biology. Provides an in-depth study of organism biology in preparation for a profession in biology. Prerequisite: BIO 101. Lab/Tech fee rate A applies.

**BIO 103 Introduction to Human Biology (3-0-3).** Surveys biological concepts with a strong emphasis on human biology. Includes the following topics: the scientific method, biochemistry, cell biology, functions and dysfunctions of the human organ systems and a strong emphasis on maintaining a healthy lifestyle. Not open to science or engineering students.

**BIO 210 Introduction to Human Anatomy and Physiology (3-0-3).** Provides a basic foundation in human anatomy and physiology with an emphasis on the normal functions of the major human organ systems. Discusses current literature on some human diseases resulting from dysfunction. Prerequisite: BIO 101.

**BIO 251 Ecology (2-3-3).** Covers the general principles of ecology with an emphasis on desert ecology and conservation. Includes case studies that illustrate important ecological principles. Includes laboratory excises that emphasize basic field ecology techniques, experimental design, data collection, modeling and analysis. Requires the completion of two professional-quality written reports. Not open to students in the BSB degree program who have not yet met the program's formal admission requirements. Prerequisite: BIO 102. Lab/Tech fee rate A applies.

**BIO 260 Genetics and Molecular Biology (3-3-4).** Introduces the general principles of genetics from Mendelian to modern molecular genetics. Covers DNA replication, transcription, translation, mutations, gene regulation, quantitative genetics, genetic engineering and genomics. Includes genetic applications in medicine, agriculture and law enforcement. Illustrates general principles discussed in class with laboratory experiments using modern equipment. Prerequisite: BIO 102. Lab/Tech fee rate B applies.

**BIO 310 General Physiology (3-3-4).** Explores the general physiology of multicellular organisms and emphasizes the mechanisms that coordinate activities of cells and tissues within these multicellular organisms. Assists in developing an understanding of cellular and biochemical processes fundamental to the survival of living organisms. Relates cellular processes to the organismal level and contrasts the differences in these processes as they occur in different organisms. Introduces examples of different organisms to illustrate various physiological principles. Prerequisite: BIO 210. Lab/Tech fee rate A applies.

**BIO 330 Ecosystems Management (3-0-3).** Focuses on the policies of ecosystems management from a scientific and natural approach. Gives special attention to current research and case studies of organism adaptations and roles in specific habitats and adverse environments, and to formulate approaches and policies most suitable for the management of natural, restored and artificial ecosystems. Reviews management practices in light of current scientific and sociobiological understanding of biodiversity, conservation and sustainability. Prerequisite: BIO 251.

**BIO 332 Cell Biology (3-0-3).** Includes all of the concepts related to the cell, the "unit of life." Focuses on the metabolic pathways of the cell as they relate to the structure and function of cell organelles and other anatomical components. Covers macromolecules of the cell, biosynthesis, bioenergetics, metabolic regulatory mechanisms, membrane structure and transport, intracellular compartments and transport, cytoskeletal systems, cellular movement, cell communication and signal transduction mechanisms. Not open to students in the BSB degree program who have not yet met the program's formal admission requirements. Prerequisite: BIO 260.

**BIO 335 Microbiology (3-3-4).** Covers the biology of microorganisms (viruses, bacteria, fungi and helminthes). Emphasizes the role they play in our lives, especially as related to epidemiology, health, prevention of infection and identification. Teaches sterile techniques, how to culture and identify bacteria, and how to control them in clinical, personal and environmental settings. Prerequisite: BIO 101. Lab/Tech fee rate A applies.

**BIO 341 Principles of Pharmacology (3-0-3).** Covers the general physical and chemical properties of drugs, along with their mechanisms of action and side effects. Relates drug-receptor interactions at the cellular level to pathophysiological effects on major organ systems. Explores the clinical application of a variety of medicinal drugs. Introduces the fundamentals of drug discovery and pre-clinical development and the latest frontiers in drug delivery methods. Prerequisite: BIO 210 or BIO 310.

**BIO 355 Medical Parasitology (3-0-3).** Covers the epidemiology of human parasitic infections, life cycles, routes of transmission, prevention and control measures, and parasites that infect humans. Focuses on the routine laboratory diagnostic methods and clinical picture. Explores the importance of medical parasitology through the study of waterborne and foodborne outbreaks and case presentations. Prerequisite: BIO 335.

**BIO 361 Evolution and Biodiversity (3-0-3).** Introduces principles of evolution as applied to all organisms. Covers the origins of life, the history of evolution, biogeography, population genetics, speciation, phylogenetic analysis, human evolution and applications to current problems in agriculture, species conservation, population dynamics and the effects of environmental change. Prerequisite: BIO 260.

**BIO 371 Principles of Neuroscience (3-0-3).** Covers the basic principles of

organization and function of the mammalian nervous system. Illustrates the function of neurons, synaptic transmission, sensory systems, and complex brain function. Emphasizes the key mechanisms involved in brain development, neural signaling, and neural correlates of sensory perception. Discusses primary literature in neuroscience with emphasis on research in cellular physiology and sensory systems. Prerequisite: BIO 210.

**BIO 421 Marine Environments (2-3-3).** Focuses on interactions between biological, chemical and physical processes in marine environments. Places strong emphasis on marine ecology and local fauna of the Gulf region. Includes the following topics: marine physics and chemistry and their importance to marine biology, oceanic plankton and nekton, deep-water biology, coastal habitats, energy flow, fisheries and marine conservation issues. Prerequisite: BIO 251. Lab/Tech fee rate A applies.

**BIO 461 Desert and Maritime Plants (3-0-3).** Provides a good working knowledge of the desert and maritime plants that are unique to the United Arab Emirates. Develops familiarity with the proper taxonomy and identification of species, and provides knowledge about the environment in which they grow. Emphasizes the adaptations of plant species to the special stresses plants encounter in the hot, dry and often salty environments found in this region. Prerequisite: BIO 251.

**BIO 481 Cellular and Molecular Immunology (3-0-3).** Covers basic principles of cellular and molecular immunology with special emphasis on development of the immune system, innate and adaptive immunity, cells and tissues of the immune system, antibody structure and synthesis, complement pathways, antigen-antibody reactions, antigen presentation, humoral and cell-mediated immune responses, and transplantation. Discusses major topics related to diseases and conditions such as allergies, autoimmune diseases, and immunodeficiency. Prerequisite: BIO 335.

**BIO 491 Senior Research Project I (0-6-3).** Requires selection of a biology problem for an independent research project. Upon approval of the department, the student begins with a literature search then follows up with laboratory studies. The results are then presented in a seminar as well as thesis form. Prerequisite: senior standing. Lab/Tech fee rate B applies.

**BIO 492 Senior Research Project II (0-6-3).** Continuation of BIO 491. Requires selection of a new or related biology problem for an independent research project. Upon approval of the department, the student begins with a literature search then follows up with laboratory studies. The results are then presented in a seminar as well as thesis form. Prerequisite: senior standing. Lab/Tech fee rate B applies.

## CHM Chemistry

**CHM 101 General Chemistry I (3-3-4).** Covers the fundamental chemical principles, concepts and laws. Includes the following topics: reaction stoichiometry, types of chemical reactions, solution stoichiometry, gas laws, kinetic theory of gases, thermochemistry, atomic structure and periodicity, the Bohr model, Lewis structures, ionic and covalent bonding. Laboratory experiments illustrate principles discussed in the course. Lab/Tech fee rate A applies.

**CHM 102 General Chemistry II (3-3-4).** Covers the solid state and crystallography, the liquid state and phase diagrams, properties of solutions, including colligative and chemical properties; reaction kinetics, acid-base and complex ion equilibria; laws of thermodynamics; enthalpy and free energy; electrochemistry; and nuclear chemistry. Includes laboratory experiments illustrating principles discussed in the course. Prerequisite: CHM 101. Lab/Tech fee rate A applies.

**CHM 104 Basics of Chemistry (3-0-3).** Introduces the fundamental chemical principles, concepts and laws. Includes atomic theory, atomic structure and periodicity; chemical bonding; reaction stoichiometry and chemical accounting; physical states and intermolecular forces; gas laws and the kinetic-molecular theory; acids; bases and redox reactions; nuclear chemistry; organic chemistry; and topics dealing with chemistry and everyday life. Not open to science and engineering students.

**CHM 215 Organic Chemistry I (3-0-3).** Surveys reactions of aliphatic and aromatic compounds including modern concepts of bonding, mechanisms, conformational analysis and stereochemistry. Includes the following topics: alkanes and cycloalkanes; alkenes; alkynes; biologically active acetylenic compounds; electrophilic and nucleophilic reactions; resonance; alkyl halides; and SN1, SN2, E1 and E2 mechanisms. Not open to students in the BSB, BSC and BSES degree programs who have not yet met the program's formal admission requirements. Prerequisite: CHM 102.

**CHM 216 Organic Chemistry II (3-0-3).** Deals with modern spectroscopic techniques for structure determination; chemistry of oxygen and nitrogen compounds; and chemistry of alcohols, ethers, carbonyl compounds and amines. Gives special attention to mechanistic aspects. Prerequisite: CHM 215.

**CHM 217 Organic Chemistry Laboratory I (0-4-1).** Includes experiments on purification, separation and identification techniques, as well as synthesis of various organic compounds. Prerequisite: CHM 215. Lab/Tech fee rate A applies.

**CHM 218 Organic Chemistry Laboratory II (0-4-1).** Includes experiments related to the theoretical principles and synthetic methods of modern organic chemistry. Prerequisites: CHM 216 and CHM 217. Lab/Tech fee rate A applies.

**CHM 221 Basic Concepts of Inorganic Chemistry (3-0-3).** Introduces basic concepts of inorganic chemistry. Covers atomic structure and the periodic table; molecular models, Lewis structure, electron pair repulsion model, hybridization and its use in explaining molecular properties; symmetry, point groups, electronic transitions and molecular vibrations; and molecular orbital theory of homonuclear and heteronuclear diatomic molecules and some triatomic molecules. Includes applications of inorganic compounds in environmental systems. Prerequisite: CHM 102.

**CHM 242 Quantitative Analysis (3-0-3).** Introduces the basic theories underlying analytical methods of chemical analysis. Covers fundamentals and applications of electrochemistry, complexiметric titrations, gravimetric and combustion analysis, spectrophotometry and chromatography. Gives special attention to complex systems and analysis of environmental samples. Not open to students in the BSC and BSES degree programs who have not yet met the program's formal admission requirements. Prerequisite: CHM 102.

**CHM 243 Quantitative Analysis Laboratory (0-3-1).** Comprises experiments that apply analytical methods to chemical analysis. Employs a variety of wet and dry analytical techniques associated with complex acid/base titrations systems, electrochemistry, complexiметric titrations, gravimetric and combustion analysis, and spectrophotometry. Emphasizes replicate measurements and statistical analysis. Prerequisite/concurrent: CHM 242. Lab/Tech fee rate B applies.

**CHM 315 Organic Chemistry III (3-0-3).** Covers chemistry and reactions of B-dicarbonyl compounds, neighboring group effects, phenols, aryl halides, electrocyclic and cycloaddition reactions, thiols, reactions and synthesis of heterocyclic amines, carbohydrates, amino acids, proteins, and natural and synthetic polymers. Prerequisite: CHM 216.

**CHM 321 Chemistry of Transition Metals (3-3-4).** Covers principles and applications of transition metal chemistry. Includes the following topics: coordination chemistry, group theory, organometallic reaction mechanisms, electrochemistry, photochemistry, bioinorganic chemistry, catalysis and applications to organic synthesis. In the practical part, typical inorganic complexes of some non-transition and transition elements are prepared and characterized using physical methods and spectroscopic techniques. Prerequisite: CHM 221. Lab/Tech fee rate B applies.

**CHM 330 Physical Chemistry I (3-0-3).** Investigates in depth the basic concepts of thermodynamics. Analyzes the properties of gases as the basis for the study of the laws of thermodynamics, which are applied to questions of chemical equilibrium, phases and solutions, phase equilibrium and other applications. Prerequisites: CHM 102 and MTH 104.

**CHM 331 Physical Chemistry II (3-0-3).** Covers kinetics, electrochemistry, surface chemistry and transport properties. Emphasizes the theory of reaction rates and methods of handling kinetic data. Examines the conventions, underlying theory and practical applications of electrochemical cells. Prerequisite: CHM 330 or CHE 214.

**CHM 332 Physical Chemistry III (3-0-3).** Comprises three parts: quantum mechanics (structure of the atom, simple quantum mechanical systems, H-atom, harmonic oscillator and angular momentum); chemical spectroscopy (atomic spectrum, IR spectroscopy and electronic spectra of molecules); and statistical mechanics (Maxwell's distribution, partition and thermodynamic functions). Prerequisite: CHM 331.

**CHM 335 Physical Chemistry Laboratory (1-6-3).** Comprises individually performed experiments. Includes topics such as thermodynamics, kinetics, electrochemistry, surface chemistry and transport phenomena. Requires submission of an original report after each experiment, including sample calculations and error analysis. Prerequisite/concurrent: CHM 331. Lab/Tech fee rate B applies.

**CHM 345 Instrumental Analysis (2-3-3).** Introduces modern instrumental methods of analysis utilized by scientists and engineers. Provides an understanding of the principles, laws and operation of modern instrumentation. Reviews spectroscopic methods: mass, molecular, optical, flame and plasma. Surveys electrochemical, analytical and chromatographic techniques. Prerequisites/concurrent: CHM 242 and CHM 243. Lab/Tech fee rate B applies.

**CHM 350 Biochemistry (3-0-3).** Introduces the fundamental principles of biochemistry: protein structure and function; carbohydrates; lipids and the structure of biological membranes; enzymatic catalysis and regulations; and metabolism of carbohydrates, lipids and amino acids. Discusses the vital relationship between structure and function of major organic macromolecules. Surveys fundamental nucleic acid and protein biochemistry topics such as DNA replication, transcription and translation. Prerequisite: CHM 215.

**CHM 382 Forensic Chemistry (3-0-3).** Provides a theoretical understanding and introduces practical applications of forensic chemistry in criminal, environmental and other investigations. Covers physical evidence and basic chemical techniques used in the forensic field. Focuses on chemical problems most frequently encountered in crime labs including forensic aspects of arson, drug identification, toxicology and trace analysis. Prerequisite: CHM 215.

**CHM 415 Spectroscopy in Organic Chemistry (3-0-3).** Deals with modern methods of structure determination employing spectroscopic techniques and stereochemistry. Includes the following topics: infrared spectroscopy of organic functional groups; nuclear magnetic spectroscopy (NMR) (chemical shifts, coupling constants, first- and second-order spectra, two-dimensional spectroscopic methods); ultraviolet spectroscopy, its origin and applications to different chromophores; mass spectrometry (spectrum generation, interpretation and fragmentation patterns of various classes of organic compounds); and solving combined structure problems. Prerequisite: CHM 216.

**CHM 416 Systematic Identification of Organic Compounds (0-4-1).** Provides a comprehensive knowledge necessary to separate and identify organic compounds by wet chemistry and spectroscopic techniques. Covers preliminary examinations, physical properties, spectroscopy and derivatization studies as well as methods of separation and purification. Prerequisite: CHM 218. Lab/Tech fee rate B applies.

**CHM 431 Biophysical Chemistry (3-0-3).** Deals with the physical chemistry of biological and biochemical molecules. Covers applications of chemical potential to membranes; multiple equilibria in biochemical systems; binding of small molecules and ions to macromolecules; cooperative phenomena; types of molecular weights; transport process (diffusion, sedimentation, viscosity, and electrophoresis); polarography; light scattering; enzyme kinetics and pharmacokinetics; the physical chemistry of nucleic acids; the relation between structure and function of biological macromolecules; and conformational transitions. Prerequisite: CHM 331.

**CHM 491 Senior Research Project I (0-6-3).** Requires the selection of a chemistry problem for independent research project. Involves a literature search and laboratory studies. Involves presentation of experimental results in a seminar as well as thesis form. Prerequisite: senior standing. Lab/Tech fee rate B applies.

**CHM 492 Senior Research Project II (0-6-3).** Continuation of CHM 491. Requires the selection of a new or related chemistry problem for independent research project. Upon approval of the department, the student begins with a literature search then follows up with laboratory studies. The results are then presented in a seminar as well as thesis form. Prerequisite: senior standing. Lab/Tech fee rate B applies.

## EDU Education

**EDU 210 Philosophy of Education (3-0-3).** Focuses on the aims and purposes of education and traces the development of education and the concept of schooling from Plato and Confucius to contemporary educational thinkers. Gives special attention to issues of current educational concern including gender and educational values. Prerequisite: ENG 203 or ENG 204.

**EDU 220 Introduction to Teaching (3-0-3).** Introduces the basic issues important to the teaching profession. Covers effective teaching practices such as planning, classroom organization, behavior management and use of technology in the classroom. Explores other issues in teaching, including motivation, leadership, and multicultural and international education. Prerequisite: ENG 203 or ENG 204.

**EDU 225 Globalization and Education (3-0-3).** Introduces globalization in relation to schooling and educational issues. Explores ways that globalization has been problematized and researched in educational literature. Examines globalization from an educational stance and explores the macro and micro elements of a globalized economy. Prerequisite: ENG 203 or ENG 204.

**EDU 307 Teaching and Learning in an Electronic Environment (3-0-3).** Focuses on the prominent research and best practices trends in content and language learning, as well as the social and individual factors that affect teaching processes in an electronic environment. Explores how research and best practices in the area of e-learning can be utilized in different classroom situations. Prerequisite: ENG 203 or ENG 204.

**EDU 309 Classroom Discourse (3-0-3).** Focuses on patterns of language use in a variety of classrooms. Examines how these patterns can affect the equality or inequality of educational and learning opportunities. Analyzes discourse from the perspective of teaching practitioners in different professional settings. Prerequisite: ENG 223 or ENG 224 or ENG 234.

**EDU 315 Emotional Intelligence (3-0-3).** Examines theoretical perspectives of teaching Emotional Intelligence (EQ) within a multicultural context. Focuses on the ability to perceive and understand personal emotions and those of others to improve academic performance and helps to develop intra and interpersonal relationships. Examines ways to develop emotional intelligence (EQ) at both the personal and professional levels. Prerequisite: ENG 203 or ENG 204.

**EDU 319 Teaching and Learning in a Foreign Language (3-0-3).** Discusses various theoretical models dealing with teaching in a foreign language to children and adolescents. Examines the processes involved when reading and learning in a foreign language as well as effective instructional strategies based on current research in the field. Prerequisite: EDU 210 or EDU 220.

**EDU 325 Methodology and Materials Development (3-0-3).** Introduces pedagogical approaches, techniques and methodologies that can be useful in various educational settings. Offers the opportunity to evaluate and adapt commercially available textbooks as well as to create discipline-specific teaching materials. Prerequisite: EDU 210 or EDU 220.

**EDU 329 Curriculum Development (3-0-3).** Introduces the basic principles of effective assessment and course design. Covers evaluating learner centered/communicative curriculum, setting goals and objectives, analyzing resources, writing syllabi and conducting students' needs analyses. Prerequisite: EDU 210 or EDU 220.

## ENG English
## English Language

**ENG 203 Writing about Literature (3-0-3).** Builds upon the skills acquired in WRI 102 to develop further critical thinking and academic writing competencies. Requires reading of short stories, poetry and drama and producing a research paper using analytical and critical skills in response to literary texts. Either ENG 203 or ENG 204 can be used to meet the general education communication requirement. Prerequisite: WRI 102.

**ENG 204 Advanced Academic Writing (3-0-3).** Builds upon the skills acquired in WRI 102 to further develop critical thinking and academic writing competencies. Requires reading and responding to a variety of non-literary texts and drawing on these texts in producing a research paper whose argument demonstrates their analytical and critical thinking skills. Either ENG 203 or ENG 204 can be used to meet the general education communication requirement. Prerequisite: WRI 102.

**ENG 207 Professional Communication for Engineers (3-0-3).** Develops technical writing and professional communication skills through engineering multidisciplinary projects (EMDPs). Analyzes, through EMDPs and teamwork, the distinctive features of various professional oral and written genres. Develops and enhances work ethics, leadership, interpersonal and decision-making skills. Restricted to engineering students. Prerequisite: ENG 204.

**ENG 208 Public Speaking (3-0-3).** Introduces the art of public speaking, debate and argument. Develops confidence in public speaking through introducing the techniques of making effective presentations and through extensive practice in public speaking. Prerequisite: ENG 203 or ENG 204.

**ENG 223 Introduction to Language Study (3-0-3).** Defines language and how it works. Encourages the examination of beliefs and attitudes about language and provides the techniques of language analysis. Covers grammar and appropriate usage, oral vs. written language, formal vs. informal language, standard vs. non-standard languages, language universals and language typology. Prerequisite: ENG 203 or ENG 204.

**ENG 224 English Grammar (3-0-3).** Focuses on the fundamental rules of English grammar as they relate to sentence structure and function. Explores different systems of analysis, including an introduction to the analysis of texts. Prerequisite: ENG 203 or ENG 204.

**ENG 225 Writing for Business (3-0-3).** Aims to develop skills in writing business documents such as CVs, correspondence, memoranda, short and long reports, and proposals necessary to communicate effectively in the business world. Prerequisites: ENG 203 or ENG 204, and sophomore standing.

**ENG 226 Development of the English Language (3-0-3).** Traces the development of the English language from its Indo-European roots to the present day. Emphasizes linguistic change in English throughout its history. Prerequisite: ENG 203 or ENG 204.

**ENG 231 Writing for Visual Media (3-0-3).** Introduces existing and emerging communication technology and examines its impact on the communication process. Builds the skills for managing the process of designing documents, from the planning stage through final production. Teaches basic rhetorical principles and their application through writing articles, stories and advertising copy. Prerequisites: ENG 203 or ENG 204, and junior standing.

**ENG 234 Language in Society (3-0-3).** Introduces the sociolinguistic approach to language. Focuses on how language structure and language use are interrelated and also examines variables responsible for language variation within a speech community. Explores definitions of language, dialect, diglossia and multilingualism. Prerequisite: ENG 203 or ENG 204.

**ENG 302 Stylistics (3-0-3).** Examines the essential concepts and techniques of literary stylistics. Uses selected literary texts to illustrate and explain a variety of English language structures. Prerequisite: ENG 203 or ENG 204.

**ENG 321 Cultures in Contact (3-0-3).** Introduces the ways in which language and culture influence human interaction in a variety of cultural and interpersonal contexts. Covers a broad range of topics, including perception differences, worldview, identity, verbal and nonverbal styles of communication, and the effect of bias and conflicting value systems on cross-cultural

communication. Prerequisite: ENG 203 or ENG 204.

**ENG 331 The Sound Patterns of Language (3-0-3).** Examines the nature of the rules governing the sound system of language with special emphasis on English. Introduces the study of the physiology of speech production and phonetic transcription through practical exercises. Examines inflectional and derivational rules in language and word formation processes. Prerequisite: ENG 223 or ENG 224.

**ENG 332 The Psychology of Language (3-0-3).** Explores the relationship between language and the mind. Examines processes involved in comprehension, production and acquisition of language, and introduces research techniques and linguistic data collection. Prerequisite: ENG 203 or ENG 204.

**ENG 334 Meaning in Language (3-0-3).** Introduces various approaches to the study of meaning in language, examining linguistic reference and truth conditions of linguistic signs and expressions. Explores inferential strategies, presuppositions and speech acts in human communication, and situational context determining language use. Prerequisite: ENG 223 or ENG 224 or ENG 234.

**ENG 372 English and Globalization (3-0-3**). Discusses the role of English in globalization processes. Examines how the use of global English in education, the workplace and society transforms local cultures and affects national languages and identities. Prerequisite: ENG 203 or ENG 204.

**ENG 382 Language Variation in Media (3-0-3).** Studies texts from different media types to examine variation in English based on text-type, genre, register, and ideological and social backgrounds. Introduces corpus-based research methodologies. Prerequisite: ENG 223 or ENG 224 or ENG 234.

**ENG 385 Language and Gender (3-0-3).** Examines the reasons behind the differences in men's and women's talk. Explores how categories of language influence one's belief about one's self and others and the ways in which gendered language use relates to power and dominance in society. Prerequisite: ENG 223 or ENG 224 or ENG 234.

**ENG 401 Advanced English Grammar (3-0-3).** Provides an intensive investigation into contemporary English sentence structure, function and meaning. Analyzes how structure types and sentence relationships are realized in various texts and genres. Discusses issues relative to descriptive/ prescriptive approaches to language. Prerequisite: ENG 223 or ENG 224.

**ENG 405 Discourse Analysis (3-0-3).** Looks at the interpretation of meaning situated beyond the level of the sentence. Examines the role of notions such as background knowledge, cohesion and coherence in texts and conversational interaction in order to achieve a better understanding of how language works as a communication medium. Prerequisite: ENG 223 or ENG 224.

**ENG 490 Senior Research Project (3-0-3).** Focuses on the study of a literary movement/literary writer or qualitative/quantitative investigation of a linguistics issue of the student's and professor's choice. Includes the writing of a long critical paper/creative work/response to a specific literary problem, or reporting research findings in a journal article-length paper. Prerequisite: senior standing.

**ENG 495 Seminar in English (3-0-3).** Focuses on various topics in English language or English literature. The focus of the course is specified at the offering time. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications. Prerequisite: junior standing.

## English Literature

**ENG 185 Playing with Texts (3-0-3).** Introduces disciplines associated with the study of English. Explores linguistic, literary and rhetorical topics through viewing and analyzing short texts, such as real-world texts, songs, poems, films, short stories and graphics texts. Restricted to students with less than 45 credit hours. Prerequisite: EPT score of 4 or ELPT score of 1 or WRI 001, or placement into WRI 101.

**ENG 210 Introduction to Literature (3-0-3).** Focuses on the study of fiction, poetry and drama and shows how writers use the basic elements of their craft to convey insights into human conditions. Prerequisite: ENG 203 or ENG 204.

**ENG 214 Seventeenth to Nineteenth Century American Literature (3-0-3).** Examines American literature from the colonial period to 1900, concentrating on the philosophical, social and political issues that shaped various American writers. Prerequisite: ENG 203 or ENG 204.

**ENG 215 Contemporary World Literature (3-0-3).** Introduces contemporary literary movements such as modernism, magic realism, feminism, regionalism and postmodernism. Examines the works of major international writers. Focuses on works written in or translated into English. Prerequisite: ENG 203 or ENG 204.

**ENG 300 Introduction to Literary Theory (3-0-3).** Highlights a variety of 20th century critical practices and theoretical approaches to the study of literature. Offers practical applications of the theoretical texts under examination. Prerequisite: ENG 210 or ENG 214 or ENG 215 or ENG 310 or ENG 311.

**ENG 301 Creative Writing (3-0-3).** Introduces the basic elements of writing and evaluating poetry, fiction and creative non-fiction. Requires the submission of at least 20 pages of material suitable for inclusion in the student literary magazine. Prerequisite: ENG 203 or ENG 204.

**ENG 303 Shakespeare's Plays (3-0-3).** Examines works by Shakespeare. Covers Shakespeare's histories, romances, comedies and tragedies within the context of the politics, history and culture of his time. Prerequisite: ENG 203 or ENG 204.

**ENG 308 British Literature Until 1600 (3-0-3).** Surveys English and related literatures from the Anglo-Saxon period through Shakespeare. Studies texts in the context of their social, political and historical influences. Prerequisite: ENG 203 or ENG 204.

**ENG 309 British Literature: 1600–1800 (3-0-3).** Examines the transition in literature and thought from the Jacobean Age to the Enlightenment and the beginning of Romanticism. Prerequisite: ENG 203 or ENG 204.

**ENG 310 Nineteenth Century British Literature (3-0-3).** Surveys British poetry, prose and drama in the 19th century. Studies representative texts in relationship to their social, political and historical background. Prerequisite: ENG 203 or ENG 204.

**ENG 311 Twentieth Century British Literature (3-0-3).** Focuses on 20th century British poetry and prose, examining the causes of the rise of modernism and the subsequent development of post-modernism, as well as the persistence of traditional forms such as realism and fantasy. Prerequisite: ENG 203 or ENG 204.

**ENG 314 Twentieth Century American Literature (3-0-3).** Examines American literature from 1900 to the present, concentrating on the philosophical, social and political

issues that shaped the work of writers. Discusses the changing form and content of American fiction, drama, poetry and essay, as well as relevant literary theories. Prerequisite: ENG 203 or ENG 204.

**ENG 315 East Meets West: Colonial and Post-Colonial Encounters (3-0-3).** Examines the representations of the Middle East, India, China and North Africa in the works of North American and European writers. Addresses the responses to and representations of Westerners by non-Western writers. Prerequisite: ENG 203 or ENG 204.

**ENG 316 Modern Drama and Beyond (3-0-3).** Introduces developments in drama from the modern period to the present. Exposes major literary developments in drama such as realism, theater of the absurd, epic theater and various types of experimental and contemporary theater. Prerequisite: ENG 203 or ENG 204.

**ENG 378 Literature as Film (3-0-3).** Uses literary works and their cinematic adaptations to introduce film theory ideas and their parallel techniques in literature. Prerequisite: ENG 203 or ENG 204.

**ENG 393 Shakespeare on Film (3-0-3).** Uses an interdisciplinary approach (incorporating English literature and media/film studies) to teach how to synthesize elements of film theory and literary criticism and incorporate them into a series of research papers. Prerequisite: ENG 203 or ENG 204.

**ENG 410 The American Novel (3-0-3).** Examines the styles and concerns of the American novel from the 19th century to the present and includes representative examples of such national and international literary movements as romanticism, realism, modernism, postmodernism and magic realism, with particular emphasis on how American novelists adapted these styles to suit their own society and culture. Prerequisite: ENG 210 or ENG 214 or ENG 215 or ENG 314.

**ENG 421 Early English Novel (3-0-3).** Traces the development of the novel from its rise in the early 18th century to its flowering in the great realistic novels of the 19th century. Prerequisite: ENG 210 or ENG 215 or ENG 308 or ENG 309.

**ENG 430 Modern British Novel (3-0-3).** Examines trends in the 20th century British novel, including such literary movements as realism, modernism and postmodernism. Prerequisite: ENG 210 or ENG 215 or ENG 310 or ENG 311.

**ENG 490 Senior Research Project (3-0-3).** Focuses on the study of a literary movement/literary writer or qualitative/quantitative investigation of a linguistics issue of the student's and professor's choice. Includes the writing of a long critical paper/creative work/response to a specific literary problem, or reporting research findings in a journal article-length paper. Prerequisite: senior standing.

**ENG 495 Seminar in English (3-0-3).** Focuses on various topics in English language or English literature. The focus of the course is specified at offering time. Consult the online course catalog or the online class schedule accessible via the AUS student information system to verify course classifications. Prerequisite: junior standing.

## ENV Environmental Science

**ENV 100 Principles of Environmental Science (3-0-3).** Introduces the basic principles of environmental science. Explores the scientific method, structure of matter, energy principles, ecological concepts, organism interactions, communities and ecosystems, population dynamics, energy sources, biodiversity, human activities and the environment, managed ecosystems, water management, air quality and solid waste management. Not open to engineering and science students.

**ENV 150 Introduction to Environmental Sustainability (3-0-3).** Introduces the basic concepts of environmental sustainability. Employs the UN Sustainable Development Goals as a structure to discuss environmental aspects of society's development in regards to economic and social considerations. Covers concepts such as human population growth, biodiversity conservation, food, water and energy security, and waste management. Prerequisite: CHM 101 or CHM 104 or ENV 100.

**ENV 201 Fundamentals of Environmental Science (3-0-3).** Combines ideas and information from chemical, physical and biological disciplines. Provides information on how nature works and how environmental systems are interconnected. Employs scientific laws, principles and concepts to help understand environmental and resource problems and their possible solutions. Makes connections between natural systems and environmental issues using different physical science perspectives. Presents information that will ultimately be related to real-world environmental problems. Prerequisite/concurrent: CHM 102.

**ENV 252 Environmental Chemistry (3-0-3).** Investigates in detail the interaction between natural systems and human activity. Emphasizes the following topics: aquatic chemistry, with special attention paid to water pollution and water treatment; atmospheric chemistry, with emphasis on air pollution, protection of the atmospheric environment and global atmosphere problems; soil chemistry; and sources and treatment of hazardous wastes. Explores local and regional pollution problems in detail. Prerequisite: CHM 215.

**ENV 261 Physical Geography (3-0-3).** Covers the physical aspects of the geographic environment. Includes topics such as cartography and geographic information systems, the global energy balance, air temperature and pressure, atmospheric moisture content and precipitation, global wind circulation, weather systems, earth materials, forming and weathering processes, water cycling, fluvial processes and landforms. Prerequisite: CHM 101 or PHY 101.

**ENV 311 Environmental Modeling (3-0-3).** Deals with the study, collection, evaluation and interpretation of data and the modeling and analysis of urban and environmental problems. Includes topics such as population, pollution, mass transportation systems and climate modeling. Prerequisites: ENV 201 and MTH 104.

**ENV 352 Environmental Toxicology (3-0-3).** Combines principles of chemistry, biochemistry, biology and environmental science. Discusses the basic principles of environmental toxicology, including toxicant fate, bioavailability and biochemistry; dose-response relationships, toxicity testing, and species sensitivity distributions; and individual, population and community effects. Covers briefly principles of risk assessment and risk management of toxicants. Prerequisites: CHM 215, and ENV 201 or ENV 252.

**ENV 353 Soil and Water Chemistry (2-3-3).** Deals with the development of soil/water chemistry. Includes modern analysis methods for humic substances, minerals, particulates and pollutants in the soil. Covers topics such as mineralogy, soil solution, ion exchange/sorption, water acidity, wetlands and redox processes in aerobic soils and nitrogen transformations. Addresses a variety of analytical techniques that are commonly used in soil and water analysis. Prerequisite: ENV 252. Lab/Tech fee rate B applies.

**ENV 354 Assessment and Management of Environmental Impacts (3-0-3).** Addresses the impact of human activities on the ecosystem. Discusses ethical and legal dimensions of environmental impacts. Considers how environmental assessment results provide a basis for comparing various management options that enable decision makers. Not open to students who have completed ENV 411 or ENV 412. Prerequisite: ENV 100 or ENV 201.

**ENV 451 Waste Treatment (3-0-3).** Introduces the modern concepts of solid and liquid waste treatment. Covers sources and classifications of hazardous waste and their transport in the environment; hazardous waste management problems; physical, chemical and biological waste treatment processes; waste minimization; and analysis systems for regional planning. Prerequisites: ENV 252 and junior standing.

**ENV 453 Environmental Monitoring and Analysis Techniques (2-3-3).** Covers sampling, storage, preservation and analytical techniques critical in obtaining quality data for environmental monitoring of pollutants in each component of the environment. Stresses the interrelationship of these components and their importance to ecosystems along with the difficulties in environmental sampling. Provides standard methods for the examination of environmental samples and applies them in practical application for all compartments of the environment. Prerequisites: CHM 345, ENV 201 or ENV 252, and STA 201. Lab/Tech fee rate B applies.

**ENV 491 Senior Research Project (0-6-3).** Investigates in depth an environmental problem within the context of an independent research project. Involves literature search followed by field and laboratory studies. Evaluates scientific, ethical and legal dimensions of the problem investigated. Requires attendance and commentary on related seminars and tests on assigned topics as well as the presentation of results in both oral and thesis formats. Prerequisite: senior standing. Lab/Tech fee rate B applies.

**ENV 497 Internship in Environmental Science (0-0-0).** Requires a minimum of five weeks of approved applied work in environmental aspects with a governmental, municipal or private organization. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator. Registration fee applies.

## GEO Geography

**GEO 201 World Cultural Geography (3-0-3).** Provides a broad survey of the cultural geography of the world. Addresses cultural systems, agriculture and natural resources, urbanization, industrialization, development and political geography, among other topics. Prerequisite/concurrent: WRI 102.

## HIS History

**HIS 204 Modern Arab History (3-0-3).** Studies the history of the modern Arab world focusing mainly on the history of the region from 1800 and the changes that began to take place at that time. Concentrates on four aspects of the region's transformation: the experience of imperialism and colonialism, modernity, nationalism and the development of the modern state system. Prerequisite: WRI 102.

**HIS 205 World History I: Ancient and Medieval Worlds (3-0-3).** Surveys selected human societies of the ancient and medieval world, concentrating on their internal developments and cross-cultural contacts. Examines the rise of cities, organization of complex societies, the evolution of technology, advancements in agriculture, the evolving conduct of warfare, and the emergence of world religions. Prerequisite: WRI 101.

**HIS 206 World History II: The Modern World (3-0-3).** Surveys a global selection of themes and developments in the early modern and modern eras: the intensification of long-distance trade and migration, imperialism, political and economic revolutions, the rise of the nation-state, global conflicts, transformations in societies, and the impact of these changes on local and global cultures. Prerequisite: WRI 101.

**HIS 208 Women in History (3-0-3).** Comparatively surveys women's history from antiquity to the present in Europe and the Middle East. Aims to examine the lives, achievements, contributions and position of women historically, as well as to introduce the methodology of women's history, the sources for the study of women and the theories that provide the framework for the research and writing of women's history. Prerequisite: WRI 102.

**HIS 210 The Making of Modern Europe (3-0-3).** Introduces modern European history by exploring the key events and trends that have shaped Europe from 1789 to the present. Investigates the French Revolution, the Industrial Revolution, European imperialism, the development of nationalism, the First World War, the Russian Revolution, the rise of fascism, the Second World War, the Cold War, the collapse of the Soviet Union and development of the European Union. The course will also focus on the key social, demographic and cultural trends that have redefined European life in the 19th and 20th centuries. Prerequisite: WRI 102.

**HIS 212 Modern Japanese History (3-0-3).** Surveys the history of Japan from its beginnings to today. Briefly outlines Japan's earliest times, and then focuses on the period after the mid-1500s and the first contact with Europeans, the Edo Era (1600–1868), with major discussion of the history of economic, social, cultural, political and foreign policy developments from 1868 to the present day. Prerequisite: WRI 102.

**HIS 215 The Making of Modern Southeast Asia (3-0-3).** Introduces the history of Modern Southeast Asia (Indonesia, Thailand, Singapore, Malaysia, Vietnam, Cambodia, the Philippines, Myanmar and Laos). Explores the impact of colonialism upon the region by investigating not only the role of imperial powers, but also the ways in which colonial administrations affected indigenous populations. Focuses on the emergence of nationalism in the 20th century and its role in anti-colonial movements. Examines regional development in the context of the Cold War. Exhibits the success of ASEAN in wake of the Asia crisis of 1997. Prerequisite: WRI 102.

**HIS 217 The World in the 20th Century (3-0-3)**. Surveys the events of the long 20th century from a global perspective. Examines high imperialism, the fall of traditional empires, the rise of the nation-state, global industrialization, the emergence of socialism, totalitarian experiments, the world wars and the Cold War, decolonization, the rise of non-state actors and globalization of culture. Prerequisite: WRI 102.

**HIS 221 History of Science and Technology (3-0-3).** Studies the development of scientific thought and methodology from ancient Greece to the modern era. Covers topics such as contributions of China, Islamic lands and Europe; the surge of French and 17th century English science; and the influence of science on patterns of thinking and behavior. Touches upon diverse areas such as the histories of astronomy, nuclear energy, chemistry and forensics, as well as life and environmental sciences. Prerequisite/concurrent: WRI 102.

**HIS 222 African History since 1800 (3-0-3).** Surveys key events and themes in the history of sub-Saharan Africa since 1800. Covers the pre-colonial, colonial and post-colonial eras. Addresses topics such as the slave trade and abolition, nation-building, the creation and consolidation of colonial systems, and decolonization. Prerequisite: WRI 102.

**HIS 240 Introduction to American History (3-0-3).** Surveys the history of North America with a particular emphasis on the United States of America from the first European settlements to the present day. Covers interactions with Native Americans, slavery, the foundation of government, the Civil War and its aftermath, immigration, the emergence of the US as an industrial power, the US' role as an international power in the 20th century, social movements including those for civil and women's rights, the Cold War and its consequences, and the present situation of the US in the world. Prerequisite: WRI 102.

**HIS 307 Modern Palestinian History (3-0-3).** Examines Palestinian history before 1948 and brings the story forward to the breakthrough Oslo Accord of 1993 and its troubled aftermath. Focuses primarily on the origins and key aspects of the Arab-Israeli conflict. Prerequisites: WRI 102 and junior standing.

**HIS 308 Ottoman History (3-0-3).** Examines the social and economic history of the Ottoman Empire from its inception in 1924. Covers Ottoman expansion and governmental consolidation in the 16th and 17th centuries, including imperial foreign policy towards the Safavids and Europeans. Discusses the increasing political and economic influence of Europe during the 18th and 19th centuries in the context of the loss of Ottoman Europe and the Tanzimat reforms. Examines the rise of nationalist movements among many of the Empire's inhabitants and the impact of World War I. Prerequisite: any 200 level History course.

**HIS 310 Modern Gulf History (3-0-3).** Introduces the history of the Gulf Arab states in the 19th and 20th centuries. Examines the traditional economy of the Gulf before oil, traditional forms of rulership, the traditional role of merchants, British involvement in the region and the impact of oil in the first half of the course. Surveys the individual histories of the six Gulf Arab states in the second half of the course. Prerequisites: WRI 102 and junior standing.

**HIS 311 America and the Middle East (3-0-3).** Traces the connections between the United States and the Middle East from the first official contacts between the "Barbary Pirates" and the Jefferson Administration to the present. Examines the political, social and cultural implications of America's contacts with the region. Discusses the role of Middle Eastern states in the early years of the nation, the influence of American missionaries and schools, and the formation of the Modern Middle East. Analyzes America's changing approach to the region and the evolution of American interests and methods over the course of the 20th and 21st centuries. Prerequisite: HIS 204 or HIS 206 or HIS 217 or HIS 240.

**HIS 312 Modern Iranian History (3-0-3).** Introduces the history of modern Iran in the 19th and 20th centuries. Focuses on the political and social transformation of Iran under the influence of European imperialism and popular protest movements. Examines the roles of constitutionalism, modernity and nationalism in the development of the Qajar and Pahlavi monarchies, and the Iranian Revolution of 1978–1979. Prerequisite: ENG 203 or ENG 204.

**HIS 340 History of the Family (3-0-3).** Explores the transformation of family life and family structures in a specific historical context. Examines the family as an economic, political and social entity, and as a gendered network. Analyzes the relationship between family/kinship structures and socio-economic/socio-political developments. Covers key concepts and different methodological approaches employed in the field of family history. Prerequisite: ANT 205 or any 200 level History course or WST 240.

## INS International Studies

**INS 120 Global Problems (3-0-3).** Introduces students to a range of global issues such as economic and political globalization, security and development. Explores different disciplinary and theoretical approaches to understanding global issues. Considers the impact of global problems at the local, national, regional and international levels and evaluates the response of both government and non-government organizations. Prerequisite/concurrent: WRI 101.

**INS 140 Oil and Energy in the Contemporary World (3-0-3).** Introduces key issues related to oil and other energy resources in the contemporary world. Examines the impact of energy resources on global problems such as economic development, conflict and security. Employs country-specific case studies to explain the importance of energy sources. Prerequisite: WRI 101.

**INS 300 Research Design and Source Analysis (3-0-3).** Introduces skills required to develop evidence-based arguments, such as research design, the ability to analyze primary and secondary source material, and use of both quantitative and qualitative evidence. Examines how concepts, models and theories can be utilized in research design. Explores the research process including development of a thesis statement, literature searches and review, as well as how to write effective introductions and conclusions. Prerequisites: INS 120, STA 202, WRI 102, and ANT 205 or HIS 206 or HIS 208 or HIS 217 or POL 201 or SOC 201.

**INS 301 Globalization (3-0-3).** Examines the process of globalization, which is well underway at all levels of society with sociopolitical impacts on all cultures. Introduces the globalization of economic systems, multinational organizations, technological, consumerism and worldwide communication systems. Prerequisite: ANT 205 or HIS 206 or HIS 217 or POL 201 or SOC 201.

**INS 307 International Security (3-0-3).** Provides a broad introduction to contemporary security studies. Surveys some of the major concepts and theories in the area of international security and explores their application to a variety of case studies. Addresses issues such as inter-and intra-state conflict, non-state actors, asymmetrical warfare, nuclear proliferation, just war theory, techniques of diplomacy and cooperation. Prerequisite: POL 202.

**INS 320 Human Rights in World Politics (3-0-3).** Analyzes the global politics and history of the conception, protection and violation of human rights. Presents analytical frameworks, concepts, dominant theories and empirical methods used in the study of human rights. Examines how democracy and democratization, international law and institutions, the activities of powerful democracies, and global civil society each influence human rights around the world. Incorporates perspectives from the disciplines of political science, law, economics and history. Prerequisite: ANT 205 or HIS 217 or PHI 208 or POL 201 or SOC 201.

**INS 322 Global Political Economy (3-0-3).** Analyses the evolution of the global political economy from the launching of the Bretton Woods system to the present. Focuses on the interplay between politics and economics as it impacts finance, globalization, international supply chains, development strategies, debt crises and

the tension between protectionism and free trade. Prerequisites: ECO 202, HIS 217, INS 300 and POL 202.

**INS 325 Imperialism (3-0-3).** Explores the origins, development and consequences of modern imperialism. Surveys the key patterns that have defined the growth and expansion of modern empires. Uses case studies of concrete historical situations to provide students with a detailed look at how empires grow and develop. Investigates the disparities between different patterns of decolonization and their respective legacies. Prerequisite: HIS 206 or HIS 217 or POL 201.

**INS 330 Women and Politics (3-0-3).** Examines the involvement of women in formal and informal politics from a global perspective. Addresses different forms of women's political activism and their impact. Focuses on developments and issues within individual countries through case studies. Prerequisite: ANT 205 or HIS 208 or POL 201 or WST 240 or WST 250.

**INS 340 Fascism and the Populist Radical Right in Europe (3-0-3).** Examines the rise and fall of fascism and populist radical right parties in Europe. Explores what fascism is and why some European states became fascist. Analyzes the causes for the rise of new radical right parties in several European countries. Evaluates the difference and commonalities between populist radical right parties. Prerequisite: HIS 206 or HIS 210 or HIS 217 or POL 201.

**INS 350 Moot Court (3-0-3).** Introduces fundamentals of advocacy before international tribunals. Covers analysis of legal precedents, the development of legal briefs and the structure of oral arguments. Focuses on the skills required for analytical legal thinking. Repeatable up to 6 credit hours; the second registration will be used towards free electives. Prerequisites: BLW 301 or MCM 321 or PHI 201 or POL 201, and permission of instructor.

**INS 365 Disease and Disaster in History (3-0-3).** Examines the impact of disease and disaster on human society in global historical contexts. Explores how individuals and societies have conceptualized disease and disaster constructs and how they have attempted to confront them. Prerequisite: ANT 205 or any 200 level History course.

**INS 400 Ethnic Politics in the Developing World (3-0-3).** Examines the historical origins and contemporary dynamics of ethnic politics in the developing world. Surveys different theoretical approaches to the study of ethnic conflict, as well as the impact of colonialism on ethnic identities, and the legacy of decolonization on nationalist movements in the developing world. Examines a number of post-independence challenges faced by multiethnic states through the use of case studies. Prerequisite: POL 202.

**INS 413 Political Economy of the Arab World (3-0-3).** Surveys the political economic trajectories of selected states in the Arab world, paying special attention to the politics, societies and ideological currents of the Eastern (Mashreq) Arab world. Explores themes such as the process of post-colonial state formation, the rise of Arab nationalism and other forms of proto-nationalisms, variations in regime consolidation and state-society relations, the institutional structures of authoritarianism, the challenges of economic restructuring and political liberalization, and the Islamist challenge. Prerequisites: ECO 202 and POL 202.

**INS 414 Political Economy of the Asia Pacific Region (3-0-3).** Explores political, economic, social and environmental issues in the Asia Pacific Region, which includes South, Southeast, East and Northeast Asia; Australasia; and the Pacific littoral states of North, Central and South America. Places special emphasis upon the efforts of regional cooperation organizations and lessons to be gleaned by the states of Southwest Asia and the Middle East. Prerequisites: ECO 202, and INS 301 or INS 322 or POL 300 or POL 304.

**INS 415 War and Peace in the Middle East (3-0-3).** Examines inter-state conflict, and efforts to negotiate peace in the Middle East. Gives special attention to the interaction between the Arab-Israeli conflict, regional rivalries, the policies of the main international powers, and domestic politics in shaping regional dynamics. Some of the topics covered include the Arab-Israeli Wars, the different Gulf Wars and the Arab-Israeli peace process. Prerequisite: POL 202.

**INS 420 Social Theory (3-0-3).** Explores social theory. Discusses the central texts in social theory including positivism in the 19th century and the debates in the late 20th century. Examines the critique of social theory from a variety of perspectives. Prerequisites: ENG 203 or ENG 204, and PHI 201 or POL 201 or SOC 201, and junior standing.

**INS 490 Senior Research Project (3-0-3).** Focuses an independent capstone research project involving global issues or problems, in conjunction with an academic supervisor. Considers theoretical approaches in disciplines related to the Bachelor of Arts in International Studies degree program. Restricted to BAIS students. Prerequisites: INS 322 and senior standing.

**INS 497 Internship in International Studies (0-0-0).** Involves applied work in international studies with businesses, a government organization or private agencies. Admission to the class must be approved by the student's advisor. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator. Registration fee applies.

## MCM Mass Communication

**MCM 101 Digital Video Skills I (3-1-3).** Introduces basic skills for creating video content for digital storytelling, such as videography, camera techniques, lighting and sound techniques and editing techniques. Restricted to BAMC students. Lab/Tech fee rate A applies.

**MCM 102 Introduction to Media Literacy (3-0-3).** Provides an introduction to the history of the media and media creation. Makes comparisons and explores relationships among visual arts, music and oral, written and technological media. Considers the role of art, myth, music and the forces that helped foster their development. Restricted to students with less than 60 credit hours. Not open to BAMC students. Prerequisite/concurrent: WRI 102.

**MCM 150 Introduction to Mass Communication Studies (3-0-3).** Examines the nature of the various areas of the mass media, (i.e., television, radio, newspapers, magazines and interactive outlets) and how they impact the individual and society. Prerequisite/concurrent: WRI 102.

**MCM 217 Cyberculture and Identities (3-0-3).** Examines the rapid growth of cyber-cultures and the formation of online identities. Explores the role that online platforms play as sites of cultural production and the range of meanings and identities produced within these platforms. Assesses the disruptive role that online cultures and identities may be playing in the ongoing existence of real-world cultures and the formation of traditional identities. Prerequisite: ENG 203 or ENG 204.

**MCM 219 Global Media (3-0-3).** Explores media and communication technologies, systems and practices in a global context using both historical

and comparative perspectives. Analyzes the development, patterns and implications of cinematic, television, digital, and social media production and consumption on a global scale. Prerequisite: ENG 203 or ENG 204.

**MCM 222 Principles of Integrated Marketing Communications (3-0-3).** Explores the essential issues shaping contemporary communication practice including direct-response advertising, media technology, communication planning, sales, public relations and event marketing. Prerequisite: MCM 231; prerequisite/concurrent: MKT 201.

**MCM 225 Theories of Mass Communication (3-0-3).** Provides a broad survey of legacy and emerging media and mass communication theories. Explores the everyday application of these theories in a variety of professional contexts including journalism, integrated marketing communications and social media. Prerequisite: MCM 150.

**MCM 231 Writing for Mass Communication (3-0-3).** Introduces the specific forms of writing for the mass media including print and broadcast news stories, the basics of digital storytelling and various forms of copy for integrated marketing communication. Prerequisite: MCM 150.

**MCM 275 Principles of Journalism (3-0-3).** Introduces basic principles of journalism as a profession and journalistic storytelling as it occurs in a variety of media formats. Discusses the history of journalism, legal and ethical concerns, and relevant media theory. Prerequisite/concurrent: MCM 231.

**MCM 307 Film Criticism (3-0-3).** Introduces film genres, film noir, polyphonic narrative, comedy, romance and verities, among other topics, and critical approaches to analyze cinematic text. Covers exploration, discussion, research and writing about films as well as screenplay texts. Addresses theoretical approaches such as semiotics and structuralism, feminist, psychoanalytic, formalist and social criticism. Prerequisite: MCM 231.

**MCM 309 Social Media for Mass Communication (3-0-3).** Focuses on social networking, micro-blogging and web applications employed in the fields of journalism, public relations, advertising and related media. Addresses ways in which social networking tools can be used to communicate and share information. Considers the legal and ethical implications associated with the use of social media for mass communication. Prerequisites: MCM 231 and junior standing. Lab/Tech fee rate A applies.

**MCM 310 Infographics for Journalism (3-1-3).** Introduces the principles of visual representation of information. Examines techniques of information graphics and digital visualizations, the use of charts, maps, diagrams and illustrations to tell stories. Explores ways to create compelling graphical displays of evidence and to critically evaluate examples from print media and the Internet. Prerequisites: MCM 222 or MCM 275, and MCM 231. Lab/Tech fee rate A applies.

**MCM 311 Mass Communication Research Methods and Data Analytics (3-0-3).** Surveys qualitative and quantitative research methods in social sciences and the humanities with a focus on the mass media, journalism and integrated marketing communications. Covers the basics of generating and understanding social media analytics. Explores strategies to develop a research question, and design, conduct, implement and evaluate mass communication research projects using traditional and new data collection instruments. Prerequisites: MCM 225 and STA 202. Lab/Tech fee rate B applies.

**MCM 320 Intercultural Communication (3-0-3).** Provides an overview of world cultural literacy and shows how cultures influence communication. Enables the acquisition of knowledge about the interrelation of the humanities, music, mythology, art, theater, history and science. Prerequisite: ENG 203 or ENG 204.

**MCM 321 Mass Communication Law and Ethics (3-0-3).** Examines global legal issues affecting mass communication practices in advertising, journalism and public relations. Introduces professional ethical theory and decision making, and corporate social responsibility. Prerequisite: MCM 222 or MCM 275.

**MCM 322 Case Studies in Integrated Marketing Communications (3-0-3).** Explores and analyses case studies in integrated marketing communications. Emphasizes branding, database marketing, ethics, search engine optimization, paid search, B2B and B2C marketing, multichannel marketing, multicultural marketing, social media marketing and mobile marketing. Prerequisite: MCM 222.

**MCM 323 Multiplatform Media Planning (3-0-3).** Examines the convergence of media and integrated marketing communications planning and buying across multiple traditional media and digital, mobile and social media platforms. Emphasizes research, planning, budgeting, writing and execution of multiplatform plans with multiple objectives and strategies driven by market data, media databases and syndicated consumer research. Prerequisite: MCM 222.

**MCM 326 Content Creation for Integrated Marketing Communications (3-1-3).** Introduces essential skills in the production of content for integrated marketing communications, including written, audio, video, infographics and social media content. Stresses the integrated production of integrated marketing communications content within a digital storytelling format. Prerequisite: MCM 222. Lab/Tech fee rate A applies.

**MCM 329 Mass Communication and Society (3-0-3).** Provides an overview of the effect of media on the formation of communities and societies through the mass media's formation of the audience and the audience's use of the mass media. Explores how media reflect and mold culture. Examines the role the media play in creating "the global village." Discusses the role that the Internet and social media platforms play in the formation of new communal and societal formations. Prerequisite: MCM 225.

**MCM 360 Crisis and Conflict Communication (3-0-3).** Focuses on media and communication centric approaches to crisis and conflict management. Combines theoretical concepts and best practices in communicating and covering crisis and conflict in different social and multicultural settings and situations. Explores various methods of planning for executing effective conflict and crisis communication strategies. Prerequisites: MCM 222 or MCM 275, and MCM 225.

**MCM 371 News Writing (3-0-3).** Builds expertise in newswriting and journalistic storytelling for text platforms. Gives concentrated practice in news gathering, note taking, interviewing and writing articles. Prerequisite: MCM 275.

**MCM 374 Feature Writing (3-0-3).** Examines various storytelling techniques in long-form journalism. Focuses on traditional and digital formats and skills specific to news features, personality profiles, issue-oriented articles and human-interest stories. Prerequisite: MCM 275.

**MCM 376 Writing for Magazines (3-0-3).** Introduces the various techniques in magazine writing. Focuses on different formats specific to magazine writing. Analyzes the elements of a magazine including readership, writing style and tone. Prerequisite: MCM 275.

**MCM 377 Photojournalism (3-0-3).** Teaches the use of a digital single lens reflex camera to take photos for reportage and digital storytelling. Covers technical issues including lens settings, shutter speed, lighting, exposure compensation and composition. Includes assignments covering all major photojournalism digital storytelling formats. Prerequisite: MCM 222 or MCM 275. Lab/Tech fee rate B applies.

**MCM 378 Literary Journalism (3-0-3).** Provides an overview of the literary journalism genre. Explores the intersection of journalism and literature, the overlap of fiction and non-fiction, through pioneering works. Enhances reporting and information-gathering skills, and demonstrates how real stories can be told and adapted in an engaging way. Prerequisite: ENG 203 or ENG 204 or MCM 231. Lab/Tech fee rate A applies.

**MCM 379 Journalism in the Arab Countries (3-0-3).** Focuses on theory and practice in Arab journalism. Explores historical and current challenges facing the Pan-Arab news media industry. Considers political, social, cultural, financial and technological factors that impact Arab journalism. Addresses finance, reach and impact. Prerequisite: MCM 225.

**MCM 381 Digital Storytelling for Journalists (3-1-3).** Focuses on digital storytelling techniques in broadcast journalism. Covers scripting formats, voice-overs and interviewing in radio and television news. Addresses how storytelling is applied to radio and TV news packages. Prerequisite: MCM 275. Lab/Tech fee rate A applies.

**MCM 392 Women and Film (3-0-3).** Examines issues pertaining to women and film such as, but not limited to, history of women's cinema, prominent women directors and genres, and social functions of film as it pertains to the role of women in society. Prerequisite: ENG 203 or ENG 204.

**MCM 424 Social Media Strategies (3-0-3).** Examines existing social media platforms and their use in effective social media integrated marketing communications campaigns. Analyzes key attributes, best practices and audience response measurements for each social media platform. Requires the design and development of a social media plan in response to a client brief. Prerequisites: MCM 322, MCM 323 and MCM 326.

**MCM 474 Field News Reporting (3-1-3).** Develops field newsgathering, interviewing and reporting skills for television, online and print. Prerequisites: MCM 371 and MCM 381. Lab/Tech fee rate A applies.

**MCM 479 Multimedia Journalism (3-1-3).** Examines multimedia storytelling in journalism. Emphasizes content production in multimedia formats. Focuses on the development of collaborative journalism skills in the production of a multimedia journalism project using text, audio, video, images and motion graphic elements. Prerequisite: MCM 474. Lab/Tech fee rate A applies.

**MCM 480 Critical Analysis of the Mass Media (3-0-3).** Examines the uses of critical theory and specific methodological approaches in the study of mass media. Considers sources of influence in society and the implications of media production and consumption. Prerequisite: MCM 311.

**MCM 485 Integrated Marketing Communication Campaigns (3-0-3).** Examines all aspects of integrated marketing communications (IMC) campaigns. Covers research, strategy planning, creative planning, media planning and pitching. Requires collaborative work focused on developing and executing an IMC campaign. Prerequisite: MCM 424.

**MCM 497 Mass Communication Internship (0-0-0).** Provides a minimum of five weeks (normally 240 hours) of on-the-job training and experience with a professional firm in either advertising creativity, sales, advertising media, writing and/or editing for print and/or electronic media. Students are expected to find their own placement for this requirement. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator. Registration fee applies.

## MTH Mathematics

**MTH 001 Preparatory Mathematics for Engineers (3-2-4).** Preparatory for MTH 103 Calculus I. Emphasizes the basic skills and techniques of algebra and trigonometry. Explores real and complex numbers, basic arithmetic, equations and inequalities, study of functions, polynomial and rational functions, exponential and logarithmic function, trigonometric functions and introduction to limits. Students are allowed to repeat a preparatory course up to Sophomore I standing (less than 45 credit hours).

**MTH 002 Preparatory Business Mathematics (3-0-3).** Preparatory for MTH 101 and MTH 102. Covers integers and variable expression, fractions, decimals and real numbers, basic algebraic operations, equations and inequalities, functions and graphs, polynomial, rational, exponential and logarithmic functions with emphasis on business applications. Students are allowed to repeat a preparatory course up to Sophomore I standing (less than 45 credit hours).

**MTH 003 Preparatory Mathematics for Architects (3-0-3).** Preparatory for MTH 111 Mathematics for Architects. Covers basic ideas and concepts of arithmetic, algebra, geometry and trigonometry and calculus applications needed for architecture and design. Students are allowed to repeat a preparatory course up to Sophomore I standing (less than 45 credit hours).

**MTH 100 Fundamentals of Logic and Geometry (3-0-3).** Covers logic and set theory, geometry in the plane and space, and basic algebra. Includes the following topics: fundamentals of inductive and deductive reasoning; propositional and first order logic; sets, relations and functions; Euclidean and analytical geometries in two and three dimensions; and linear transformations and quadratic forms. Not open to BArch, BID, engineering, science and SBA students.

**MTH 101 Mathematics for Business (3-0-3).** Covers coordinate systems and graphs, matrices, linear systems and applications, elementary linear programming, set theory, counting techniques, permutations and combinations, introduction to probability, and the mathematics of finance. Emphasizes techniques and applications. Prerequisite: MTH 002 or any AUS math placement test, or SAT Subject Test–Math level 1 or level 2 with a minimum score of 600.

**MTH 102 Calculus for Business (3-0-3).** Covers the derivative, rules for differentiation and their applications, definite and indefinite integrals, methods of integration and applications, functions of more than one variable, partial differentiation and applications to optimization. Emphasizes techniques and applications. Not open to science or engineering students. Prerequisite: MTH 002, or SAT Subject Test–Math level 1 or level 2 with a minimum score of 600.

**MTH 103 Calculus I (3-1-3).** Covers inverse functions, limits of functions; differentiation of algebraic, logarithmic, exponential, trigonometric and inverse trigonometric functions; applications of derivatives including maxima and minima, related rates, approximations, theory of integration with applications including areas and volumes. Includes a computer laboratory component. Not open to BSDM, BSMD and BSVC students. Prerequisite: MTH 001 or Engineering Math Placement Test, or SAT Subject Test–Math level 1 or level

2 with a minimum score of 600. Lab/Tech fee rate A applies.

**MTH 104 Calculus II (3-1-3).** Covers techniques of integration, hyperbolic functions, improper integrals, arc length, surface area, infinite series, power series, convergence tests, parameterized curves, polar coordinates, integration in polar coordinates and complex numbers. Prerequisite: MTH 103.

**MTH 111 Mathematics for Architects (3-0-3).** Introduces the topics of geometry and calculus needed for architecture. Reviews trigonometry, areas and volumes of elementary geometric figures, and the analytic geometry of lines, planes and vectors in two and three dimensions. Covers differential and integral calculus, including applications on optimization problems, and areas and volumes by integration. Restricted to CAAD students. Prerequisite: MTH 001 or MTH 003 or Architecture Math Placement Test or Engineering Math Placement Test, or SAT Subject Test–Math level 1 or level 2 with a minimum score of 600.

**MTH 113 Introduction to Arab/Islamic History of Mathematics (3-0-3).** Explores the contributions of Arab/Muslim scholars to the main classical themes of mathematics. Covers the historical development of algebra, arithmetic, combinatorics, number theory, geometry and trigonometry. Restricted to students with less than 60 credit hours. Prerequisite/concurrent: WRI 101.

**MTH 203 Calculus III (3-1-3).** Covers calculus of functions of several variables, vectors and analytic geometry of three-dimensional space, partial derivatives, gradients, directional derivatives, maxima and minima, multiple integrals, line and surface integrals, Green's theorem, divergence theorem and Stokes' theorem. Includes a computer laboratory component. Prerequisite: MTH 104.

**MTH 205 Differential Equations (3-0-3).** Covers mathematical formulation of ordinary differential equations, methods of solution and applications of first order and second order differential equations, power series solutions, solutions by Laplace transforms and solutions of first order linear systems. Prerequisite: MTH 104.

**MTH 211 Geometry for Art and Architecture (3-0-3).** Introduces the relation between geometry and architecture. Focuses on the use of geometrical concepts in art and architecture. Includes the following topics: sculpture and ancient Greek geometry; Egyptians and the geometry of the pyramids; basic geometric constructions; use of proportion in art, symmetry and isometry; Euclidean geometry; and polygons. Not open to science and engineering students. Prerequisite: MTH 100 or MTH 102 or MTH 103 or MTH 111.

**MTH 213 Discrete Mathematics (3-0-3).** (Equivalent to CMP 213). Covers propositional and predicate calculus, sets, major classes of functions and related algorithms, asymptotic analysis of functions, principle of mathematical induction, proof techniques, recursive definitions, counting, relations, graphs and trees. Computer science and computer engineering students who are not yet formally admitted to the second-year level in the major are not eligible to take this course. Prerequisite: MTH 102 or MTH 103.

**MTH 221 Linear Algebra (3-0-3).** Covers systems of linear equation, algebra of matrices, linear transformations, determinants, vector spaces, inner product spaces, eigenvalues and eigenvectors, diagonalization and orthogonality, special matrices and applications. Prerequisite: MTH 104.

**MTH 243 Introduction to Mathematical Programming (0-2-1).** Introduces the idea of algorithms and procedures. Expose students to basic logic, conditional statements and iterative commands used in writing computer algebra system codes to solve selected mathematical problems. Prerequisite: sophomore standing.

**MTH 304 Mathematics of Finance (3-0-3).** Covers interest measurement, pricing of annuities (due, immediate, increasing, decreasing, geometric, with payments frequency smaller than the compounding period), amortization schedule and sinking fund method (with different remunerative and reproductive rate), yield rate, bonds (pricing, book value, market value, flat price, bound amortization schedule, callable bounds) and term structure of interest rates. Prerequisite: MTH 102 or MTH 103 or MTH 111.

**MTH 305 Life Contingencies (3-0-3).** Provides a basic review of interest theory, life tables and population problems, life annuities (due, immediate, temporary, deferred, increasing, decreasing) with basic pension application, life insurance (pure endowment, term insurance, deferred insurance, n-year endowment insurance, varying), net single premium, annual premium and statistical considerations. Prerequisites: MTH 102 or MTH 103 or MTH 111, and STA 201 or STA 202 or NGN 111 or QBA 201.

**MTH 307 Theory of Risk (3-0-3).** Covers probabilistic notions related to risk theory, individual and collective risk models for a short term, compound processes and approximations, collective risk for an extended period, applications to insurance, stop-loss insurance reinsurance, dividends in group insurance, reinsurance and probability of ruin, surplus and loss process, and ruin theory. Prerequisites: MTH 102 or MTH 103 or MTH 111, and STA 201 or STA 202 or NGN 111 or QBA 201.

**MTH 311 Intermediate Analysis (3-0-3).** Covers sets and the real number system, functions, mathematical induction, sequences and series, limits and continuity, uniform continuity, basic topology of the real number system, differentiation, Riemann-Stieltjes integration, sequences and series of functions and uniform convergence. Prerequisites: MTH 203, MTH 213 and MTH 221.

**MTH 312 Advanced Calculus (3-0-3).** Focuses on the study of vector calculus including vector fields, the theory of integration of functions of two and three variables, divergence and Stokes' theorems, the inverse and implicit function theorems. Addresses the basic topology of Euclidean space, continuity and differentiation of vector valued functions, linear operators on Euclidean space, and curves and surfaces. Prerequisite: MTH 203.

**MTH 313 Number Theory and its Applications (3-0-3).** Covers the Euclidean algorithm, linear congruencies and the Chinese Remainder Theorem, Fermat's Little Theorem, quadratic residues and quadratic reciprocity, Pythagorean triples and sums of squares. Includes applications in communication, public key cryptography, computer arithmetic, random number generators and music. Prerequisite: MTH 203 or MTH 213 or MTH 221.

**MTH 320 Abstract Algebra I (3-0-3**). Covers semi-groups, monoids, groups, permutation groups, cyclic groups, Lagrange's Theorem, subgroups, normal subgroups, quotient groups, (external) direct product of groups, homomorphism and isomorphism theorems, Cayley's Theorem, and introduction to rings and fields. Prerequisite: MTH 221.

**MTH 325 Coding Theory (3-0-3).** Introduces coding theory, linear codes, Hamming codes, Hamming distances, Hamming weights, probability, Shannon's theorem, dual codes, weight distribution of linear codes, cyclic codes, BCH codes, convolution codes, encoding and decoding. Prerequisite/concurrent: MTH 221.

**MTH 330 Fundamental Concepts of Geometry (3-0-3).** Describes elementary theory in foundations of geometry and logical systems, and basic theory in the fields of Euclidean, non-Euclidean and synthetic coordinate projective geometry, including homogeneous coordinates. Prerequisite: MTH 103 or MTH 111.

**MTH 343 Numerical Analysis I (3-0-3).** Introduces the fundamentals of numerical algorithms and their application for scientific computing. Includes topics such as error analysis, root finding, interpolation, function approximations, integration and differentiation, initial value problems, optimization techniques and linear programming. Prerequisites: CHE 240 or CMP 120 or CVE 211 or MCE 226L or MTH 243, and MTH 221.

**MTH 350 Introduction to Probability (3-0-3).** Introduces probability spaces, axioms of probability, combinatorial counting techniques for discrete probability spaces, conditional probability and independent events; random variables, univariate and multivariate probability density functions expectation; variance and higher moments and moment generating functions. Prerequisite: STA 201; prerequisite/concurrent MTH 203.

**MTH 351 Methods of Applied Mathematics (3-0-3).** Introduces a broad range of mathematical tools used to solve scientific and engineering problems. Includes the following topics: Fourier analysis, integral transforms, calculus of variation, special functions and coordinate systems. Discusses applications problems, including mechanical structures, electrical circuits, fluid mechanics, continuum mechanics and geometry. Prerequisite: MTH 205.

**MTH 360 Probability and Stochastic Processes (3-0-3).** Covers set theory, preliminaries of probability theory and random variables, stochastic processes, spectral characteristics, Markov chains and applications to systems. Prerequisites: NGN 111 or STA 201, and ELE 323 or MTH 312 or MTH 351 or prerequisite/concurrent: ELE 321.

**MTH 382 Linear Programming and Optimization (3-0-3).** Introduces optimization theory and methods, nonlinear unconstrained optimization, linear programming, sensitivity analysis, various algorithms and search methods for optimization and their analysis. Provides examples from various disciplines. Prerequisites: MTH 221, and MTH 243 or CHE 240 or CMP 120 or CVE 211 or MCE 226L.

**MTH 412 Complex Variables (3-0-3).** Studies functions of a complex variable, algebra of complex numbers, elementary functions with their mapping properties, analytic functions, power series, integration, Cauchy's Theorem, Laurent series and residue calculus, elementary conformal mappings and boundary value problem. Prerequisite: MTH 203.

**MTH 418 Graph Theory (3-0-3).** Covers graphs and sub graphs, connected and disconnected graphs, matrices, trees and girth, planar and nonplanar graphs, graph embeddings, connectivity and edge connectivity, Hamiltonian graphs, matching, factorization and coverings, networks and applications to science and engineering. Prerequisite: MTH 213 or CMP 213.

**MTH 420 Abstract Algebra II (3-0-3).** Introduces group homomorphisms and isomorphism, classification of Abelian finite groups, Sylow theorems, ring homomorphisms, factorization of polynomials, unique factorization domains, field extensions and, in particular, cyclotomic field extensions and Galois's theory. Prerequisite: MTH 320.

**MTH 431 Dynamical Systems (3-0-3).** Examines the second order differential equations in phase plane, linear systems and exponential operators, canonical forms, stability of equilibria. Lyapunov functions, autonomous systems, the existence of periodic solutions and applications to various fields. Prerequisites: MTH 205 and MTH 221.

**MTH 432 Partial Differential Equations (3-0-3).** Covers mathematical formulations and solutions of partial differential equations of physical problems, includes the wave, heat and Laplace's equation. The mathematical tools include Fourier transform, Fourier series and Laplace transform. Prerequisite: MTH 205.

**MTH 443 Numerical Analysis II (3-0-3).** Introduces techniques and concepts of numerical analysis. Includes the following topics: direct and iterative methods for solving linear systems, and numerical methods for non-linear system of equations, initial and boundary value problems and partial differential equations. Prerequisite: MTH 343.

**MTH 490 Senior Project (0-6-3).** Provides individualized study in which a student conducts research on a topic not specifically covered in other courses under the supervision of a faculty member with expertise in that area. Prerequisites: senior standing and consent of instructor.

## MUS Music

**MUS 100 Elements of Music (3-0-3).** Covers the fundamentals of music production, notation, instrumentation, form, historical time periods, "classical" and "popular" styles, and significant musical figures. Examines the history of music and its influence on different cultures. Addresses the development of written and listening skills in music theory.

**MUS 101 Class Voice and Music Notation (2-1-3).** Focuses on sight-singing and written skills in the framework of Western music. Addresses the relationship between theory and the practical understanding of musical construction. Covers notation, harmonic and melodic analysis and ear training while using the human voice.

**MUS 102 Oud and Buzuk Class (2-1-3).** Explores basic oud/busuk technique in a classroom/oud studio environment. Covers music theory topics such as finger numbers, note reading, rhythm, dynamics, legato/staccato, key signatures, intervals and rests, among others. Introduces a variety of simple oud/buzuk pieces.

**MUS 170 Class Piano I (2-1-3).** Studies basic piano technique in a classroom/piano studio environment. Covers music theory topics such as finger numbers, note reading, rhythm, dynamics, legato/staccato, key signatures, intervals and rests, among others. Introduces a variety of simple piano pieces.

**MUS 200 Introduction to European Classical Music (3-0-3).** Introduces the history and development of music within the European Classical tradition and its impact on culture worldwide. Examines the chronological development and the factors involved in the evolution of musical thought and experience. Prerequisite: WRI 102.

**MUS 202 Survey of World Music (3-0-3).** Studies music as a world phenomenon with emphasis on its relationship to culture, indigenous customs, function and significance. Focuses on important figures, instruments and theories, but equally on music's ethical and social dimensions. Prerequisite: WRI 102.

**MUS 203 Introduction to Arabic, Turkish and Persian Classical Music (3-0-3).** Introduces the history and development of music within the Arabic, Turkish and Persian classical music traditions. Examines the chronological development and factors involved in the evolution of musical thought and experience. Prerequisite: WRI 102.

**MUS 252 Applied Lessons (0-3-1).** Provides individual lessons with special focus on one instrument. Explores basic pedagogy of selected instrument. Studies repertoire to establish a foundation of basic techniques. Repeatable up to 3 credit hours. Prerequisite: audition with instructor.

**MUS 255 Music Ensemble (0-3-1).** Provides group ensemble activities. Explores basics of music theory and direct application in a public performance. Repeatable up to 3 credit hours. Prerequisite: audition with instructor.

**MUS 270 Class Piano and History (2-1-3).** Studies intermediate piano technique in a classroom/piano studio environment. Covers music theory topics such as intermediate-difficulty rhythm patterns, detailed study of keys and key signatures, types of chords and chord progressions, and harmonization. Explores historic contributions to development of music by various composers. Prerequisite: MUS 170 or audition with instructor.

**MUS 302 Women and the Performing Arts (3-0-3).** Examines women's musical and theatrical contributions in a variety of capacities and traditions. Researches the history of women in the performing arts as composers, performers (on stage and film), patrons, and symbols in the marketing and consumption of the arts. Prerequisite: ENG 203 or ENG 204.

**MUS 352 Advanced Applied Lessons (0-3-1).** Studies directly under supervision of a professor in individual lessons with special focus on one instrument at a higher level of expertise and greater degree of difficulty. Repeatable up to 3 credit hours. Prerequisite: audition with instructor.

**MUS 355 Advanced Music Ensemble (0-3-1).** Rehearses ensemble activities in advanced level groups. Explores complex music theory and direct application in a public performance. Repeatable up to 3 credit hours. Prerequisite: audition with instructor.

**MUS 356 Musical Theatre and Performance (2-1-3).** Develops musical theatre skills through analysis, rehearsal and performance of musical theatre repertory. Employs rehearsal and performance techniques used in professional production. Prerequisite: audition with professor.

**MUS 377 Piano Literature (3-0-3).** Explains the major currents in music history through the study and analysis of the keyboard repertoire of major composers. Addresses the key characteristics of the main genres found in keyboard repertoire. Covers the socio-cultural context that influenced major composers and their works. Prerequisite: MUS 200 or MUS 202 or MUS 270.

**MUS 470 Chamber Music with Piano I (2-1-3).** Studies and applies basic chamber music with piano technique through compulsory individual weekly coaching sessions and lessons. Develops the student's abilities and potential on the art of making music together with other students. Includes weekly studio class, jury evaluation and studio recital. Prerequisites: MUS 200 or MUS 202 or MUS 270, and consent of instructor based on audition. Lab/Tech fee rate A applies.

## PHI Philosophy

**PHI 201 Introduction to Philosophy (3-0-3).** Introduces basic questions, ideas and methods of philosophy. Discusses philosophers selected from various historical periods. Encourages and teaches the development of a philosophical mind. Prerequisite: WRI 102.

**PHI 202 Introduction to Islamic Philosophy (3-0-3).** Surveys the major philosophers in Islam, focusing on religious doctrines interacting with philosophical traditions. Discusses the relationship between Islamic and Western philosophy. Prerequisite: WRI 102.

**PHI 204 Ethics for Professionals (3-0-3).** Examines the ethical character of professional life. Develops a background for ethical judgment, and awareness of one's own viewpoint. Both historical sources and contemporary case studies may be used. Not open to BSCS students. Prerequisite: WRI 102.

**PHI 206 Ethics and Information Technology (3-0-3).** (Equivalent to CMP 235). Examines the ethical questions raised by our life with information technology. Develops a background for ethical judgment, and awareness of one's own viewpoint. Both historical sources and contemporary case studies may be used. Prerequisite: WRI 102.

**PHI 207 Existentialism (3-0-3).** Examines the development of the various schools of Existentialist thought through an examination of its crucial texts in 19th century and 20th century thought. Explores central questions to existentialist thought such as: What does it mean to say that existence precedes essence? What is the nature of human freedom? What does it mean to be an authentic human being? Prerequisite: WRI 102.

**PHI 208 Modern Philosophy (3-0-3).** Introduces the basic ideas and institutions that define "modernity" within Western culture. Traces modernity as a cultural and philosophic paradigm from the Protestant Reformation until Heidegger and the postmodern turn. Focuses on the development of the modern subject as key to understanding the ideas and institutions of the Enlightenment. Prerequisite: WRI 102.

**PHI 303 Political Philosophy (3-0-3).** Introduces the fundamental questions of how a polity should be structured. Emphasizes the justifications for fundamental decisions in shaping political orders. Both historical and contemporary readings apply. Prerequisite: ENG 203 or ENG 204.

**PHI 304 Themes in Western Thought (3-0-3).** Explores selected themes from the history of Western thought with relevance in the present. Makes clear how ideas shape culture and inform life far into the future. Emphasizes the relationship between Western thought and the students' lives. Prerequisite: ENG 203 or ENG 204.

**PHI 305 Advanced Social Political Philosophy (3-0-3).** Concentrates on advanced issues in social political philosophy and offers a normative approach to social political issues from a historical perspective that allows students to understand better contemporary debates. Concentrates on a specific issue (e.g., equality, personal liberty, human rights, property rights, etc., depending on the year and instructor) and explores its significance in detail. Prerequisite: PHI 303.

**PHI 306 Philosophy of Law (3-0-3).** Surveys the philosophical issues associated with law. Considers issues relating to the natural law approach in Aquinas to later 20th century interpretations. Analyzes the positivist and realist approaches to law. Explores the relationship between law and morality, constructivism, and criticisms of the law by Marxists and others. Prerequisite: PHI 201 or PHI 202 or POL 201 or BLW 301 or ECO 326.

**PHI 309 Ethics and the Environment (3-0-3).** Explores the philosophical dimensions of how we are related to the environment. Studies why, or whether, life on Earth should be respected. Reflects on the philosophy of nature. Prerequisite: ENG 203 or ENG 204.

**PHI 310 Islamic Political Philosophy (3-0-3).** Introduces the history of Islamic political thought. Covers political philosophy in the first centuries of Islam, and the relationship

between the temporal and the religious. Surveys the relationship between Islamic political thought and modernity in the 19th and 20th centuries. Examines the development of political Islam in the 20th century. Addresses contemporary debates concerning the relationship between politics and Islam in the Islamic and non-Islamic worlds. Prerequisite: PHI 201 or PHI 202 or ENG 203 or ENG 204 or POL 201.

## PHY Physics

**PHY 001 Preparatory Physics (3-0-3).** Develops problem-solving skills using algebra and trigonometry through the study of elements of kinematics (motion in one and two dimensions) and dynamics (Newton's laws, momentum, work and energy). Required for science and engineering students with an insufficient background in physics. Students are allowed to repeat a preparatory course up to Sophomore I standing (less than 45 credit hours).

**PHY 100 Conceptual Physics (3-0-3).** Gives non-science and non-engineering majors an understanding of the basic concepts of physics without complex mathematics. Emphasizes conceptual understanding of physical phenomena, firmly grounded in the scientific methods. Covers simple elements of mechanics, waves and light, electricity and magnetism, atoms and nuclei. Not open to engineering and science students.

**PHY 101 General Physics I (3-0-3).** Introduces the fundamental principles, laws and concepts of mechanics to students of science and engineering. Covers mechanics (kinematics in one and two dimensions; Newton's laws of motion with applications; work and energy; conservation of energy and momentum; general rotation, including torque and angular momentum; static equilibrium) as well as some introductory material on and mechanical waves (simple harmonic motion). Prerequisite: PHY 001 or Physics Placement Test; prerequisites/concurrent: MTH 103 and PHY 101L.

**PHY 101L General Physics Laboratory I (0-3-1).** Provides the opportunity to perform experiments that demonstrate the principles and laws of mechanics. Includes experiments on kinematics; Newton's laws of motion with friction and other forces; work and energy; conservation of momentum; rigid body rotational inertia; torque; static equilibrium; and simple harmonic motion. Prerequisite/concurrent: PHY 101. Lab/Tech Fee rate A applies.

**PHY 102 General Physics II (3-0-3).** Builds upon General Physics I. Covers electricity (electric fields, including Gauss's law; electric potential; capacitors and resistors; DC circuits), magnetism (sources of the magnetic field, including Ampere's law; induction, including Faraday's law and Lenz's law), and alternating current circuits, as well as introductory material on electromagnetic waves. Prerequisites: PHY 101 and PHY 101L; prerequisite/concurrent: PHY 102L.

**PHY 102L General Physics Laboratory II (0-3-1)**. Focusses on experiments that illustrate the basic principles of electricity and magnetism. Covers the charge of the electron, electric field mapping, Ohm's law, Wheatstone bridge, power transfer, Kirchhoff's rules, resistor-capacitor circuit, force on a current-carrying wire in a magnetic field, magnetic field due to a circular loop, and the charge-to-mass ratio of the electron. Prerequisite/concurrent: PHY 102. Lab/Tech Fee rate A applies.

**PHY 103 Astronomy (3-0-3).** Presents a broad view of descriptive astronomy without complex mathematics. Introduces and familiarizes the students with basic astronomical facts and phenomena that one can observe, study and explain using scientific methods. Consists of studying the night sky, using celestial coordinates, understanding the motion of heavenly bodies, familiarizing oneself with the tools of astronomers, reviewing the solar system, understanding what stars are and how they evolve, and getting a general overview of galaxies and the universe. Not open to engineering and science students.

**PHY 104 Physics for Architects (3-0-3).** Teaches selected set of algebra-based topics in physics to students of architecture. Topics covered Include: elements of mechanics (kinematics and dynamics); optics (geometrical as well as interference); sound (including general principles of acoustics, such as the propagation, transmission, attenuation and reverberation of sound); heat and energy. Not open to engineering and science students and to students who have completed PHY 101. Prerequisite/concurrent: MTH 101 or MTH 103 or MTH 111.

**PHY 106 General Physics III (3-0-3).** Covers fluid mechanics (pressure, buoyant force, the continuity equation and Bernoulli's equation), basics of oscillatory motion (simple harmonic motion and damped and forced oscillations), mechanical waves (waves on a string, sound waves, the Doppler effect, standing waves, resonance and beats), thermodynamics (temperature, heat and heat engines, the laws of thermodynamics and the kinetic theory of gases), and light and optics (laws of geometric optics, image formation and basics of interference). Prerequisites: PHY 101 and PHY 101L.

**PHY 106L General Physics III Laboratory (0-3-1).** Comprises a selected set of experiments illustrating the principles, laws and concepts discussed in PHY 106. Includes experiments on fluid mechanics (buoyant force and viscosity), oscillatory motion (simple pendulum and the mass-spring system), mechanical waves (speed of sound), thermodynamics (specific heat and thermal expansion of metals) and optics (laws of reflection, Snell's law, the spherical mirror and lens-maker's equations and Young's double-slit experiment). Prerequisite/concurrent: PHY 106. Lab/Tech Fee rate A applies.

**PHY 113 Introduction to Astrophysics (3-0-3).** Introduces the fundamental principles, laws and concepts of astrophysics. Applies the laws of mechanics, optics, thermodynamics and modern physics, including relativity and nuclear reactions, to the planets, stars and galaxies and their physical phenomena. Provides a technical overview of the satellites, telescopes and other astronomical instruments and techniques. Prerequisites/concurrent: PHY 101 and MTH 103.

**PHY 200L Intermediate Physics Laboratory (0-3-1).** Covers intermediate-level experiments focused on fluid mechanics, waves, thermodynamics, optics and photoelectric effect. Addresses Frank-Hertz and Young's double-site experiments. Prerequisites: PHY 106 and PHY 201. Lab/Tech fee rate A applies.

**PHY 201 Modern Physics (3-0-3).** Covers special relativity, introductory quantum mechanics, nuclear physics, elements of solid state and semi-conductor physics. Addresses the fundamental principles of quantum mechanics, including de Broglie's wave assumption, Heisenberg's uncertainty principle, quantization and wave function. Prerequisites: PHY 102 and PHY 102L.

**PHY 203 Introduction to Electronics (2-3-3).** Introduces the diffusion process and operating principles of semiconductor devices in analog and digital electronics. Covers the underlying physics and applications of direct and alternating current circuits, filters, diodes, transistors, amplifiers and digital logic concepts. Prerequisite: PHY 201. Lab/Tech fee rate A applies.

**PHY 232 Properties of Matter (3-0-3).** Provides a thorough and technical overview of the physical properties of matter to students with a background in basic physics. Includes the following topics: states of matter, classes of materials, atomic bonding, structural properties of matter, X-ray diffraction, experimental diffraction methods (simulation), imperfections in solids, atom movements and diffusion, mechanical properties of matter and electrical properties of matter. Prerequisites: PHY 102 and PHY 102L.

**PHY 301 Energy Sources (3-0-3).** Covers energy from a physics perspective. Examines present and future alternative energy sources, including hydroelectric, nuclear, solar, geothermal and tidal energy. Investigates the problems caused by each energy source and the issue of sustainability. Prerequisites: PHY 102 and PHY 102L.

**PHY 303 Atmospheric Physics (3-0-3).** Deals with applications of thermodynamics, radiation theory, optics and mechanics to atmospheric phenomena: composition, origin and structure; atmospheric processes; extra-tropical synoptic scale disturbances; cloud microphysical processes; radiation transfer and trapping; energy balance; and atmospheric dynamics. Prerequisites: PHY 102, and PHY 106 or CHM 102 or CHE 214 or MCE 241.

**PHY 305 Modern Optics and Lasers (3-0-3).** Focuses on ray and wave optics and laser physics. Covers the propagation of light (waves, phase and group velocities, and the Doppler Effect), the vectorial nature of light (electromagnetic fields, the Poynting vector, polarization, reflection and refraction), coherence and interference, optical spectra and light amplification (stimulated emission, population inversion and lasers). Prerequisite: PHY 201.

**PHY 310 Mathematical Methods in Physics (3-0-3).** Introduces mathematical techniques and methods employed in classical mechanics, electromagnetism, quantum mechanics and fluid mechanics with particular emphasis on applications to physical problems. Explores applications of Fourier and Laplace transforms. Focuses on the use of computer software to solve physics problems. Prerequisites: PHY 102 and MTH 205. Lab/tech fee rate A applies.

**PHY 313 Satellites and Space Physics (3-0-3).** Covers contemporary developments, discoveries and trends in space science and technology. Emphasizes the relevance and application of various physical principles and laws (mechanics for orbits and electromagnetism for communication, signal detection and processing, energetics, and image processing for remote sensing, etc.) Focuses on practical applications and tools related to satellites and space physics. Prerequisites: PHY 102 and PHY 102L.

**PHY 320 Classical Mechanics (3-0-3).** Covers topics in Newtonian mechanics including kinematics and dynamics in one, two and three dimensions. Addresses analytical mechanics including generalized coordinates, Lagrange's and Hamilton's equations, and theory of small oscillations. Prerequisites: PHY 101 and MTH 205.

**PHY 330 Electromagnetic Theory (3-0-3).** Covers the principles and applications of electromagnetic theory and optics. Emphasizes charges and currents, electric and magnetic fields; dielectric, conducting and magnetic media; and relativity, Maxwell equations, wave propagation in media, radiation and scattering. Prerequisites: PHY 102 and MTH 203.

**PHY 350 Quantum Mechanics (3-0-3).** Covers wave mechanics, Hilbert space, angular momentum and spin, symmetries and identical particles. Surveys techniques for solving the Schrodinger equation exactly and by approximation methods. Explores applications of quantum mechanics to a number of quantum processes in atomic, molecular, nuclear and condensed matter physics. Prerequisite: PHY 201; prerequisite/concurrent: PHY 310. Lab/Tech fee rate A applies.

**PHY 397 Internship in Physics (0-0-0).** Requires a minimum of five weeks of approved applied work in physics-related organization, laboratory, agency or firm. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator. Registration fee applies.

**PHY 400L Contemporary Experimental Physics (0-6-2).** Provides an overview of advanced experimental techniques and analysis. Focuses on data acquisition, data reduction, error analysis and technical writing skills. Addresses techniques in atomic, molecular and solid-state spectroscopy. Covers applications of VIS-NIR light, X-rays, and gamma rays in classical and modern physics experiments. Prerequisites: PHY 203 and PHY 350. Lab/Tech fee rate A applies.

**PHY 401 Physics of Semiconductors (3-0-3).** Covers the basics of semiconductor devices. Provides a general introduction to semiconductors (crystal structures, crystal symmetry, crystal growth techniques), carrier modeling (band structures, effective masses, density of states, carrier distribution, and carrier concentration), carrier action (mobility, resistivity, band bending, diffusion, recombination), pn junction diodes (build-in potential, step-junctions, boundary value solution using Poisson's equations, I-V characteristics) and optoelectronic devices (solar cells and LEDs). Designed for students with a thorough understanding of general physics and some exposure to quantum phenomena. Prerequisite: PHY 201.

**PHY 460 Thermodynamics and Statistical Physics (3-0-3).** Examines the statistical basis of thermodynamics. Covers energy and the first law of thermodynamics; states, entropy and the second law of thermodynamics; thermodynamics relations; statistical methods for microscopic systems; the partition function; and quantum statistics. Explores applications of statistical physics to various physical systems and phenomena. Prerequisites: PHY 106, PHY 201 and PHY 310.

**PHY 491 Senior Research Project I (0-6-3).** Requires faculty-supervised individual or group projects on specific topics of current interest in physics. Focuses on structuring a research project and requires oral presentations and written reports. Prerequisites: PHY 350, and ENG 203 or ENG 204.

**PHY 492 Senior Research Project II (0-6-3).** Requires faculty-supervised individual or group projects on specific topics of current interest in physics. Focuses on structuring a research project and requires oral presentations and written reports. Prerequisites: PHY 350, and ENG 203 or ENG 204.

## POL Political Science

**POL 201 Introduction to Political Studies (3-0-3).** Introduces the science of politics and the study of the structure of government. Examines the institutions and theories underpinning modern nation-states, primarily focusing on the subfields of political theory and comparative politics. Prerequisite: WRI 102.

**POL 202 Introduction to International Relations (3-0-3).** Introduces the main stages of the evolution of international relations as a discipline since 1945, which can be seen as an ongoing debate about the explanatory value of one particular theory (Realism). Covers theories of international relations as well as a theory-based introduction to foreign policy analysis. Analyzes the different schools of international relations theory

as well as their respective critiques. Prerequisite: POL 201.

**POL 208 Introduction to American Government (3-0-3).** Surveys American government and examines the essential elements of the US political system. Covers such areas as the Constitution, Congress, the presidency, the judiciary and the electoral system. Discusses the nature of American democracy and examines such topics as federalism, culture, public opinion, political parties, interest groups, elections and the media. Prerequisite: WRI 102.

**POL 300 Comparative Politics (3-0-3).** Introduces key themes, theories and debates in comparative politics. Provides an overview of the historical, political, economic and ideational dynamics that have shaped the states and societies of the developed and developing worlds. Prerequisite: POL 201.

**POL 304 International Organizations (3-0-3).** Introduces the structure and function of international organizations and their role in economic, political, military, cultural or humanitarian relations among nation-states. Considers selected organizations such as the United Nations, North Atlantic Treaty Organization, International Monetary Fund and the World Trade Organization. Prerequisite: POL 202.

**POL 305 Public International Law (3-0-3).** Covers international law, including the Law of the Seas, the Geneva Convention, the Charter of the United Nations, crimes against humanity, environmental law, international and regional treaties and trade agreements. Focuses on legal institutions such as the International Court of Justice in The Hague. Prerequisite: POL 202.

**POL 308 American Foreign Policy (3-0-3).** Examines the evolution and impact of American foreign policy. Studies the major issues in past and current US foreign policy, with a focus on the historic debates that have shaped American international conduct and their relevance to today's politics. Studies the processes of American foreign policy and examines the various factors in both the domestic and international contexts that have shaped and currently shape foreign policy initiatives. Gives particular attention to the sources of basic American policies during the past half century, along with a focus on the various theoretical approaches to explanation. Examines the pressing issues of today, particularly those pertaining to the Middle East and the West. Prerequisites: POL 201, and POL 202 or POL 208.

**POL 309 The American Political System (3-0-3).** Covers the American political system, its constitutional framework, its principles and practice. Focuses on the constitutional system of separated powers and checks and balances, and examines the dynamics of American politics, the interaction between its various political actors, and the relationships between the institutions of the presidency, congress and courts as "rivals for power." Prerequisite: POL 201 or POL 208.

**POL 310 The European Union and the Politics of Integration (3-0-3).** Analyzes the origins, development, politics and workings of the European Union along with major historical developments in European integration. Explores institutional theories as they apply to the Union, its political institutions and decision-making processes. Prerequisite: HIS 206 or HIS 210 or HIS 217 or POL 201.

**POL 408 Comparative Politics of the Middle East and North Africa (3-0-3).** Examines the political environment in the Middle East and North Africa, focusing on nation-states as units of analysis. Analyzes political interests, structures, and governmental and non-governmental institutions. Explores the characteristics of political systems such as identity politics, political development and political economy. Uses a comparative approach to the study of the Middle East and North Africa. Prerequisite: POL 300 or POL 304 or POL 305 or POL 307 or INS 301 or INS 307.

**POL 409 Politics and Civil Society in the Middle East (3-0-3).** Analyzes selected aspects of recent Middle Eastern politics including changes in its political culture, key institutions, political economy, religion, gender relations and civil activism. Examines recent theoretical developments in the literature and assesses empirical analyses of these topics. Prerequisite: POL 300 or POL 304 or POL 305.

## PSY Psychology

**PSY 101 Introduction to Psychology (3-0-3).** Introduces psychology as a scientific discipline with evidence-based methods for exploring human behavior and experience. Covers a variety of topics across various fields in psychology, such as research methods, biopsychology, consciousness, sensation and perception, genetics, development, learning, memory, intelligence, personality, mental illness, therapy and social psychology. Prerequisite/concurrent: WRI 101.

**PSY 102 Social Psychology (3-0-3).** Introduces the scientific study of social behavior and social influences on behavior. Focuses on the study of how our behaviors, thoughts and emotions are affected by the real or imagined presence of other people. Presents theories and research on such topics as attitude change and persuasion, stereotypes and prejudice, conformity and obedience to authority, altruism, conflict, interpersonal attraction and friendship. Prerequisite/concurrent: WRI 101.

**PSY 250 Research Methods I (3-0-3).** (Formerly PSY 210). Explores various psychological research methods that have transformed our understanding of human thought and behavior. Contrasts the most common methods and explores their strengths and limitations. Provides skills in seeking sources of scientific information, generating study materials, understanding statistical procedures and presenting research findings. Prerequisite: PSY 101.

**PSY 301 Abnormal Psychology (3-0-3).** Covers different theoretical approaches and empirical studies of causes, symptoms and treatment of abnormal behavior; problems and advantages of creating a classification scheme for abnormal behavior; the major diagnostic categories and review of the more common patterns of abnormal behavior; and how such disorders arise from subtle interactions between organic or psychological predisposition. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 302 Developmental Psychology (3-0-3).** Explores how human psychology changes over time. Considers various factors in development from conception until death, including biological, cognitive, social and cultural influences. Addresses development across the lifespan, from infancy to adulthood. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 303 Health Psychology (3-0-3).** Explores current research findings on how psychological and behavioral factors influence health and illness through a multidisciplinary approach drawing from psychology, sociology, anthropology and biology. Covers the impact of illness on the psyche. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 304 Personality Psychology (3-0-3).** Provides a comprehensive overview of the role of personality in psychology. Develops and engages the critical thinking skills that are

characteristic of behavioral scientists. Examines contemporary theories and explores the critique of social constructionists. Demonstrates the understanding of human behavior, drawing on phenomenology and personal construct theory. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 305 Cognitive Psychology (3-0-3).** Provides a comprehensive overview of the role of cognition in psychology. Develops and engages the critical thinking skills that are characteristic of behavioral scientists. Explores the basics of cognitive psychology through the coverage of cognitive neuroscience, attention and consciousness, perception, memory, knowledge representation, language, problem solving and creativity, decision making and reasoning, cognitive development and intelligence. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 306 Organizational Psychology (3-0-3).** Explores the psychology of organizations at the individual and group level using an evidence-based approach. Investigates a variety of topics related to organizations such as teamwork, leadership, motivation and performance evaluation. Emphasizes an understanding of research methods and data science in the context of organizations. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 309 Psychology of Bilingualism (3-0-3).** Explores psychological perspectives related to the ability to speak more than one language. Focuses on the impact of bilingualism on cognitive growth and development. Covers the neurological aspects of bilingualism and the impact that speaking, reading or writing in two languages has on the brain. Considers how the ability to speak more than one language alters perceptions of the world and consequently influences thinking. Prerequisites: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 311 Biopsychology (3-0-3).** Explores the physiology of behavior and experience. Examines core concepts in the field of biopsychology including but not limited to the anatomy and function of the human nervous system and the biological foundation of psychological processes. Examines recent research and theories regarding the impact of biological functions on behavior. Prerequisites: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201, and BIO 101 or BIO 103.

**PSY 312 Psychology of Creativity (3-0-3).** Provides a comprehensive overview of the psychological processes underlying creativity. Examines contemporary theories of creative persons, products and process. Explores creativity from cognitive, developmental, biological, clinical, social, educational and cultural perspectives. Illustrates these theories and perspectives with examples from art, literature and science. Prerequisite: PSY 250, or PSY 101 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 321 Cultural Psychology (3-0-3).** (Formerly PSY 308). Provides an overview of the role of culture in human thoughts, feelings and behaviors. Focuses on how psychological processes are shaped by the people and information that occupy an individual's living environment. Presents theories and research on such topics as human development, selfhood, motivation, cognition, emotion and social relationships. Prerequisite: PSY 250, or PSY 101 or PSY 102 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 322 Stereotypes, Prejudice and Discrimination (3-0-3).** (Formerly PSY 307). Introduces core concepts related to stereotyping, prejudice, discrimination, stigma and intergroup relations. Focuses on how perceiving other people as somehow different from ourselves can impact our thoughts, feelings and behaviors toward those people at very basic levels. Addresses how stereotypes are formed, maintained and changed; why prejudice exists and how it impacts society; and how people can try to control or change these processes. Prerequisite: PSY 250, or PSY 101 or PSY 102 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 323 Psychology of Religion (3-0-3).** Focuses on aspects of religiosity and spirituality that can be investigated scientifically. Explores connections between religiosity and social behavior, personal development, cognition, biological processes and relationships. Employs an evidence-based approach to identify factors that influence religious psychology and that are influenced by religious and spiritual experience. Addresses religiosity and spirituality as cross-cultural human practices. Prerequisite: PSY 250, or PSY 101 or PSY 102 and any one of STA 201, STA 202, NGN 111 or QBA 201.

**PSY 350 Research Methods II (3-0-3).** Explores advanced psychological research methods and links them to statistical analyses. Investigates sophisticated research designs such as between and within-subjects experiments, factorial designs, mediation, moderation, meta-analysis and clinical trials. Guides students through the steps of the experimental process, emphasizing background research, study design, material creation, data collection and presentation. Prerequisites: PSY 250 and ENG 204.

**PSY 351 Psychology Research Experience (3-0-3).** Provides hands-on experience in psychological research. Offers the opportunity to work with faculty in reviewing scientific literature, creating research materials, guiding participants through studies and analyzing data. Aims to produce results that can be submitted for publication in international scientific journals. Addresses techniques for lab organization and the promotion of research. Prerequisite: PSY 350.

**PSY 397 Internship in Psychology (0-0-0).** Provides an opportunity to apply psychological theories and research to professional experience in external organizations through a five-week (normally 240 hours) internship. Aims to improve administrative and relationship skills in professional settings. Aims to refine personal development goals and aspirations after graduation. Graded as Pass/Fail. Prerequisites: junior II standing and permission of the internship coordinator. Registration fee applies.

**PSY 403 Personal and Professional Development (3-0-3).** Focuses on the development of personal and professional goals using key concepts and research findings in psychology. Explores the connection between research in psychology and important post-graduate relationships in the home, workplace and community. Addresses the creation of strategies and materials for post-graduate employment. Restricted to BAPSY students. Prerequisites: PSY 350 and senior standing.

**PSY 404 History and Systems (3-0-3).** Explores major developments and ideas in the history of psychology as an academic discipline. Addresses such topics as the history of ideas about "the mind," key historical and social events that shaped the field, when and how psychology became a science, life histories of psychologists, and how ideas about what is "normal" shape and are shaped by psychology. Prerequisites: PSY 350 and senior standing.

**PSY 490 Research Design (3-0-3).** Focuses on the development of an empirical research project from the concept phase to the creation of materials and procedures with guidance from faculty supervisors. Culminates in a public presentation and defense of

the study design before a panel of psychologists and other human science researchers and practitioners. Restricted to BAPSY students. Prerequisites: PSY 350 and senior standing.

## SOC Sociology

**SOC 201 Introduction to Sociology (3-0-3).** Surveys the discipline and provides a foundation for other sociology courses. Introduces some of the major concepts, theories and research findings of sociology. Considers topics such as education, race and ethnicity, organizations, the mass media, poverty and social deviance. Prerequisite: WRI 102.

**SOC 210 Religion and Society (3-0-3).** Introduces a sociological approach to studying religion. Analyzes the interactions between religion and social environments, beliefs, practices and organizations. Explores processes by which individuals acquire and maintain religious beliefs and identities, and the role of religion among its members and within society. Prerequisite: WRI 102.

**SOC 220 American Society (3-0-3).** Examines how American society is shaped by such social forces as race, class and gender. Considers additional topics such as immigration past and present, social movements, citizenship and democracy, and social control and deviance. Prerequisite: WRI 102.

**SOC 230 Introduction to Chinese Culture and Society (3-0-3).** Introduces basic sociological perspectives on culture and social change. Examines the foundations of Chinese identity and elements of Chinese culture. Considers the impact of rapid social changes during the 20th century. Explores topics such as ethnicity, gender, marriage, family, population, religion, economy, education and social inequality. Discusses the Chinese diasporas. Prerequisite: WRI 102.

**SOC 302 Environmental Sociology (3-0-3).** Examines how societies adapt to and transform their physical environment. Considers topics such as sustainable development, environmentalism as a social movement, public policy and urban sprawl. Prerequisite: WRI 102.

**SOC 320 East Asian Societies (3-0-3).** Examines contemporary economic, political, social and cultural changes in East Asia, particularly in Mainland China, Taiwan, South Korea and Japan. Explores cultural similarities and variations within East Asia. Covers aspects of culture and religion, social stratification systems, marriage and family, education, economic development, political systems, popular culture, demographic changes and environmental problems in East Asia. Prerequisite: ANT 205 or GEO 201 or HIS 206 or HIS 212 or SOC 201 or SOC 220.

**SOC 370 Women's Empowerment and International Development (3-0-3).** Examines international development from a sociological perspective. Addresses the causes of women's deprivation by focusing on how global forces influence the political, social and cultural constructions of women's social role. Demonstrates an understanding of the roles of government and non-governmental organizations that seek to offer women's empowerment as strategy in international development. Prerequisite: ANT 205 or HIS 208 or POL 201 or SOC 201.

**SOC 380 Urban Sociology (3-0-3).** Explores changing urban life in different cultural, social and historical settings. Examines both classic and contemporary debates within urban sociology. Considers topics such as social segregation, urban planning, homelessness, urban development and public service delivery. Prerequisite: WRI 102.

## STA Statistics

**STA 201 Introduction to Statistics for Engineering and Natural Sciences (3-1-3).** Explores descriptive statistics, probability theory and random variables, discrete and continuous probability distributions, experimental design and sampling, estimation, hypothesis testing, correlation, simple and multiple regression analysis, goodness-of-fit tests and the use of statistical computer software. Not open to SBA students in the BSBA degree program or students in engineering majors excluding BSIE students. Not open to students who have completed STA 202 or NGN 111 or QBA 201. Prerequisite: MTH 103 or MTH 111. Lab/Tech fee rate A applies.

**STA 202 Introduction to Statistics for Social Sciences (3-1-3).** Introduces acquisition and development of statistical methods that are commonly used in social sciences. Methods covered include techniques for classification of data, descriptive statistics, discrete random variables and the normal probability distribution, sampling techniques and experimental design, estimation, hypothesis testing, goodness-of-fit tests, simple regression and correlation, and the use of statistical computer software. Not open to SBA students in the BSBA degree program or College of Engineering students. Not open to students who have completed STA 201 or NGN 111 or QBA 201. Prerequisite: MTH 100 or MTH 101 or MTH 103 or MTH 111. Lab/Tech fee rate A applies.

**STA 233 Introduction to Survey Sampling and Analysis (3-0-3).** Introduces acquisition and development of survey design, and survey analysis. Covers techniques for survey sampling such as simple random sampling, cluster, stratified, systematic, and simulation. Addresses the analysis of survey results including statistical estimation methods and the use of statistical computer software. Prerequisite: STA 201 or STA 202 or NGN 111 or QBA 201.

**STA 301 Foundations of Statistics for Data Science (3-0-3).** Introduces topics and techniques of statistical analysis used in the field of data science. Covers inference for population means and proportions and Chi-square tests. Addresses the design of experiments and observational studies. Covers simple and multiple regression, logistic regression, regression diagnostics and model selection, single factor and multifactor analysis of variance and multiple comparisons procedures. Prerequisite: STA 201 or STA 202 or NGN 111 or QBA 201.

**STA 401 Introduction to Data Mining (3-0-3).** Introduces the fundamentals of data mining and techniques used to analyze big data. Covers data cleaning, variable selection and transformation, data visualization techniques, dimensionality reduction, clustering, decision tree, neural networks, regression modeling, model comparison, association and sequence analysis. Prerequisites: CMP 120 or MIS 201, and STA 201 or STA 202 or NGN 111 or QBA 201. Lab/Tech fee rate A applies.

## THE Theatre

**THE 101 Theatre Appreciation (3-0-3).** Introduces fundamentals of theatre, history, plays, playwriting, movement and expression, acting and production. Explores the historical context of the development of Western Drama, and applies practical understanding of those elements. Explores theories related to each specific element.

**THE 102 Dramatic Process (3-0-3).** Explorers the speech, movement and improvisational techniques used to create dramatic expression and effective stage communication. Introduces the Stanislavsky system.

Includes interactive ensemble performances.

**THE 141 Stagecraft (3-0-3).** Presents lectures and classroom demonstrations in the construction, painting, lighting, handling of scenery, and the making of properties. Requires crew hours.

**THE 230 Dramatic Literature (3-0-3).** Examines fundamentals of theatre, plays, playwriting, movement and expression, acting and production through script analysis. Explores the historical context of the development of Western drama and applies practical understanding of those elements. Explores theories related to each specific element. Prerequisite: WRI 102.

**THE 242 Elements of Theatrical Design (3-0-3).** Covers the vocabulary of analytical tools theatrical designers use. Addresses color theory and picture plane composition, and discovers how the principles of two-dimensional and three-dimensional design impact the theatre artist. Contributes to development of department productions. Includes the construction of a 1/4" scale model based on the research and design choices of each student. Prerequisite: THE 101 or THE 102 or THE 141 or THE 251 or ARC 201 or ART 101 or ART 111 or DES 111.

**THE 245 Technical Theatre Laboratory (0-4-1).** Addresses the knowledge and skills necessary to work on backstage crews. Covers assembly and construction of set and prop pieces, hanging and focusing of lighting equipment. Studies the execution of lighting and sound plots, and theatrical ground plans. Includes running of live theatrical productions. Graded as Pass/Fail. Repeatable up to 3 credit hours. Prerequisite: permission of the instructor.

**THE 246 Costume Design (2-1-3).** Explores techniques in developing rendering skills for costume designs. Addresses basic skills in transforming renderings into plots, patterns and costume pieces. Prerequisite: THE 101 or THE 102 or THE 141 or permission of the instructor. Lab/Tech fee rate B applies.

**THE 251 Rehearsal and Performance (0-4-1).** Provides practical experience turning a dramatic script into a theatrical performance. Employs rehearsal and performance techniques used in professional production. Emphasize full development of character creation. Explores the role of the stage manager in full detail. Graded as Pass/Fail. Repeatable up to 3 credit hours. Prerequisite: consent of instructor based on audition.

**THE 253 Musical Theatre Production (6-0-3).** Provides experience in turning a musical script into a theatrical performance. Employs rehearsal and performance techniques used in professional production. Emphasizes study of texts, warm-up, reading, blocking, vocal study and development, audience-actor relationships, incorporation of director's guidance, the nuances of creating a character, analyzing a dramatic text, and stage management. Prerequisite: consent of instructor based on audition.

**THE 255 Voice and Movement (3-0-3).** Introduces the study, analysis and application of various styles of movement required in theatrical productions, and how the voice and body work as one. Studies body language, analysis of movement, types and rhythms of movement and pantomime. Prerequisite: THE 101 or THE 102 or THE 141 or THE 245 or THE 251.

**THE 301 Musical Theatre History (3-0-3).** Explores the history and development of the musical theatre genre. Covers playwriting structure and musical elements. Explores the genre from the Operetta to modern day Broadway. Researches musical theatre composers and lyricists. Prerequisite: ENG 203 or ENG 204.

**THE 321 Arts Management (3-0-3).** Examines fundamentals of management as it applies to the arts, including theater, children's theater, opera, concerts, museums, theme parks, trade shows, expo centers, cruise ships, film and other cultural events. Prerequisite: THE 101 or THE 102 or THE 141 or THE 150 or THE 242 or THE 250 or MGT 201 or permission of the instructor.

**THE 346 Theatrical Makeup and Special Effects (2-1-3).** Explores the theory and practice of two-dimensional and three-dimensional makeup for live performance. Includes designing a face schematic based on facial anatomy, character analysis and historical resources. Creates makeup designs with adaptations for different performance spaces, themes, characters and time periods. Explores creation of various aspects of special effects make-up. Prerequisite: ENG 203 or ENG 204.

**THE 351 Advanced Rehearsal and Performance (0-4-1).** Provides advanced experience turning a dramatic script into a theatrical performance. Employs rehearsal and performance techniques used in professional production. Emphasizes the full development of character creation, which includes creation of a researched character history profile. Explores the role of stage manager in full detail, which includes development of a complete prompt book. Graded as Pass/Fail. Repeatable up to 3 credit hours. Prerequisite: THE 251 (earned 3 credit hours).

**THE 352 Dance Styles for the Stage (2-1-3).** Explores various styles of dance for the stage and examines the history of diverse techniques in dance. Covers methods and skills needed for dance performances through in-class dance activities and rehearsals. Addresses the factors that influence the development and performance of choreographed dance routines developed for the stage. Prerequisite: ENG 203 or ENG 204.

**THE 355 Acting Styles (3-0-3).** Explores an advanced approach to acting in different styles. Prepares for independent work as an actor utilizing the Stanislavsky system as it applies to various acting styles. Includes in-depth character study, readings, character history and analyses. Prerequisite: ENG 203 or ENG 204.

**THE 361 Playwriting (3-0-3).** Explores the process of playwriting. Covers playwriting structure and implications of theatre spaces. Creates opportunities to workshop student plays. Examines well-known plays, as well as foundations laid by Aristotle. Develops student-written one-act plays. Culminates with a final stage reading of each play that is read by actors and classmates. Prerequisite: ENG 203 or ENG 204.

## TRA Translation and Interpreting

**TRA 210 Introduction to Translation (3-0-3).** Introduces the field of translation and the skills necessary to work as a successful translator. Emphasizes a problem-solving approach, supported by text analysis (both in the pre-translation phase and in subsequent editing and evaluation). Requires practical tasks that involve translation into and out of English and Arabic. Prerequisite/concurrent: WRI 101.

**TRA 220 Theoretical and Practical Issues in Translation (3-0-3).** Views translation practice as seen in the light of various theories and models of translation. Invokes theories informed by modern linguistics, cultural studies and literary criticism with the aim of sensitizing the translator to the intricacies of the task. Assesses and examines at various levels of language organization (word level, sentence level, text level, pragmatics, etc.) the key notion of "equivalence." Examines

issues such as the translation of metaphor and idiomatic expressions, dealing with meaningful repetition and biased translation shifts. Prerequisite: WRI 102.

**TRA 230 Translating Arabic Literary Texts (3-0-3).** Introduces basic theories of literary translation and applies them to a selection of Arabic literary texts from different genres. Covers linguistic and non-linguistic (cultural) dimensions of literary translation. Highlights the role of literary translation in human interaction. Prerequisite: WRI 102.

**TRA 301 Modern Media Translation (3-0-3).** Focuses on those modes and situations that relate to the translation of the print media. Includes the processing and translation of advertisements, news reports, magazine articles, public relations and promotional literature, and publicity materials within a framework of media translation studies. Prerequisite: TRA 210 or TRA 220, or ARA 101 and MCM 150.

**TRA 303 Interpreting: Focus on the Community (3-0-3).** Introduces interpreting and distinguishes this skill from translation. Nurtures the ability to understand and analyze a message in the source language and convey it in the target language in a straightforward and clear manner. Develops the basic skills of liaison interpreting, with special emphasis on community interpreting (doctor-patient, court, official transactions, etc.) Prerequisite: TRA 210. Lab/Tech fee rate B applies.

**TRA 307 Screen Translation (3-0-3).** Introduces screen translation and the stylistic features and cultural aspects of screen productions. Provides training in the translation of scripts of various cinema and TV scripts from and into Arabic. Deals with the problems encountered by the translator in rendering these genres. Prerequisite: TRA 210 or TRA 220.

**TRA 401 Translation Evaluation and History (3-0-3).** Explores the conceptual map of translation studies and reflects on important points in the history of translation. Emphasizes both Western and Eastern translation traditions and the role of translation in the development of culture and identity. Introduces translation evaluation, and develops rigorous assessments schemes. Prerequisite: TRA 210.

## WRI Writing Studies

**WRI 001 Basic Academic Writing (3-0-3).**Focuses on critical reading and writing skills, basic invention strategies, informal writing assignments, paragraph development and contextualized grammar instruction. Introduces narrative, expository and reflective forms of academic writing. Students must successfully complete WRI 001 by the end of Sophomore I standing. Prerequisite: EPT score less than 4.

**WRI 101 Academic Writing I (3-0-3).** Focuses on invention, analysis, critical thinking and the rhetorical situation. Introduces analytic and introductory argument essays. Introduces quotation, paraphrase and summary, and the basics of a clear, effective and varied academic style. Students must successfully complete WRI 101 by the end of Junior I standing. Prerequisite: EPT score of 4 or ELPT score of 1 or WRI 001, or placement into WRI 101.

**WRI 102 Academic Writing II (3-0-3).** Introduces critical writing and information literacy skills. Focuses on analyzing and evaluating texts, constructing cogent arguments and using sources effectively. Builds on analytic thinking, argument, critical reading skills and an academic style developed in WRI 101. Introduces the argument/persuasion essay, evaluation essay and short research essay. Students must successfully complete WRI 102 by the end of Junior I standing. Prerequisite: WRI 101.

**WRI 221 Peer Tutoring in Writing (3-0-3).** Focuses on issues and theories of writing and peer-collaboration as they relate to peer tutoring in writing. Involves readings and class discussion that encourages critical thinking about writing and the teaching and tutoring of writing. Explores the views of different writers towards their craft, writers as individuals, issues of writing in a second language, and the role of "talking" in writing. Provides preparation for the second part of the course in which students prepare for possible roles as Writing Center Tutors or Writing Fellows. Focuses largely on "hands-on" learning as students observe writing center tutorials, experience teaching each other, and comment on sample papers. Prerequisite/concurrent: ENG 203 or ENG 204.

## WST Women's Studies

**WST 240 Introduction to Women's Studies (3-0-3).** Introduces women's studies, its perspectives and its interdisciplinary nature. Emphasizes feminist analysis and critical thought as a way of making knowledge. Draws on history, literature, popular culture and the arts to analyze the forces that shape women's lives and examine women's position in culture and society. Prerequisite: WRI 102.

**WST 250 Women's Voices Across Cultures (3-0-3).** Examines debates surrounding the genre of autobiographical writing by women across cultures. Considers the aspirations, frustrations and achievements of women as documented in their own words. Explores the ways in which language and representation in various cultures shape subjectivity, challenge and redefine the boundaries of the autonomous self. Prerequisite: WRI 102.

**WST 300 Women, Science and Technology (3-0-3).** Examines the relationships between gender and science and technology. Appraises the most notable achievements of women in science and technology across cultures. Investigates how scientific and technical power and knowledge operate in society. Analyzes the social barriers faced by women seeking a scientific career. Presents feminist critiques of science and technology. Prerequisite: ENG 203 or ENG 204 or HIS 208 or WST 240 or WST 250.

# AUS Courses Offered Abroad

AUS courses offered abroad provide degree-seeking students with the opportunity to complete and earn credit hours for AUS courses or AUS studios that are conducted in a regional or an international site.

**Course Abroad (1 to 3 credit hours).** Features on-site visits offering the opportunity to experience first-hand regional and international design practices or to engage in site-specific design projects, highlighting particular themes relevant to the specific location. Department permission is required for enrollment and credit. Can be repeated for credit. Prerequisites: topic specific. Lab/Tech fee may apply.

**Studio Abroad (3 to 6 credit hours).** Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Prerequisite: studio specific.

Courses abroad are numbered as 193, 293, 393 or 493 courses. Studio abroad courses are numbered as 498. The three-letter course prefix reflects the field of study of the course.

Descriptions of AUS courses offered abroad are made available in the college during registration.

## Independent Study

Independent study is the umbrella term used to label two types of independent work: independent course and directed study.

Students are allowed to take one independent study. A second independent study could be approved by the student's associate dean for graduation purposes only.

**Independent Course (1 to 4 credit hours).** An existing course offered in an independent study format. The course is coded using the course number in the catalog. Approved special topic courses can be offered in an independent course format.

Students are not allowed to repeat courses in an independent course format.

To be eligible to apply for an independent course, students must be in good standing.

**Directed Study (1 to 4 credit hours).** An investigation under faculty supervision beyond the scope of existing courses. Prerequisites: minimum CGPA of 3.00, Junior II standing and consent of the instructor.

Directed study courses are numbered as 396 or 496 courses. The three-letter course prefix reflects the field of study of the course (e.g., directed study courses in Arabic are coded as ARA 396 or ARA 496).

For more details on independent study, please refer to Registration in Independent Study Courses in the Academic Policies and Regulations section of this catalog.

## Interdisciplinary Study Courses

Interdisciplinary study (IDS) courses provide opportunities for students to benefit from collaboration by faculty from a range of disciplines. Courses with an IDS course code are normally co-taught by two or more faculty members and focus on topics beyond those offered in existing courses. Prerequisites: topic specific. Lab/Tech fee may apply.

IDS courses at the 300 level require sophomore standing or above; 400-level IDS courses are restricted to junior standing and above.

Descriptions of particular IDS courses are made available during registration.

## Special Topic Courses

**Special Topic (1 to 4 credit hours).** Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit. Prerequisites: topic specific. Lab/Tech fee may apply.

Special topic courses are numbered as 194, 294, 394 or 494 courses. The three-letter course prefix reflects the field of study of the course.

Special topic courses at the 300 level require sophomore standing or above; 400-level special topic courses are restricted to junior standing and above.

Descriptions of particular special topic courses are made available in the college during registration.

# College of Engineering

## ASE Aerospace Engineering

**ASE 415 Aircraft Stability and Control (3-0-3).** Covers reference frames, equations of motion for a rigid body, forces and moments, trim, linearization, dynamic response characteristics for aircraft and spacecraft. Includes aircraft stability derivatives, static longitudinal and lateral stability, handling qualities, phugoid, short period, spiral, roll subsidence, Dutch roll modes and the corresponding transfer functions. Prerequisite: MCE 328.

**ASE 450 Applied Aerodynamics (3-0-3).** Covers basic equations of aerodynamics, potential flow theory, incompressible flow over airfoils, incompressible flow over finite wings, three dimensional flows and panel techniques and elements of airplane performance: rate of climb, gliding flight, range and endurance, takeoff and landing performance. Prerequisite: MCE 240; prerequisite/concurrent: MCE 325.

**ASE 452 Aerospace Propulsion (3-0-3).** Focuses on air-breathing propulsion systems and rocket engines. Covers turbojets, turbofans, turboprops, ramjets and their operational envelope. Addresses gas turbine thrust, specific fuel consumption, efficiency and design process. Considers design-point analysis of ideal and real gas turbines, components performance and rocket propulsion systems. Prerequisites: MCE 240 and MCE 241.

**ASE 454 Thermal Design Issues for Aerospace Systems (3-0-3).** Deals with processes, systems, instruments and equipment for aerospace systems. Emphasizes issues of energy conversion and thermal design. Includes the following topics: thermodynamic concepts and heat transfer processes for aerospace systems, the space environment, influence of gravity on heat transfer, power generation for space systems (energy sources, solar cell arrays, energy storage), thermal control (analysis techniques, design procedures, active versus passive design, heating and refrigeration) and environmental effects. Prerequisite: MCE 344.

**ASE 470 Aircraft Structures (3-0-3).** Examines the characteristics of aircraft structures and materials; stress strain relationships in two and three dimensions; torsion, bending and flexural shear in thin-walled sections; buckling and fatigue analysis of thin wall structures; analysis of composite laminates; introduction to aeroelasticity and energy methods. Prerequisite: MCE 321.

**ASE 475 Aircraft Design (3-0-3).** Covers the theory, background and methods of aircraft design. Integrates aerodynamics, structure, propulsion, flight dynamics and control in the design of aircrafts. Prerequisites: ASE 415, ASE 470 and MCE 482.

## BME Biomedical Engineering

**BME 210 Biomedical Ethics (1-0-1).** Applies ethical principles and decision-making processes to selected problems in medicine, health care and biotechnology. Gives special attention to end-of-life choices, reproductive rights and technologies, organ transplantation, research ethics, genetic engineering and allocation of scarce resources. Focuses on social, legal, economic and scientific issues in ethical decisions in medicine. Prerequisites: BIO 101 and WRI 102.

**BME 410 Biomedical Systems Modeling I (3-0-3).** (Equivalent to CHE 481). Introduces and applies engineering principles including biomechanics, fluid mechanics, heat transfer, chemical reaction kinetics and materials science to model physiological systems and solve medical problems. Prerequisite/concurrent: BIO 210.

**BME 411 Biomedical Systems Modeling II (3-0-3).** Applies principles of kinetics and mass transfer to model physiological systems including pharmacokinetics, membrane transport, renal filtration and gas exchange to design medical devices. Prerequisite/concurrent: BME 410.

**BME 420 Biomedical Electronics I (3-0-3).** (Equivalent to ELE 432). Covers biomedical sensors and instrumentation, biopotential electrode, chemical and clinical biosensors, bioelectric phenomena, the electrocardiograph, the electroencephalograph, blood pressure and cardiac output measurements, and electrical safety. Not open to electrical engineering students. Prerequisite: ELE 225 or ELE 341.

**BME 421 Biomedical Electronics II (3-0-3).** Covers pulmonary system measurements, blood gas analysis, clinical laboratory instrumentation, biomedical optics and lasers, and therapeutic and prosthetic devices and systems. Prerequisite: BME 420.

**BME 422 Biomedical Imaging (3-0-3).** Covers imaging techniques, including ultrasound imaging, x-ray imaging, computerized tomography, magnetic resonance imaging, microwave imaging, thermal imaging and nuclear imaging. Covers the following for each of the addressed imaging techniques: radiation propagation and interaction with materials, generation and detection, and image construction and reconstruction. Covers radiation protection. Prerequisite: ELE 225 or ELE 341.

**BME 424L Biomedical Electronics Laboratory (0-3-1).** (Equivalent to ELE 439L). Explores data acquisition tools, medical signal processing, biopotential amplifiers, biopotentials, bioimpedance measurements, blood pressure measurements, respiratory measurements, ultrasonic measurements and electrical safety. Prerequisite/concurrent: BME 420. Lab/Tech fee rate B applies.

**BME 430 Biomechanics (3-0-3).** Presents the fundamentals of orthopedic biomechanics and the application of solid mechanics toward describing physiological systems. Emphasizes the interaction between biomechanical and physiologic factors (bone, connective tissue and muscle and joint physiology and structure) in the musculoskeletal system and application of engineering principles in clinical practice. Prerequisite: CHE 230 or MCE 222 or MCE 224.

**BME 431 Biomaterials (3-0-3).** Provides an overview of materials used in biomedical applications, both internal and external to the human body. Covers structure and properties of biomaterials in addition to material performance in hostile environments. Prerequisite: BME 410 or BME 430.

**BME 432 Biothermofluids (3-0-3).** Discusses the fluid and thermodynamics principles underlying the operation of physiological systems, including the heart and circulatory system and the lungs and pulmonary system. Prerequisite: BME 410 or BME 430.

**BME 440 Bioinformatics (3-0-3).** Discusses elementary topics in bioinformatics. Includes the basics of molecular genetics, the biological aspects of bioinformatics, data searches, algorithms for pairwise alignments and substitution patterns. Prerequisites: BIO 210 and ELE 360.

# CHE Chemical Engineering

**CHE 205 Principles of Chemical Engineering I (2-1-2).** Introduces the analysis of chemical process systems using mass conservation equations, stoichiometry and steady state calculations. Covers unit conversions and process flow sheets. Introduces ideal and real gas relationships. Prerequisites: CHM 101 and MTH 103.

**CHE 206 Principles of Chemical Engineering II (2-2-3).** Covers material balances for multiphase systems, the application of energy balances to chemical engineering equipment and processes. Includes the following topics: steady state energy balances with and without chemical reactions, heat of solution and mixing, humidity charts and simultaneous material and energy balances. Introduces process simulation. Discusses contemporary issues in chemical engineering. Emphasizes the role of writing in the development of technical reports. Restricted to students formally admitted to the second-year level in chemical engineering. Prerequisite: CHE 205; prerequisites/concurrent: CHM 102 and WRI 102.

**CHE 214 Chemical Engineering Thermodynamics I (2-2-3).** (Formerly CHE 303). (Equivalent to MCE 241). Studies the first, second and third laws of thermodynamics and their application in chemical engineering; volumetric properties of pure fluids; definitions and use of internal energy, enthalpy, entropy and free energy; Maxwell relations; ideal and real cycles and processes; refrigeration and liquefaction. Restricted to students formally admitted to the second-year level in chemical engineering. Prerequisite/concurrent: CHE 206.

**CHE 230 Materials Science (3-1-3).** Introduces material science, relationships between structure and properties of materials. Includes the following topics: atomic bonding, crystalline structures, crystal defects and imperfections; phase diagrams and equilibrium microstructural development; and properties of engineering materials. Prerequisite/concurrent: CHM 215. Lab/Tech fee rate B applies.

**CHE 240 Computer Methods in Chemical Engineering (3-2-3).** Covers the use of Matlab to solve chemical engineering problems. Includes the following numerical techniques: solution of linear and nonlinear algebraic equations, ordinary differential equations, and numerical integration and differentiation. Restricted to students formally admitted to the second-year level in chemical engineering. Prerequisite: CHE 205; prerequisites/concurrent: MTH 205 and MTH 221. Lab/Tech fee rate B applies.

**CHE 300 Fluid Mechanics (3-0-3).** (Formerly CHE 215). Explores introductory concepts of fluid mechanics and fluid statics, fluid properties, basic equations of fluid flow, flow of compressible and incompressible fluids in pipes and other shapes, velocity distribution, laminar and turbulent flow, differential analysis of basic viscous incompressible flows, flow past immersed bodies and dimensional analysis. Prerequisites: PHY 101 and PHY 101L; prerequisites/concurrent: CHE 214 and MTH 205.

**CHE 304 Chemical Engineering Thermodynamics II (3-0-3).** Examines thermodynamic properties of fluids and mixtures, residual properties, excess properties, phase equilibria and chemical reaction equilibria for gases and liquids. Prerequisite: CHE 214; prerequisite/concurrent: MTH 203.

**CHE 307 Heat Transfer (3-0-3).** (Equivalent to MCE 344). Covers mechanism of heat transfer; heat transfer by conduction, convection and radiation; and analysis of heat transfer equipment used in chemical engineering. Prerequisites: CHE 206 and MTH 205; prerequisite/concurrent: CHE 300.

**CHE 321 Chemical Reaction Engineering (3-0-3).** Examines chemical reaction kinetics, interpretation of experimental rate data, design of batch and continuous reactors, effect of temperature and pressure, and heterogeneous catalysis. Prerequisite: CHE 240; prerequisites/concurrent: CHE 304 and CHE 307.

**CHE 329 Mass Transfer (3-0-3).** Covers mechanisms of mass transfer, laws of diffusion, mass transfer coefficients, theories of mass transfer, and mass transfer and chemical reactions. Prerequisite: CHE 307.

**CHE 332 Engineering Economy (3-0-3).** Covers topics in finance and economics involved in the design of chemical processes and equipment: time value of money, depreciation, profitability, evaluation of alternatives, replacement and capital analysis. Prerequisite: junior standing.

**CHE 350 Chemical Engineering Laboratory I (0-3-1).** Covers experiments in fluid flow, heat transfer, and thermodynamic measurement and analysis of devices. Includes experimental design, safety, and report writing. Prerequisite: NGN 111; prerequisites/concurrent: CHE 214 and CHE 307. Lab/Tech fee rate B applies.

**CHE 397 Professional Training in Chemical Engineering (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator for the major. Registration fee applies.

**CHE 412 Separation Processes (3-0-3).** (Formerly CHE 342). Examines application of mass transfer principles to the design of multi-stage systems and countercurrent differential contacting operations. Prerequisites/concurrent: CHE 304, CHE 329 and CHM 217.

**CHE 421 Chemical Process Dynamics and Control (3-0-3).** Examines principles of process dynamics and control in chemical engineering applications; transfer functions; block diagrams; input disturbance; frequency response and stability criteria; single and multi-loops; P, PI and PID controllers; and process control software. Prerequisites/concurrent: CHE 321 and CHE 412.

**CHE 432 Process Design, Safety and Economics (3-0-3).** Covers the application of chemical engineering principles to the design and integration of chemical equipment and processes. Includes the following topics: process safety, pollution prevention and waste minimization, plant economics and cost estimation. Prerequisites: CHE 230 and CHE 321; prerequisites/concurrent: CHE 332 and CHE 412.

**CHE 433 Chemical Process Safety (3-0-3).** Examines issues in industrial health and safety specific to chemical processes. Includes the following topics: toxicology and toxic releases, risk assessments, the causes of industrial accidents and preventive measures, designing chemical process equipment to reduce the risk of fire and explosion, pressure relief systems, industrial hygiene, and health and safety regulations. Prerequisite/concurrent: CHE 432.

**CHE 434 Petroleum Refining Processes (2-2-3).** Presents an overview of petroleum refining processes. Includes the following topics: introduction to petroleum, its origins and composition, basic principles of refining, the effect of feedstock on refinery design, selection of refinery units, design of major equipment and refinery economics. Prerequisite: CHM 215;

prerequisite/concurrent: CHE 412. Lab/Tech fee rate B applies.

**CHE 436 Natural Gas Processing (3-0-3).** Provides basic and applied knowledge in natural gas processing. Includes the following topics: characterization of natural gas and its products, phase behavior of natural gas, water-hydrocarbon phase behavior, prevention of hydrate formation, gas sweetening, gas dehydration using glycol, gas dehydration using solid desiccants, natural gas liquids recovery, sulfur recovery and design and sizing of equipment. Prerequisite/concurrent: CHE 432.

**CHE 443 Design and Analysis of Experiments (3-0-3).** Provides an overview of basic statistical methods and addresses the following topics: analysis of variance, experiments with blocking factors, factorial experiments, two-and three-level factorial designs, blocking and confounding, two-level fractional factorial designs, introduction to regression modeling and response surface methodology, and statistical software packages. Emphasizes applications and case studies related to chemical engineering. Prerequisite: senior standing.

**CHE 451 Chemical Engineering Laboratory II (0-3-1).** Comprises hands-on laboratory experiments illustrating the application of chemical engineering principles, and calculations. Covers mass transfer equipment, physical and chemical separation, reaction kinetics and reactor design. Includes safety and report writing. Prerequisites: CHE 321 and CHE 350; prerequisite/concurrent: CHE 412. Lab/Tech fee rate B applies.

**CHE 452 Process Dynamics and Control Laboratory (0-3-1).** Comprises laboratory experiments illustrating various applications of chemical engineering principles related to process control and dynamics. Covers different control modes such as P, PI, PID and cascade control. Includes experimental design, safety and report writing. Prerequisite: CHE 350; prerequisite/concurrent: CHE 421. Lab/Tech fee rate B applies.

**CHE 461 Air Pollution (3-0-3).** Covers environmental pollution; acid gas removal; sulfur oxides, nitrogen oxides and carbon gases removal; removal of volatile organic compounds; design of main process equipment and control devices; and aerosols. Prerequisite/concurrent: CHE 412.

**CHE 467 Corrosion (2-3-3).** Examines electrochemical principles; galvanic cell; Nernst equation; electromotive force; corrosion mechanisms and techniques; corrosion due to dissimilar metal, differential aeration, strain and temperature; corrosion types, cavitation, fatigue, microorganisms; corrosion prevention, inhibitors, electrical protection; and corrosion case studies in petroleum industry. Prerequisite: CHM 101. Lab/Tech fee rate B applies.

**CHE 470 Waste Management and Control in Chemical Engineering (3-0-3).** Covers management and control of gaseous, liquid and solid wastes; regulation and management procedures; waste minimization and resource recovery; and separations and reaction engineering approaches. Prerequisite/concurrent: CHE 412.

**CHE 472 Water and Wastewater Treatment Design (2-2-3).** Covers design and selection of biological, physical and chemical processes used in water and wastewater treatment, disposal of treated effluent, water quality, and industrial wastewater characterization. Prerequisite/concurrent: CHE 329. Lab/Tech fee rate B applies.

**CHE 481 Fundamentals of Biomedical Engineering (3-0-3).** (Equivalent to BME 410). Uses chemical engineering principles including fluid mechanics, heat transfer, kinetics and material science to model physiological systems and solve medical problems. Prerequisite: CHE 300; prerequisite/concurrent: CHE 307.

**CHE 490 Senior Design Project I (1-2-1).** Requires a supervised design project of defined chemical engineering significance. Work includes data collection, analysis, calculation, design and presentation of the work in a detailed technical report. Requires oral presentation and defense of the project. Current practices in the chemical engineering field are discussed through guest lectures. Prerequisite: ENG 207; prerequisite/concurrent: CHE 432.

**CHE 491 Senior Design Project II (0-6-2).** Continues the work of CHE 490. Prerequisite: CHE 490.

## CMP Computer Science

**CMP 120 Programming I (3-2-3).** Provides an overview of computer architecture and programming. Examines elements of a C++ program, statements and expressions, data types, relational and logical operators, conditional and iterative control structures. Examines, file I/O, declaration and initialization of arrays and strings, pointers and function arguments. Covers program design and testing, and modular programming. Includes laboratory and programming assignments. Prerequisite: NGN 110 or sophomore standing. Lab/Tech fee rate A applies.

**CMP 213 Discrete Structures (3-0-3).** (Equivalent to MTH 213). Covers propositional and predicate calculus, sets, major classes of functions and related algorithms, asymptotic analysis of functions, principle of mathematical induction, proof techniques, recursive definitions, counting, relations, graphs and trees. Computer science and computer engineering students who are not yet formally admitted to the second-year level in the major are not eligible to take this course. Prerequisite: MTH 103.

**CMP 220 Programming II (3-2-3).** Covers object-oriented programming concepts: constructors, destructors, objects, classes, functions and attributes, operator overloading and overriding, inheritance and polymorphism. Explores abstraction principles (interfaces, information hiding, encapsulation), templates, exception handling, I/O streams and advanced pointers. Uses the C++ programming language in laboratory work. Prerequisite: CMP 120. Lab/Tech fee rate A applies.

**CMP 235 Ethics for Computing and Information Technology (3-0-3).** (Equivalent to PHI 206). Examines ethical theories and ethical decision-making models applied for computing and information technology. Offers in-depth discussion of social, ethical and professional issues in computing, including the codes of ethics of computing professional societies; intellectual property defined by copyright, patent and trade secrets; privacy; confidentiality; conflict of interest; cybercrime; hacking; viruses; and identity theft. Prerequisite: WRI 102.

**CMP 256 GUI Design and Programming (3-2-3).** Covers the design and implementation of interactive graphical user interfaces (GUI). Provides an introduction to object-oriented Java programming and software patterns, including key GUI-centric features such as Java interfaces, multi-threading, exception handling, and the strategy and model-view-controller patterns. Covers basic 2D graphics operations, essential GUI components, their layout and related interface design principles, and their interactions using the event-driven programming paradigm. Not open to computer engineering students. Prerequisite: CMP 220. Lab/Tech fee rate A applies.

**CMP 305 Data Structures and Algorithms (3-2-3).** Covers the design, analysis and implementation of abstract data types and related

algorithms to solve computing problems efficiently. Includes fundamental data structures such as arrays, linked lists, stacks and queues, as well as advanced data structures such as trees, hash tables, heaps and graphs. Studies algorithms for manipulating these data structures, recursive programming, searching and sorting. Laboratory work includes substantial programming assignments. Prerequisite: CMP 220; prerequisite/concurrent: CMP 213 or MTH 213. Lab/Tech fee rate A applies.

**CMP 310 Operating Systems (3-1-3).** Introduces operating systems, process management, process scheduling, interprocess communications, memory management techniques, virtual memory, I/O management, deadlock avoidance, file system design and security issues. Employs examples of commonly used operating systems (e.g., Windows and UNIX). Prerequisites: CMP 305, and COE 241 or COE 251. Lab/Tech fee rate A applies.

**CMP 320 Database Systems (3-2-3).** Introduces the basic principles of database management systems; data models, including conceptual and logical models; translation between data models; query languages; normalization of relations and database application development. Prerequisite: CMP 305. Lab/Tech fee rate A applies.

**CMP 321 Programming Languages (3-2-3).** Introduces the fundamental principles and techniques in the design and implementation of modern programming languages. Covers key topics such as syntax and semantics, binding and scope, data types, control structures and expressions. Discusses different programming paradigms, such as imperative, functional, logic and object-oriented. Prerequisites: CMP 256 or COE 312, and CMP 305. Lab/Tech fee rate A applies.

**CMP 340 Design and Analysis of Algorithms (3-0-3).** Covers algorithmic analysis; algorithmic strategies; advanced searching and sorting algorithms; hashing, graph and spanning trees algorithms; topological sort; pattern matching; numerical algorithms; matrix operations; complexity classes; approximation algorithms; and basic computability theory. Prerequisites: CMP 305, and NGN 111 or STA 201.

**CMP 352 Human Computer Interaction (3-0-3).** Examines human behavior in relation to user interface design. Analyzes the conceptual models formed by users and evaluates user interface design. Examines multimedia interfaces, usability engineering, user interface design and project organization. Studies interface representation and user-centered prototyping tools. Examines a number of case studies. Requires a project. Prerequisites: CMP 256 or COE 312, and CMP 305.

**CMP 354 Mobile Application Development (3-2-3).** Covers mobile application development with emphasis on object-oriented programming. Includes the following topics: mobile software development kits (SDK) and application programming interfaces (API); management of sensor and location-based data, user interactions and touch events; background processes and notifications; mobile persistence storage; and broadcast receivers. Prerequisite: CMP 256 or COE 312. Lab/Tech fee rate A applies.

**CMP 397 Professional Training in Computer Science (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator for the major. Registration fee applies.

**CMP 404 Cloud Computing (3-0-3).** Explores core concepts of the cloud computing paradigm, technology and software development. Covers cloud delivery models, cloud deployment models (private, public, community and hybrid), cloud computing architecture, virtualization, web services technologies, cloud services development and deployment, resource management, and data storage, access, partitioning and synchronization. Prerequisite: CMP 310.

**CMP 416 Internet and Network Computing (3-2-3).** Studies the design of Internet-based clients and servers, and multi-tiered applications, network application security, distributed object computing, remote method invocation, Internet technology standards such as XML and JavaScript, and building Internet-based applications. Prerequisites: CMP 310, CMP 320 and COE 371. Lab/Tech fee rate A applies.

**CMP 418 Multicore Computing (3-0-3).** Covers models of parallel computation and software development on multicore systems. Examines problem decomposition patterns including divide-and-conquer, geometric decomposition, task parallelism and pipelining. Covers program structure patterns such as master-worker, map-reduce and fork-join. Provides hands-on experience with high-performance multicore platforms, including both Central Processing Unit and Graphics Processing Unit architectures and state-of-the-art software tools. Prerequisite: CMP 310.

**CMP 430 Computer Graphics (3-0-3)**. Introduces the fundamental principles and techniques of computer graphics using state-of-the-art tools. Covers viewing and ray tracing, imaging and displays, rasterization, antialiasing, intersection and clipping, triangle meshes, spline curves and surfaces, 2D and 3D transformations and projections, illumination and shading, geometric modelling, animation. Addresses topics such as human visual perception, hardware and software acceleration. Prerequisites: CMP 305 and MTH 221.

**CMP 433 Artificial Intelligence (3-0-3).** Introduces the fundamental concepts and techniques of artificial intelligence. Studies the structure and components of intelligent agents and systems. Includes problem-solving methods, knowledge representations, formal logic and probabilistic reasoning. Examines selected advanced topics such as expert systems, planning, machine learning and approximate reasoning, as well as case studies of AI in the real world. Prerequisite: CMP 305.

**CMP 450 Object-Oriented Software Engineering (3-0-3).** Explores object-oriented analysis and design. Covers topics in object-oriented analysis and design: object-oriented requirements capturing, modeling and refinement. Includes object-oriented design, design patterns and object-oriented testing. Requires completion of a substantial object-oriented software project. Prerequisite: CMP 305.

**CMP 454 Software Testing and Quality Engineering (3-0-3).** Provides an overview of software engineering. Covers software quality assurance; black-box and white-box testing; integration and regression testing; and selected topics from the following: object-oriented software testing, acceptance testing, conformance testing, diagnostic testing, test execution, distributed systems testing, test languages and test tools, GUI testing, interoperability testing, test metrics, and standards for software quality and testing. Prerequisite: CMP 305.

**CMP 466 Machine Learning and Data Mining (3-0-3).** Introduces principles of machine learning and data mining methods for the discovery of knowledge from datasets. Covers key topics in machine learning and data mining including data preparation, dimensionality reduction, visualization, supervised and unsupervised learning, and association mining. Focuses on practical applications using state-of-the-art software tools. Prerequisites: CMP 120, MTH 221, and NGN 111 or QBA 201 or STA 201 or STA 202.

**CMP 490 Project in Computer Science I (0-3-1).** Includes faculty-supervised projects on special topics of current interest. Requires both oral and written presentations on the topics. Prerequisites: CMP 235, ENG 207 and senior standing; prerequisite/concurrent: COE 420.

**CMP 491 Project in Computer Science II (0-6-2).** Continues the work of CMP 490. Prerequisite: CMP 490.

## COE Computer Engineering

**COE 221 Digital Systems (3-3-4).** Covers number systems, representation of information, introduction to Boolean algebra, and combinational and sequential circuits analysis and design. Prerequisites: PHY 102 and PHY 102L, or CMP 120. Lab/Tech fee rate A applies.

**COE 241 Microcontrollers: Programming and Interfacing (3-3-4).** Examines the basic hardware building blocks, addressing modes and instruction sets of microprocessors and microcontrollers. Introduces selection criteria for microcontrollers. Covers digital and analog input/output, timers, interrupts and serial communications, programming and interfacing. Restricted to students formally admitted to the second-year level in computer engineering or electrical engineering, and to students pursuing a minor in computer engineering or mechatronics engineering. Prerequisites: CMP 120 or MCE 226L, COE 221, and ELE 211 or ELE 225. Lab/Tech fee rate B applies.

**COE 251 Introduction to Computer Systems (3-3-4).** Examines hardware and software model of microprocessors; programming of microprocessors; memory systems, memory interface and memory access (DMA); input/output programming and interface; and design of microprocessors-based systems. Prerequisites: CMP 120 or MCE 226L, and COE 221. Lab/Tech fee rate B applies.

**COE 312 Software Design for Engineers (2-3-3).** Covers software design patterns. Considers advanced Java programming, including multi-threading, collection, I/O and communication libraries. Addresses the use of Java to implement wired and wireless communication interfaces, including reading and writing, serial, parallel, synchronous and asynchronous steams and sockets. Focuses on the design of message and event-based software architectures. Includes course project. Prerequisites: CMP 220, and COE 241 or COE 251. Lab/Tech fee rate B applies.

**COE 341 Computer Architecture and Organization (3-0-3).** Covers CPU organization and microarchitectural level design; RISC design principles; memory, peripheral devices and input/output busses; DSP processor architectures; and introduction to parallel computing. Prerequisite: COE 241 or COE 251.

**COE 370 Communications Networks (3-0-3).** Examines the principles of circuit and Packet communications networks. Includes the following topics: OSI and Internet reference models, time-domain and frequency-domain analysis of communication signals and systems, line coding, analog and digital modulations, transmission media, error and flow control techniques and protocols, multiple access, and LAN technologies. Prerequisites: COE 221 and MTH 104.

**COE 371 Computer Networks I (3-2-3).** Provides an overview of computer networks and the Internet. Covers application layer services and protocols, transport layer services, principles of flow and congestion control, network layer addressing, forwarding and routing, link layer protocols, addressing and multiple access, multimedia networking, computer networks security, and network delay performance. Prerequisites: COE 221 and MTH 104. Lab/Tech fee rate B applies.

**COE 375 Modeling and Simulation of Stochastic Systems (3-0-3).** Examines concepts of probability and stochastic processes and their applications to computer engineering problems. Includes the following topics: random variables, random processes, queuing models, discrete-event and discrete-time simulation and its application to computer systems and networks performance. Emphasizes the use of computer programs and industry-standard simulation packages to model stochastic computer systems. Not open to students who have completed ELE 360. Prerequisite: NGN 111 or STA 201; prerequisite/concurrent: COE 370 or COE 371.

**COE 397 Professional Training in Computer Engineering (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator for the major. Registration fee applies.

**COE 410 Embedded Systems: Design and Applications (2-3-3).** Introduces embedded systems computing platforms and examines their basic building blocks. Covers programming and interfacing, process-controlled and time-controlled interrupt handling. Explores communication methods and real-time operating systems. Evaluates embedded systems design requirements and specifications, reviews embedded systems emerging applications. Includes laboratory work and team projects. Prerequisites: COE 241, and ELE 225 or ELE 241. Lab/Tech fee rate B applies.

**COE 420 Software Engineering (3-1-3).** Introduces the basic principles and practices of software engineering. Emphasizes the different phases of the software development process and quality issues. Includes the following topics: software life cycle models; general design, implementation and testing issues; specification and design methodologies; model-based approaches to software design; project management; and the use of various design and development tools. Prerequisites: CMP 305, and COE 312 or CMP 256. Lab/Tech fee rate A applies.

**COE 424 Advanced Digital System Design (3-2-3).** Covers advanced digital design techniques, structured design methods for advanced digital design, case studies of complex digital circuits, hardware description languages (HDL) and PLD implementations, reliable design and testing techniques. Prerequisite/concurrent: COE 341. Lab/Tech fee rate B applies.

**COE 425 Modern Computer Organizations (3-0-3).** Covers performance measures, RISC processors, datapath and control units design, memory hierarchy, pipelining, I/O systems and multiprocessors. Prerequisite: COE 341.

**COE 428 VLSI Design (3-0-3).** Covers CMOS technology, layout rules and techniques, CMOS logic and circuit design, circuit characterization and performance estimation, and design methodologies and tools. Prerequisites: COE 221 and ELE 241.

**COE 431 Industrial Cyber Physical Systems (2-3-3).** Covers the conceptual model and layers of cyber physical systems (CPS); the industrial applications in CPS of microprocessor-based data acquisition units and programmable logic controllers; web-based monitoring and control of industrial plants; and recent developments in industrial automation. Includes class projects. Prerequisite: COE 410 or ELE 341. Lab/Tech fee rate B applies.

**COE 434 Wireless and Mobile Networks (3-0-3).** Covers wireless communications and networks, location management, routing in ad hoc wireless network, file systems issues and caching strategies. Prerequisite: COE 370 or COE 371.

**COE 444 Computer Security (3-0-3).** Covers a broad variety of topics in computer security. Includes the following topics: authentication and authorization, introduction and application of cryptography, social engineering attacks, physical security, network security, application security (web, e-mail), wireless security, operating system security, program security, security management, block chain technologies, and ethical and legal issues in computer security. Prerequisite: COE 370 or COE 371.

**COE 457 Internet and Internet of Things (IoT) Programming (3-1-3).** Introduces Internet and Internet of Things (IoT) programming. Covers the following topics: programming using Internet and IoT protocols, advanced JavaScript and TypeScript programming, NSQL databases, cross-platform web-application development and architectures for Internet of Things. Prerequisites: COE 312 or CMP 256, and COE 370 or COE 371, and CMP 310. Lab/Tech rate A applies.

**COE 481 Real-time Industrial Networks (3-0-3).** Explores industrial computer network principles, commercial industrial networks, third-generation industrial networks, network layout and intrinsic safety considerations, software issues, real-time data processing and case studies. Prerequisite: COE 370 or COE 371.

**COE 490 Design Project I (0-3-1).** Introduces design methodology in computer engineering through lectures and an open-ended, in-depth design project of significance in computer engineering. Includes the design of a system process or component to achieve the functional objectives representative of problems encountered by practicing computer engineers. Requires students to work in teams in close accord with one or more faculty members to define, complete, validate and document their design project. Emphasizes engineering ethics and communication skills. Prerequisites: COE 241, COE 370, CMP 305, ENG 207 and senior standing.

**COE 491 Design Project II (0-6-2).** Continues the work of COE 490 Prerequisite: COE 490.

## CVE Civil Engineering

**CVE 202 Construction Materials Laboratory (0-3-1).** Focuses on the application of basic measurement techniques and instrumentation to the experimental investigation of construction materials: aggregate, bitumen, pavement materials, asphalt mixes, cement, concrete materials, concrete mixes, mild and high tensile steel testing, non-destructive testing. Includes timber and metals tests. Requires written reports covering the planning, execution, results and conclusions of the investigation. Emphasizes teamwork. Prerequisite/concurrent: CVE 224. Lab/Tech fee rate B applies.

**CVE 211 Fundamentals of Graphics and Computer Programming (2-3-3).** Covers graphical communication including lettering, drawing equipment and techniques. Includes the following topics: orthographic projections, sections and technical sketching; isometric and oblique projections; communication and documentation of engineering design through engineering drawing; computer-aided design; and elements of computer programming and problem-solving techniques. Uses computer tools in data analysis, data display and visualization techniques. Prerequisite: NGN 111. Lab/Tech fee rate A applies.

**CVE 220 Statics (3-1-3).** (Equivalent to MCE 220). Covers fundamental concepts and principles of mechanics, vectors and force systems; concepts of free-body-diagram; principle of equilibrium of particles and rigid bodies in two and three dimensions; analysis of structures (trusses, frames and machines); shear and bending moment in beams, center of gravity, centroids and area moment of inertia; and friction. Not open to mechanical engineering students. Prerequisites: PHY 101 and PHY 101L.

**CVE 223 Mechanics of Materials (3-1-3).** (Equivalent to MCE 223). Covers stress and strains; mechanical properties of materials; axial load, torsion, bending and transverse shear; combined loading; stress transformation; deflection of beams and shafts; and buckling of columns. Restricted to students formally admitted to the second-year level in civil engineering. Prerequisite: CVE 220 or MCE 220 or MCE 224.

**CVE 224 Construction Materials and Quality Control (3-0-3).** Examines properties of construction materials (aggregate, Portland cement, admixtures, concrete and bituminous materials used in construction and maintenance of structures, roads and pavements); design of concrete mixes including admixtures; concrete trial mixes on construction site; concrete curing methods; concrete strength and durability; design of paving mixtures; and production, specifications, tests and quality control of various construction materials. Prerequisites: CVE 223 and CHM 101; prerequisite/concurrent: CVE 202.

**CVE 231 Geology (3-0-3).** Covers the nature and structure of earth, formation of rocks, chemical and physical properties of minerals, weathering, volcanoes, earthquakes and tectonic movements, types of mountains and their formation, groundwater and surface water process, and rock mass instabilities. Prerequisite: NGN 110.

**CVE 240 Fluid Mechanics (2-3-3).** (Equivalent to MCE 240). Examines fundamental concepts including properties of fluids (specific gravity, viscosity and surface tension); fluid statics (pressure and its measurement, hydrostatics forces on submerged surfaces, stability of floating bodies); basic equations of motion (continuity, momentum and energy equations, Bernouli's equation); measurement of static and stagnation pressure, velocity and flow rate in closed conduits (internal flow), laminar and turbulent flow; flow over immersed bodies (external flow); lift and drag; and dimensional analysis and dynamic similitude. Restricted to students formally admitted to the second-year level in civil engineering. Prerequisites: CVE 220 and MTH 104. Lab/Tech fee rate B applies.

**CVE 241 Elementary Surveying (3-0-3).** Introduces geodetic positions, coordinate systems, datum, basic measurement procedures and use of surveying instruments. Covers principles and practice in measuring distance, elevation, and angles; and leveling, traverse, and earth work computations. Introduces GPS and GIS. Prerequisite: MTH 104; prerequisite/concurrent: CVE 242.

**CVE 242 Field Plane Surveying (0-3-1).** Covers fundamental principles of surveying; basic measuring procedures and use of surveying instruments; and use of surveying equipment for leveling, traverse and area/volume computations. Prerequisite/concurrent: CVE 241. Lab/Tech fee rate B applies.

**CVE 263 Urban Transportation Planning (3-0-3).** Examines urban transportation system planning techniques: data collection, trip generation, trip distribution, factors underlying the choice of mode, traffic assignment, modeling and evaluation techniques, use of planning software

packages, development of alternatives, and evaluation of civil engineering projects. Introduces Intelligent Transportation Systems (ITS). Restricted to students formally admitted to the second-year level in civil engineering and to students pursuing a minor in transportation systems. Prerequisites: CVE 241 and NGN 111, or TRS 260.

**CVE 267 Civil Engineering Cost Analysis (3-0-3).** Covers economic analysis and evaluation of civil engineering proposals utilizing time-value and related factors, time value of money, worth of investments and economic evaluation of alternative choices, replacement and retention decisions, selection from independent projects, inflation, cost estimating fundamentals, parametric cost estimating, probabilistic cost estimating, depreciation, breakeven analysis and benefit cost analysis. Restricted to students formally admitted to the second-year level in civil engineering. Prerequisite: NGN 111.

**CVE 301 Theory of Structures (3-0-3).** Covers stability and determinacy of structures; force calculation in trusses; axial load, shear and bending moment diagrams for beams and frames; approximate analysis of indeterminate frames; analysis of cables and arches; deflection calculations; influence lines for determinate structures; and analysis of statically indeterminate structures using classical methods. Uses commercial software for structural analysis. Prerequisite: CVE 223.

**CVE 303 Geotechnical Engineering Laboratory (0-3-1).** Includes experiments in soil mechanics. Laboratory experiments cover geotechnical test equipment and techniques. Includes the applications of testing principles to the measurement of fundamental aspects of soil behavior from classification to engineering properties. Emphasizes rigorous techniques to measure mechanical behavior under various boundary conditions. Provides exposure to error estimation. Utilizes standard test methods and equipment to assess physical, mechanical, chemical and hydraulic properties of soils for application in civil engineering design. Includes laboratory work on classification and engineering tests on intact and weathered rock. Prerequisite/concurrent: CVE 331. Lab/Tech fee rate B applies.

**CVE 304 Environmental and Water Engineering Laboratory (0-3-1).** Includes experiments in environmental engineering, hydraulic engineering and surface and ground water hydrology. Includes sampling, physical, chemical and bacteriological analysis of water and wastewater. Utilizes standard test methods and equipment for measurement of important environment parameters. Covers sampling methods and data presentation. Includes experiments in water surface run off and subsurface infiltration and flow, experiments in closed conduit, open channel tests and related hydraulic structures. Prerequisite/concurrent: CVE 351. Lab/Tech fee rate B applies.

**CVE 310 Fundamentals of Structural Dynamics (3-0-3).** Examines fundamental concepts of kinetics of particles and sources and types of dynamic forces in structures. Introduces earthquake nature, causes and effects; types of dynamic forces and the basic concepts of structural dynamics; equations of motion of single degree of freedom systems, free and forced vibration; response to earthquake loading. Introduces multi-degree of freedom systems and applications to civil engineering disciplines. Uses relevant computer modeling and dynamic analysis programs. Prerequisites: CVE 301 and MTH 205.

**CVE 312 Structural Steel Design (3-0-3).** Covers loads on structures; design criteria and philosophies; and analysis and design of structural steel elements found in buildings and bridges including tension members, compression members, beams, columns, beam columns and connections. Requires a design project and use of computer software. Prerequisite: CVE 301.

**CVE 313 Reinforced Concrete Design (3-0-3).** Covers loads on structures; design criteria and factors of safety; analysis and design of reinforced concrete beams, short columns, one-way slabs and footings using ultimate strength method; and bond development of reinforcement. Requires a design project and use of computer software. Prerequisites: CVE 224 and CVE 301.

**CVE 325 Numerical Methods in Engineering (3-1-3).** (Equivalent to MCE 325). Covers basic concepts of computational methods; errors, accuracy and precision; numerical solution of non-linear equations; direct and iterative methods for solving systems of linear algebraic equations; numerical differentiation and integration; and interpolation, approximation and curve fitting. Includes numerical solutions of ordinary differential equations and introduces partial differential equations. Includes applications of computational methods using computers. Prerequisites: CVE 211, MTH 205 and MTH 221. Lab/Tech fee rate A applies.

**CVE 331 Geotechnical Engineering Principles (3-0-3).** Studies physical properties of soils, classification systems, soil structure and soil water systems, effective stress principle and stresses in soil due to applied loads. Includes the following topics: compressibility, consolidation and swell; permeability and seepage analysis; soil compaction; stress-strain-shear strength relationships of soils; failure criteria; direct and triaxial shear testing; and soils used in construction. Introduces lateral earth pressures. Uses computer software for geotechnical analysis. Prerequisites: CVE 223 and CVE 231; prerequisite/concurrent: CVE 303.

**CVE 333 Geotechnical Engineering Design (3-0-3).** Covers subsurface exploration and site investigation and evaluation; bearing capacity of shallow foundations in different types of soils; settlement analysis (consolidation and immediate); design of shallow foundations including footings and raftings; design of deep foundations including driven piles, shafts and drilled piers; pile load tests; end bearing and friction of deep foundations under axial loading; settlement of piles; bearing capacity and settlement of pile groups; piles subjected to lateral loading and moments; and design of pile foundations. Introduces design of retaining walls. Requires extensive use of computer-aided design in team projects. Prerequisite: CVE 331.

**CVE 341 Water Resources Engineering (3-0-3).** Introduces flow of water through pipes and channels, over the ground surface, and through the subsurface. Covers incompressible flow in pipes, methods of energy loss computations, pumps, steady flow in pipe networks, and design of pipe networks using computer applications. Includes open channel hydraulics, design of water supply canals, bridge and culvert hydraulics, and open channel flow modeling. Introduces surface hydrology including runoff modeling. Covers subsurface flow and wells hydraulics. Includes team projects, and analysis and design using computer software. Prerequisite: CVE 240.

**CVE 351 Environmental Engineering (3-0-3).** Covers materials balance, reaction kinetics and reactor theory. Introduces water quality parameters, modeling, and source assessment; and planning and design of water and wastewater treatment methods and unit operations. Includes physical, chemical and biological phenomenon governing water and wastewater treatment steps; air quality standards

and air quality treatment and control; solid waste planning and management; and hazardous waste treatment and management. Prerequisite: CHM 101; prerequisites/concurrent: CVE 304 or CHM 217, and CVE 341 or EWE 331.

**CVE 363 Highway Design (3-0-3).** Explores driver and vehicle characteristics, stopping and passing sight distances, cross section elements, vertical and horizontal alignment, intersections and interchanges, surface drainage, types of pavements, and principles, theoretical concepts and design of flexible and rigid pavements. Prerequisite: CVE 263.

**CVE 367 Project Estimating, Planning and Control (3-0-3).** Covers the application of cost estimating and planning techniques for construction projects. Introduces construction project management; quantity surveying; labor, material and equipment costing; indirect and general overhead costs; preparation of approximate and definitive estimates; work breakdown structures; project scheduling; network modeling; critical path method; program evaluation and review techniques; time-cost tradeoff; earned value; project controls and project closeout. Prerequisite: CVE 267.

**CVE 397 Professional Training in Civil Engineering (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the program by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator for the major. Registration fee applies.

**CVE 410 Computer Methods in Structural Analysis (3-0-3).** Introduces matrix algebra, degrees of freedom and system coordinates. Explores virtual work method, stiffness and flexibility methods, matrix formulation of the stiffness and flexibility methods, direct stiffness method, introduction to finite element method, computer analysis of 2D and 3D framed structures. Emphasizes team-based learning through projects. Prerequisites: CVE 301 and MTH 221.

**CVE 411 Structural Concrete Design (3-0-3).** Introduces flooring and structural systems. Covers design of reinforced concrete members including beams subjected to torsion, two-way slabs, column under biaxial bending, slender columns, combined footings and shear walls. Introduces pre-stressed concrete, pre-stress materials and losses. Includes design of pre-stressed beams and computer analysis and design of structures. Emphasizes team-based learning through specific design projects. Prerequisite: CVE 313.

**CVE 414 Prestressed Concrete Design (3-0-3).** Covers the analysis and design requirements for prestressed concrete members; materials, prestressing systems and methods; prestress losses; flexural design for service stresses at transfer and at service; ultimate flexural and shear strength design; composite construction and secondary moments. Prerequisite: CVE 313.

**CVE 431 Fundamentals of Earthquake Engineering (3-0-3).** Introduces the fundamental principles and practical methods in geotechnical earthquake engineering. Presents basic concepts of vibratory motion, dynamics, seismology, earthquakes and strong ground motion. Develops procedures of deterministic and probabilistic seismic hazard analysis. Explores the concepts of wave propagation that are used to develop procedures for site response analysis and site amplification factors. Prerequisite/concurrent: CVE 331.

**CVE 437 Advanced Concrete Technology (3-0-3).** Covers mix design, production, applications and quality control of high performance concrete in hot and cold climates. Includes the following topics: concrete strength, durability, deterioration, maintenance and repair materials and methods; application of admixtures and cement replacement in various advanced concrete types; and the prediction of service life and cost of repair. Prerequisites: CVE 202 and CVE 224.

**CVE 441 Coastal Engineering (3-0-3).** Covers wave theories and their characteristics; wave transformation (wave refraction, diffraction and reflection); wave forces and concepts and theories of wave structure interactions; water level fluctuations (tides); coastal and ocean structures; design of seawalls, breakwater and shore protection systems; design of selected coastal structures; and hydraulic considerations. Introduces selected coastal engineering problems. Prerequisite: CVE 341.

**CVE 442 Advanced Foundation Engineering (3-0-3).** Includes site investigation with emphasis on in-situ testing. Covers computer-aided profile data reduction and recording; interpretation of field and laboratory data; design of retaining structures, earth structures, braced cut excavations, sheet-pile walls and reinforced earth structures; offshoring; problematic soil and ground improvement; and the design of staged construction embankments. Introduces seismic behavior of ground and geotechnical earthquake engineering, and design with geotextiles. Emphasizes design of locally used geotechnical structures. Requires extensive use of computer-aided design in team-projects. Prerequisite: CVE 333.

**CVE 446 Geotechnical Dam Engineering (3-0-3).** Examines regional geoscience and seismotectonic investigations; related subsurface exploration programs; in-situ permeability testing; and seepage in composite sections, anisotropic and multi-layered materials; flow through earth dams; methods of stability analysis of soils and rocks slopes; design of dam foundations; foundation treatment; and grouting in the ground. Introduces earthquake analysis and design of earth and rockfill dams. Special considerations include liquefaction problems, sinkholes, land subsidence, foundation defects and dispersive soils. Covers compaction methods, monitoring and staged construction. Includes case studies and computer-aided design projects. Prerequisite/concurrent: CVE 331.

**CVE 451 Urban Water Infrastructure Management (3-0-3).** Introduces drinking water, wastewater and stormwater infrastructures. Includes water quality management of water infrastructures, waste solids handling and disposal practices and integrity of water infrastructures, design approach and construction of infrastructure, and operations, maintenance and renewal of water, sewer and stormwater systems. Introduces financial management, asset management, risk management and the use of information technology in water management. Prerequisites/concurrent: CVE 341 and CVE 351.

**CVE 452 Water Supply and Sewerage Engineering (3-0-3).** Introduces water demand, water supply sources, water use trends and forecasting. Includes fundamentals of surface water and groundwater collection and transportation; design of wells and water distribution systems; estimation of industrial, domestic and fire demands; water meters; and leak detection. Identifies processes for sustainable water use and economics of water supply. Covers wastewater generation, construction and maintenance of sanitary sewer and plumbing systems in buildings. Prerequisite/concurrent: CVE 341.

**CVE 456 Traffic Engineering (3-0-3).** Explores characteristics of road users and the characteristics of the traffic stream: speed-flow-density, traffic volume, traffic accidents, travel time and delay, parking, capacity and level of service of freeways, signalized intersections and at-grade intersection

design. Covers transportation models. Prerequisite: CVE 263.

**CVE 457 Airport Planning and Design (3-0-3).** Examines airport master planning, forecasting air travel demand and design of airports, including lighting, terminal facilities, noise-level control, aircraft control, airspace utilization and automobile parking. Prerequisite: CVE 263.

**CVE 463 Construction Management (3-0-3).** Examines management in the construction industry; construction delivery systems; management organizations; construction contracts; preconstruction planning and scheduling; bidding and award; contract administration and control; managing submittals, drawings, communications, progress payments, cash flow and site materials; and progress monitoring and control. Introduces construction quality and safety management. Prerequisite: CVE 367.

**CVE 467 Building Construction Materials and Methods (3-0-3).** Covers traditional and alternative building systems, the principles, materials, methods, codes and standards, and discusses their advantages and limitations. Encompasses aspects of site preparation, excavation and formwork, foundation choices, different elements of frame construction, scaffolding, thermal and moisture protection, electrical wiring, heating ventilation and air-conditioning (HVAC), plumbing, roofing, cladding systems, and external and internal finishes. Prerequisites: CVE 211 and CVE 267.

**CVE 472 Geographic Information Systems (3-0-3).** Introduces the concept and use of Geographic Information Systems (GIS). Covers assorted topics in GIS including map generation and analysis, vector and raster GIS, spatial databases and query, spatial data display, simple spatial analysis, data in GIS, GIS capabilities, GIS data structures and sources of data, GIS tools, GIS analysis, GIS applications and GIS visualization. Prerequisites: CVE 241 and CVE 242, or CVE 236; and senior standing.

**CVE 490 Civil Engineering Design Project I (0-3-1).** Requires preparing a proposal for an open-ended, in-depth design project of civil and/or environmental engineering significance that includes the analysis and design of a civil engineering system meeting desired objectives within one, or more, of the civil engineering practice areas. Requires students to work in close accord with one or more faculty members in a team environment with emphasis on communication, independent study and ethics. The project outcomes must demonstrate that students have attained the level of competency needed for entry into the civil engineering profession. Introduces basic concepts in business, public policy and leadership skills. Prerequisites: ENG 207, PHY 102 and senior standing.

**CVE 491 Civil Engineering Design Project II (0-6-2).** Continues the work of CVE 490. Prerequisite: CVE 490.

## EGM Engineering Management

**EGM 361 Management for Engineers (3-0-3).** Focuses on engineers as managers. Includes the following topics: nature and functions of organizations; the tools of engineering management; engineering organizational models, including cluster and matrix organization; leadership; teamwork and creativity; personnel management; finance; communication skills; and ethical and professional standards. Introduces total quality management. Includes case studies. Prerequisites: NGN 110 and WRI 102.

**EGM 362 Engineering Project Management (3-0-3).** Covers projects in engineering organizations. Includes the following topics: project initiation; effective project management; project life cycle, planning and scheduling; resourcing; cost estimating; and project monitoring and control. Introduces computer packages. Includes case studies. Prerequisites: NGN 110 and ECO 201.

**EGM 364 Engineering Economy (3-0-3).** Explores the economics concepts and theories of planning. Covers the bases and methods of economic analysis of engineering projects and the application of these principles in understanding economic activity of private and public engineering companies at various micro- and macroeconomic levels. Not open to civil engineering or chemical engineering students. Prerequisites: NGN 111 or STA 201, and ECO 201.

## ELE Electrical Engineering

**ELE 211 Electric Circuits I (3-2-3).** Examines physical concepts and mathematical analysis of electric circuits. Includes DC, transient and sinusoidal steady state circuit analysis. Covers single phase AC power analysis. Includes laboratory experiments and use of modern software tools. Prerequisites: PHY 102 and PHY 102L. Lab/Tech fee rate B applies.

**ELE 212 Electric Circuits II (3-2-3).** Covers magnetically coupled inductors and ideal transformers, frequency response analysis, Laplace transform, application of Laplace transform in circuit analysis, two port networks. Introduces three phase circuits. Includes laboratory experiments. Restricted to students formally admitted to the second-year level in electrical engineering, and to students pursuing a minor in electrical engineering or mechatronics engineering. Prerequisites: ELE 211 and MTH 205. Lab/Tech fee rate B applies.

**ELE 225 Electric Circuits and Devices (3-2-3).** Covers electrical quantities and variables; circuit principles; signal processing circuits; DC and AC circuit analysis; and diodes, transistors, operational amplifiers and digital devices. Not open to electrical engineering or computer engineering students. Prerequisites: PHY 102 and PHY 102L. Lab/Tech fee rate B applies.

**ELE 241 Electronics I (3-0-3).** Reviews semiconductor physics. Covers PN junction; diode circuits; special diodes; bipolar junction transistor (BJT); biasing, small signal analysis and design of BJT amplifiers; MOSFET transistor; biasing, simple current mirror; small signal analysis and design of MOSFET amplifiers; optoelectronic devices; and digital electronics. Restricted to students formally admitted to the second-year level in electrical engineering or computer engineering, and to students pursuing a minor in electrical engineering. Prerequisite: ELE 211; prerequisite/concurrent ELE 241L.

**ELE 241L Electronics I Laboratory (0-3-1).** Laboratory to accompany ELE 241. Prerequisite/concurrent: ELE 241. Lab/Tech fee rate B applies.

**ELE 311 Electromagnetics (3-0-3).** Addresses vector algebra and vector calculus. Covers topics related to electrostatic and magnetostatic fields, electric and magnetic properties of media, electric boundary value problems, Maxwell's equations, electromagnetic waves and plane wave propagation, Poynting theorem and transmission line theory. Restricted to students formally admitted to the second-year level in electrical engineering or computer engineering, physics students, and students pursuing a minor in electrical engineering. Prerequisites: MTH 203, MTH 205, PHY 102 and PHY 102L.

**ELE 321 Signals and Systems (3-0-3).** Covers classification and manipulation of continuous-time and discrete-time signals, linear time

invariant system modeling, convolution of discrete-time and continuous signals, Fourier representation of signals (Fourier series, Fourier transform and discrete-time Fourier transform), applications of Fourier representations in signals and systems. Prerequisite: ELE 212.

**ELE 323 Signal Processing (3-0-3).** Covers signal classification and system behavior, impulse response and convolution, signals and systems analysis and representation via the Fourier transform and the Z transform, sampling of band-limited signals, and FIR and IIR Digital filters and their design. Not open to electrical engineering students. Prerequisites: ELE 211 or ELE 225, and MTH 205.

**ELE 324 Digital Signal Processing (3-0-3).** Covers treatment of sampling/reconstruction, quantization, discrete-time signals and systems, digital filtering, Z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications. Prerequisite: ELE 321.

**ELE 332L Measurements and Instrumentation Laboratory (0-3-1).** Includes error analysis, linear displacement transducers, strain gauge, rotational speed measurement, capacitive and inductive transducers, temperature measurement, measurement of pressure and flow, and ultrasonic measurement systems. Prerequisite: ELE 341. Lab/Tech fee rate B applies.

**ELE 341 Electronics II (3-0-3).** Covers differential pair, operational amplifiers, power amplifiers, review of Bode Plots, frequency response characteristics of amplifiers, feedback and stability, oscillators, active filters, timing circuits, digital to analog conversion (D/A), and analog to digital conversion (A/D). Prerequisite: ELE 225 or ELE 241.

**ELE 341L Electronics II Laboratory (0-3-1).** Laboratory to accompany ELE 341. Prerequisite: ELE 241L; prerequisite/concurrent: ELE 341. Lab/Tech fee rate B applies.

**ELE 351 Electrical Energy Conversion (3-2-3).** Covers magnetic circuits, single-phase transformer and equivalent circuit, autotransformer, basic concepts of electromechanical energy conversion, and DC and AC machines modeling and steady state analysis. Includes laboratory experiments on transformers and electrical machines. Prerequisite: ELE 212 or ELE 225. Lab/Tech fee rate B applies.

**ELE 353 Control Systems I (3-0-3).** (Equivalent to MCE 410). Examines mathematical models of systems, feedback control system characteristics, transient response analysis, performance and stability of feedback control systems, root locus analysis, frequency response analysis and design of feedback control systems. Prerequisite: ELE 212; prerequisite/concurrent: MCE 224.

**ELE 353L Control Systems I Laboratory (0-3-1).** Laboratory to accompany ELE 353. Prerequisite: ELE 353. Lab/Tech fee rate B applies.

**ELE 360 Probability and Stochastic Processes for Electrical Engineers (3-0-3).** Covers concepts of probability theory, random variables, stochastic processes and queuing systems emphasizing their applications in electrical engineering. Investigates electrical engineering systems and applications as well as networks performance via discrete-event simulation. Not open to students who have completed COE 375. Prerequisites: NGN 111 or STA 201, and ELE 323 or MTH 312 or prerequisite/concurrent: ELE 321.

**ELE 361 Communications (3-0-3).** Covers signals and systems concepts, communication systems and signal transmission through linear systems; continuous wave modulation schemes including amplitude modulation (AM), frequency modulation (FM) and phase modulation (PM); detection schemes for analog modulation systems and superheterodyne receivers; and noise modeling and performance of various analog modulation schemes in the presence of noise. Includes fundamentals of digital communications. Prerequisite: ELE 321 or ELE 323; prerequisite/concurrent: ELE 360.

**ELE 361L Communications Laboratory (0-3-1).** Laboratory to accompany ELE 361. Prerequisite: ELE 361. Lab/Tech fee rate B applies.

**ELE 371 Power Systems Analysis (3-0-3).** Examines power system concepts and per unit quantities; transmission line, transformer and rotating machine modeling; steady-state analysis and power flow; balanced fault analysis; theory of symmetrical components; and unbalanced fault analysis. Prerequisite: ELE 351; prerequisite/concurrent: MTH 221.

**ELE 371L Electric Machines and Power Systems Laboratory (0-3-1).** Laboratory to accompany ELE 371. Prerequisite/concurrent: ELE 371. Lab/Tech fee rate B applies.

**ELE 397 Professional Training in Electrical Engineering (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the department by the beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of the internship coordinator for the major. Registration fee applies.

**ELE 432 Medical Instrumentation (3-0-3).** (Equivalent to BME 420). Examines principles of medical instrumentation. Covers biomedical sensors and transducers; temperature, displacement, acoustical, chemical and radiation measurements; bio-potential amplifiers and signal processing; origin of bio-potentials; bio-potential electrodes; measurement of bio-potentials such as ECG, EEG and EMG; blood pressure measurements; and electrical safety. Prerequisite: ELE 341.

**ELE 439L Medical Electronics Systems Laboratory (0-3-1).** (Equivalent to BME 424L). Explores data acquisition tools, medical signal processing, biopotential amplifiers, biopotentials, bioimpedance measurements, blood pressure measurements, respiratory measurements, ultrasonic measurements and electrical safety. Prerequisite/concurrent: ELE 432. Lab/Tech fee rate B applies.

**ELE 440 Radio Transceivers Design and Analysis (3-0-3).** Covers transmitter and receiver architectures, link budget, noise analysis, linearity analysis, case study (transmitter/ receiver design), linear amplifier design, network analysis, microwave measurements for transmitters' characterization, EDA tools with application to system level design and analysis. Prerequisite/concurrent: ELE 341.

**ELE 441 Microelectronic Devices (3-0-3).** Covers conceptual and functional description of the physics, characteristics and fabrication of microelectronic devices as it applies to current and future integrated circuits (IC) and systems. Includes properties and dynamics of semiconductor carriers, P-N junctions, MOSFETs, BJTs and modern FETs. Uses of the state-of-the-art technology CAD/CAE simulation tools, analytical techniques for device design, layout, fabrication and testing. Prerequisite: ELE 341.

**ELE 444 Control Systems II (3-0-3).** Covers state-space modeling and analysis, controllability, observability, state feedback design and pole placement, dynamic observers, output feedback design and stability analysis. Prerequisite: ELE 353 or MCE 410.

**ELE 451 Wireless Communications (3-0-3).** Provides an overview of wireless networks, design considerations of cellular systems, frequency reuse, multiple access interference, wireless channel characterization, Rayleigh fading, shadowing, modulation techniques for mobile radio, diversity schemes, multiple access techniques, wireless systems and standards. Prerequisite: ELE 361.

**ELE 452 Digital Communications (3-0-3).** Covers model of digital communication systems, base-band transmission and line coding techniques, geometric interpretation of signals, band-pass transmission and digital modulation techniques, optimum detection of known signals in AWGN channels, error correcting codes, and modulation and coding trade-off. Prerequisite: ELE 361.

**ELE 453 Microwave Engineering (3-0-3).** Examines electromagnetic plane waves, microwave transmission lines, Smith charts and stubs, microwave waveguides and components, microwave measurements and applications, and microwave generators. Prerequisite: ELE 311.

**ELE 454 Antennas and Wave Propagation (3-0-3).** Covers radiation pattern, directivity and gain, half-power beam width and beam efficiency, antenna bandwidth, polarization, input impedance, radiation efficiency, wire antennas, loop antennas, array antennas, aperture antennas and reflector antennas. Prerequisite: ELE 311.

**ELE 456 Pattern Recognition (3-0-3).** Covers fundamentals of pattern recognition. Explores the following topics: Bayesian decision theory and parameter estimation, maximum likelihood estimation, linear discriminant analysis**,** Fisher discriminant analysis**,** dimensionality reduction via principle component analysis, and neural networks. Includes unsupervised learning and clustering. Prerequisites: ELE 360, CMP 120 and MTH 221.

**ELE 457 Satellite Communications (3-0-3).** Focuses on satellite communications. Covers Kepler's laws of orbital motion, satellite's look angles calculations, satellite subsystems and transponders classification, satellite antennas, link budget analysis, multiple access techniques and modulation. Prerequisite: ELE 311; prerequisite/concurrent: ELE 361.

**ELE 458 Multimedia Communications and Networking (3-0-3).** Provides an overview of multimedia information (text, video, audio and images). Explains the fundamentals of image and video compression. Introduces underlying concepts and principles of multimedia technologies and networking. Demonstrates basic understanding of Quality of Service (QoS) and QoS Routing network protocols, routing, operating systems and human computer interaction. Includes multimedia streaming standards and techniques over wired and wireless networks. Prerequisite/concurrent: ELE 360 or COE 375.

**ELE 458L Communications Systems Laboratory (0-3-1).** Examines practical aspects of digital communications, antennas and microwave engineering. Topics include pulse code modulation (PCM), modulation schemes, pulse shaping, noise effects, optical fiber link, time division multiplexing, antenna parameters measurements, microwave reflection and transmission parameter measurements, and real-time DSP programming and applications. Prerequisites: ELE 311 and ELE 361; prerequisite/concurrent: ELE 324. Lab/Tech Fee Rate B applies.

**ELE 459 Introduction to Radar Systems (3-0-3).** Focuses on radar systems and their applications. Includes the following topics: the radar range equation, detection fundamentals, the radar cross-section, antennas, radar transmitters and receivers, pulse Doppler radars, moving target indictors, tracking radars and synthetic aperture radars. Prerequisite: ELE 311.

**ELE 471 Digital Control Systems (3-0-3).** Covers discrete-time system models, open loop and closed-loop discrete-time systems, time-response characteristics, stability analysis techniques, digital controller design and implementation techniques, state-space representations of discrete-time systems, state-feedback and pole-placement design. Prerequisite: ELE 353; prerequisite/concurrent: ELE 324.

**ELE 476L Instrumentations and Control Systems Laboratory (0-3-1).** Reviews measurement systems. Explores programmable logic controllers programming, PC-based data acquisition and control, Electro-Pneumatic System Control and Electro-Hydraulic System Control. Prerequisites: ELE 332L and ELE 353L. Lab/Tech fee rate B applies.

**ELE 478L Design Laboratory (0-3-1).** Focuses on the development of advanced engineering solutions to contemporary challenges in a collaborative environment. Considers the complete product development cycle, including requirements specifications, system decomposition, design of subsystems and interfaces, experimentation, simulation for design validation, and system integration. Prerequisite: permission of the department. Lab/Tech fee rate B applies.

**ELE 481 Power System Protection (3-0-3).** Covers unsymmetrical fault analysis, fuses, voltage and current transducers, fundamental relay operating principles and characteristics, over current protection, comparators and static relay circuits, differential protection and its application to generators, transformers and bus bars, motor protection, system grounding, standard protective schemes for system coordination of relays. Prerequisite: ELE 371.

**ELE 482 Electric Power Distribution Systems (3-0-3).** Examines concepts and techniques associated with the design and operation of electrical distribution systems. Includes the following topics: load characteristics, distribution substations, choice of voltage levels, loss minimization and voltage control, calculation of impedances of unbalanced three-phase systems, and analysis techniques of radial systems. Prerequisite: ELE 371.

**ELE 485 Power Electronics (3-0-3).** Covers operating characteristics of power semiconductor devices such as bipolar junction transistors (BJTs), insulated gate bipolar transistors (IGBTs), metal-oxide semiconductor field-effect transistors (MOSFETs) and Thyristors. Covers the fundamentals of power converter circuits including dc/dc converters, phase controlled ac/dc rectifiers and dc/ac inverters. Addresses practical issues in the design and implementation of power converters. Prerequisites: ELE 212 and ELE 241, or ELE 225.

**ELE 486 Electric Drives (3-0-3).** Covers the application of semiconductor switching power converters to adjustable speed DC and AC motor drives. Includes the following topics: steady state theory and analysis of electric motion control in industrial, robotic and traction systems. Prerequisites: ELE 225 or ELE 241, and ELE 351.

**ELE 487 Power Conversion in Renewable Energy Systems (3-0-3).** Covers renewable energy conversion systems. Introduces modeling and control of renewable energy sources such as wind and solar energy systems. Addresses power electronics topologies and interfaces for renewable energy systems. Covers integration of renewable energy systems with the distribution grid. Prerequisite: ELE 351.

**ELE 488L Power Engineering Laboratory (0-3-1).** Explores various power systems and power electronics

applications including issues related to power transmission and distribution and adjustable speed motor drives. Prerequisites: ELE 371 and ELE 371L. Lab/Tech fee rate B applies.

**ELE 490 Electrical Engineering Design Project I (0-6-2).** Introduces design methodology in electrical engineering through lectures and an open-ended, in-depth design project of significance in electrical engineering. The project includes the design of a system, process or component to achieve the functional objectives representative of problems encountered by practicing engineers. Realistic constraints and standards are considered in the design. Collaborative teams define, complete, validate and document their design project under the supervision of one or more faculty members. Emphasizes engineering ethics and communication skills. Prerequisites: ENG 207, senior standing and permission of the department.

**ELE 491 Electrical Engineering Design Project II (0-6-2).** Continues the work of ELE 490. Prerequisite: ELE 490.

## EWE Environmental and Water Engineering

**EWE 331 Introduction to Environmental and Water Engineering (3-0-3).** Introduces different components of water resources engineering and environmental engineering, environmental sustainability, environmental and social impact assessment, and environmental risk assessment. Covers surface and groundwater hydrology, quantity and quality of water resources, water supply systems and pollution originating from air, noise and solid waste. Prerequisite: CHM 101.

**EWE 333 Water Quality and Treatment (3-0-3).** Introduces water quality criteria, standards, water sampling and testing methods. Covers pollution sources in water bodies and their impacts on aquatic life. Covers water demand, forecasting and waste generation, and provides a guide to selecting water and wastewater treatment processes. Introduces resource recovery options from water and wastewater treatment facilities. Introduces water re-use options, the importance of pretreatment and quality requirements. Prerequisite: CHM 101.

## INE Industrial Engineering

**INE 201 Introduction to Industrial Engineering (2-0-2).** Introduces the principles and practices of industrial engineering (IE). Covers IE concepts, tools, and techniques. Includes the history of IE, work methods, ergonomics, facility location and layout, demand forecasting, production planning and inventory management, quality management, supply chain management, leadership and ethics. Prerequisite: NGN 110; prerequisites/concurrent: WRI 102 and STA 201.

**INE 222 Operations Research I (3-1-3).** Introduces deterministic models in operations research with special emphasis on linear programming. Covers simplex method, duality, sensitivity analysis, transportation and assignment problems, shortest path problem, CPM/PERT, maximum flow problem, and minimum spanning tree problem. Provides real modeling of various industrial problems as linear programs. Prerequisites: INE 201 and MTH 221.

**INE 301 Manufacturing Processes for Industrial Engineers (2-3-3).** Provides the fundamentals of the economical manufacturing of products. Encompasses many manufacturing processes including casting, material removal processes, metal forming and assembly. Provides hands-on experience in metrology, machining, process planning and other manufacturing technologies. Restricted to students formally admitted to the second-year level in industrial engineering. Not open to students who have completed MCE 331. Prerequisites: MCE 216L, MCE 224 and MCE 230. Lab/Tech fee rate B applies.

**INE 311 Quality Engineering (3-0-3).** Emphasizes the importance of quality management and control. Deals with statistical methods relevant to process control, control charts for variables and attributes, process capability analysis and acceptance sampling plans. Introduces process improvement techniques and six sigma concepts and their applications. Prerequisites: INE 301 and STA 201.

**INE 322 Operations Research II (3-1-3).** Covers deterministic models in operations research and their solution methods. Introduces integer programming formulation and branch and bound method, deterministic dynamic programming, nonlinear programming formulation and unconstrained and constrained optimization techniques. Provides real applications of integer, dynamic and nonlinear programs to industrial and engineering problems. Restricted to students formally admitted to the second-year level in industrial engineering. Prerequisite: INE 222; prerequisite/concurrent: MTH 203. Lab/Tech fee rate A applies.

**INE 323 Stochastic Processes and Simulation (3-2-3).** Introduces stochastic processes and simulation modeling and techniques. Covers discrete and continuous Markov chains, Poisson processes, renewal reward processes, discrete event simulation, simulation languages, model verification and validation. Discusses applications to queuing, reliability and inventory systems. Prerequisites: INE 222 and STA 201. Lab/Tech fee rate A applies.

**INE 331 Analysis of Production Systems (3-0-3).** Covers design and analysis of production systems. Introduces the managerial concepts and quantitative techniques required in production planning and inventory control. Includes aggregate production planning, master production scheduling, material requirement planning, single and multiple products inventory control in both certain and uncertain environments. Restricted to students formally admitted to the second-year level in industrial engineering and to students minoring in engineering management. Prerequisites: INE 222 and STA 201.

**INE 332 Analysis of Supply Chains (3-0-3).** Presents various concepts, tools and techniques of supply chain management (SCM). Deals with development and application of supply chain decision models with special emphasis on supply network design, forecasting, supply chain performance metrics, transportation and green supply chain. Explores various SCM initiatives such as vendor managed inventory, postponement, consignment stock and third-party logistics. Prerequisite: INE 331; prerequisite/concurrent: INE 322.

**INE 333 Facility Design and Operations (3-0-3).** Deals with principles and practices of facility design and planning and materials handling equipment for manufacturing and service systems. Includes analytical approaches in site location, facility design and layout, materials handling and storage systems. Emphasizes quantitative methods for warehouse layout and facility location theory. Prerequisite: INE 331.

**INE 397 Professional Training in Industrial Engineering (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the department by the

beginning of the following term. Graded as Pass/Fail. Prerequisites: Junior II standing and approval of internship coordinator for the major. Registration fee applies.

**INE 413 Maintenance Engineering (3-0-3).** Covers maintenance workload analysis and calculations, capacity planning of maintenance resources, maintenance work scheduling, maintenance auditing and the measurement of maintenance operations performance, and computerized maintenance management systems (CMMS). Explores recent maintenance concepts and techniques such as predictive maintenance and enterprise asset management. Prerequisites: INE 322 and INE 323.

**INE 415 Design of Experiments (3-0-3).** Introduces the planning, design and statistical analysis of experiments. Includes analysis of variance (ANOVA), randomized block design, factorial and fractional design, random and mixed models, and response surface methods. Stresses the application of the learned techniques to various engineering problems. Prerequisite: INE 311.

**INE 416 Reliability Engineering (3-0-3).** Covers the concepts of reliability and failure analysis. Addresses hazard and reliability functions, reliability data analysis and reliability modeling. Explores recent reliability concepts and techniques such as reliability-centered maintenance. Prerequisite: INE 323.

**INE 417 Six Sigma Methodology (3-0-3).** Covers the concepts of Six Sigma methodology for both manufacturing and service organizations. Introduces lean, six sigma and the DMAIC problem-solving methodology. Discusses continuous process improvement techniques such as process definition, process flow diagrams, data collection, measurement techniques, causes of process variation, Pareto diagrams, cause and effect diagrams, and statistical-based techniques. Prerequisite: INE 311.

**INE 425 Decision Analysis (3-0-3).** Introduces judgment and decision making of individuals, groups and organizations. Includes structured decision problems, decision trees, Bayesian decision analysis, utility theory and multi-criteria decision making. Covers practical applications from various engineering areas. Prerequisite: INE 323.

**INE 431 Industrial Scheduling (3-0-3).** Examines scheduling applications in manufacturing and services. Covers practical scheduling problems such as single machine, parallel machines, flow shop, job shop and project scheduling with unconstrained and constrained resources. Discuses both exact and approximate procedures to solve such problems. Prerequisite: INE 332.

**INE 433 Logistics Engineering (3-0-3).** Provides an overview of transportation activities related to design, evaluation and performance of logistics systems. Covers the physical and information flows in supply chains and the economic drivers of logistic choices. Addresses methods to analyze and improve logistics and transportation systems, technology and infrastructure. Prerequisite: INE 332.

**INE 435 Warehousing Systems (3-0-3).** Offers an overview of the design and management of warehousing systems. Includes warehousing management systems, warehouse operations, packaging, warehouse location analysis and material handling. Prerequisite: INE 331.

**INE 439 Fundamentals of Manufacturing Systems (3-0-3).** Covers fundamentals and basic principles associated with manufacturing systems and their automation. Discusses quantitative models and metrics to describe and compare production performance in various types of manned and automated systems. Includes manned and automated single station, assembly and production lines; group and flexible manufacturing systems; material handling systems; process planning and control; and lean and sustainable manufacturing. Not open to students who have completed MCE 439. Prerequisite: INE 301.

**INE 450 Safety Engineering (3-0-3).** Introduces safety regulations and standards, industrial hazard avoidance concepts and techniques, and plant safety applications. Covers process safety, analytical trees and fault tree analysis, risk assessment, and emergency planning. Prerequisite: INE 311.

**INE 460 Industrial Resources Planning (3-0-3).** Provides an overview of Enterprise Resource Planning (ERP) systems. Focuses on how production and related processes interact in an integrated environment. Covers financial and management accounting, purchase-to-pay, plan-to-produce, order-to-cash, and enterprise asset management. Discusses case studies and real-life applications. Not open to students who have completed MGT 315. Prerequisite: INE 331 or EGM 364.

**INE 490 Senior Design Project I (0-3-1).** Covers problem-solving methodology through an open-ended, in-depth design project within the field of industrial engineering. Applies industrial engineering-specific techniques and concepts to problem definition, design and analysis, and evaluation of alternatives. Emphasizes teamwork, engineering ethics, and the skills and abilities necessary for entry into the industrial engineering profession. Addresses the role of effective communication through a report presented orally and in writing. Prerequisites: ENG 207, senior standing, and permission of the department.

**INE 491 Senior Design Project II (0-6-2).** Continues the work of INE 490. Prerequisite: INE 490.

## MCE Mechanical Engineering

**MCE 216L Introduction to Engineering Drawing and Workshop (0-3-1).** Covers descriptive geometry, orthographic projections, and computer-aided drafting using commercial computer-aided design software. Introduces the use of basic machines, the development of hand skills and safety in the workshop. Covers basic hand tools, basic machining operations, welding, casting, woodwork, sheet metal work and measuring instruments. Lab/Tech fee rate B applies.

**MCE 220 Statics (3-1-3).** (Equivalent to CVE 220). Covers fundamental concepts and principles of mechanics, vectors and force systems. Topics include concepts of free-body-diagram; principles of equilibrium of particles and rigid bodies in two and three dimensions; analysis of structures: trusses, frames and machines; shear and bending moment in beams; center of gravity; centroids; area moment of inertia; and friction. Not open to civil engineering students. Prerequisites: PHY 101 and PHY 101L.

**MCE 222 Dynamics (3-1-3).** Examines fundamental concepts of kinematics and kinetics with application to motion of particles and plane motion of rigid bodies. Includes the following topics: rectilinear and curvilinear motion of particles; Newton’s second law, impulse and momentum methods; impact, dynamics of systems of particles; kinematics of rigid bodies; plane motion of rigid bodies; forces and accelerations; and energy and momentum methods. Restricted to students formally admitted to the second-year level in mechanical engineering, and to students pursuing a

minor in mechanical engineering. Prerequisites: MCE 220 and MTH 205.

**MCE 223 Mechanics of Materials (3-1-3).** (Equivalent to CVE 223). Covers stress and strain; mechanical properties of materials; axial load, torsion, bending and transverse shear; combined loadings; stress transformation; deflection of beams and shafts; and buckling of columns. Restricted to students formally admitted to the second-year level in mechanical engineering, and to students pursuing a minor in mechanical engineering or mechatronics engineering. Prerequisite: MCE 220 or MCE 224.

**MCE 224 Engineering Mechanics–Statics and Dynamics (3-1-3).** Covers statics of particles and rigid bodies, vector mechanics, free body diagrams, two-and-three-dimensional force equilibrium systems, truss structures and frames, friction, centroid and moment of inertia, dynamics of particles in rectilinear and curvilinear motions, Newton's second law, considerations of work and energy, and kinematics of rigid bodies. Not open to mechanical engineering or civil engineering students. Prerequisites: MTH 104, PHY 101 and PHY 101L.

**MCE 226L Computer Applications in Mechanical Engineering I (0-3-1).** Covers Boolean algebra, numbering systems, basic computer hardware, C-programming with focus on input-output, logic statements, loops, arrays, pointers and computer interfacing. Lab/Tech fee rate A applies.

**MCE 230 Materials Science (3-0-3).** Introduces material science; relationships between structure and properties of materials; atomic bonding, crystalline structures, crystal defects and imperfections; phase diagrams and equilibrium; microstructural development; properties of engineering materials; and corrosion. Prerequisite: CHM 101.

**MCE 236L Solid Modeling (0-3-1).** Covers dimensioning, an introduction to fits and tolerances, detailed and assembly drawings, solid modeling and computer-aided drafting using commercial computer-aided design software. Prerequisite: MCE 216L. Lab/Tech fee rate A applies.

**MCE 240 Fluid Mechanics (3-1-3).** (Equivalent to CVE 240). Covers fundamental concepts and properties of fluids; fluid statics, forces on planar and curved surfaces, and buoyancy; kinematics of fluid motion; conservation equations with applications; continuity, momentum and energy equations, and Bernoulli's equation; velocity and flow rate measurements; dimensional analysis and similitude; and head losses in pipes. Restricted to students formally admitted to the second-year level in mechanical engineering, and to students pursuing a minor in mechanical engineering or a minor in mechatronics engineering. Prerequisites: MCE 220 or MCE 224, and MTH 104.

**MCE 241 Thermodynamics I (3-1-3).** (Equivalent to CHE 214). Covers basic concepts of thermodynamics, properties of matter, processes and cycles, energy transfer, first law of thermodynamics for closed systems and control volumes, second law of thermodynamics, introduction to cycle analysis, entropy and exergy analyses and engineering applications. Not open to chemical engineering students. Prerequisites: PHY 101 and PHY 101L.

**MCE 311 Engineering Measurements (2-3-3).** Examines basic concepts of measuring methods; static and dynamic characteristics of signals; types of errors; assessing and presenting experimental data; uncertainty analysis; measurement system behavior; sampling; signal conditioning; data acquisition; and selection and use of temperature, pressure, fluid flow, force, stress, strain, torque and power instrumentation. Includes laboratory experiments with emphasis on fluid flow experiments, temperature measurements, motion measurements and solid mechanics experiments. Prerequisites: MCE 222, MCE 240, ELE 225 and NGN 111. Lab/Tech fee rate B applies.

**MCE 321 Mechanical Design I (3-0-3).** Examines the process of materials selection in design. Explores the concepts of stress, strain and deformation analysis of solid elements as applied to mechanical design, and the analysis of long and intermediate compression members. Includes design to prevent static and fatigue failures. Covers the design of mechanical elements, including power screws, bolted and welded joints and springs. Prerequisites: MCE 223 and MCE 230; prerequisite/concurrent: MCE 236L.

**MCE 322 Mechanical Design II (3-0-3).** Covers the design of clutches, brakes and couplings; power transmission equipment (shafts, axles and spindles); flexible mechanical elements (flat and V-belts, wire ropes and chains); rolling and journal bearings; spur, helical, bevel and worm gears; and utilization of commercial computer-aided design software. Requires a design project. Prerequisite: MCE 321; prerequisite/concurrent: MCE 331.

**MCE 325 Numerical Methods in Engineering (3-0-3).** (Equivalent to CVE 325). Covers basic concepts of computational methods; error analysis; numerical solutions of linear and non-linear algebraic equations; numerical approximations: regression and interpolation; numerical differentiation and integration; numerical solution of ordinary differential equations: initial and boundary value problems, eigenvalue problems; introduction to numerical solution of partial differential equations; and engineering applications using software. Prerequisites: MCE 326L, MTH 205 and MTH 221.

**MCE 326L Computer Applications in Mechanical Engineering II (0-3-1).** Covers Matlab programming software, input-output, loops functions, s-functions and embedded Matlab functions. Introduces Simulink Matlab toolbox for mechanical simulations. Includes a term project on interfacing a mechanical system to computer hardware. Prerequisite: MCE 226L. Lab/Tech fee rate A applies.

**MCE 328 Dynamic Systems (3-0-3).** Covers modeling and analysis of mechanical, electromechanical and fluidic systems. Covers forced and free vibrations in single and multiple degree-of-freedom dynamic systems, energy storage and dissipation, transfer functions, state space model representations, system stability, and time domain and frequency domain analysis. Utilizes block diagram simulation tools. Prerequisites: MCE 222, MCE 326L and ELE 225.

**MCE 331 Manufacturing Processes (3-0-3).** Covers the fundamentals of manufacturing processes, including casting, forming, welding and machining operations. Introduces basics of economics of metal cutting, statistical quality control, non-metals manufacturing and other contemporary topics in manufacturing. Restricted to students formally admitted to the second-year level in mechanical engineering. Not open to students who have completed INE 301. Prerequisites: MCE 216L, MCE 220 or MCE 224, and MCE 230.

**MCE 332L Materials and Manufacturing Processes Laboratory (0-3-1).** Covers experimental determination of mechanical properties of engineering materials. Includes experiments covering different manufacturing processes such as casting, welding, forming and machining. Introduces new experiments on contemporary topics in materials and manufacturing. Prerequisite/concurrent: MCE 331. Lab/Tech fee rate B applies.

**MCE 341 Thermodynamics II (3-0-3).** Covers energy system analysis including modern power cycles, refrigeration and heat pump cycles;

Maxwell relations and development of thermodynamic properties; thermodynamics of non-reacting and reacting mixtures of real and ideal gases; psychrometry and air conditioning processes; combustion fundamentals and chemical reactions. Restricted to students formally admitted to the second-year level in mechanical engineering, and to students pursuing a minor in mechanical engineering or a minor in renewable energy. Prerequisite: MCE 241.

**MCE 344 Heat Transfer (3-0-3).** (Equivalent to CHE 307). Covers mechanisms of heat transfer, steady-state conduction in various geometries, electric network analogy, fins, numerical methods in heat transfer, transient conduction, natural and forced convection, internal and external heat transfer, heat exchanger analysis, and fundamentals of thermal radiation. Prerequisites: MCE 240 and MCE 241.

**MCE 345L Thermofluids Laboratory (0-3-1).** Includes the experimental evaluation and analysis of the performance of energy systems, the thermal conductivity of solids and fluids, and the performance curves of pumps; and experiments on fluid flow, heat exchangers, cooling towers, internal combustion engines, and refrigeration and air conditioning systems. Prerequisites/concurrent: MCE 341 and MCE 344. Lab/Tech fee rate B applies.

**MCE 397 Professional Training in Mechanical Engineering (0-0-0).** Requires a minimum of five weeks of approved professional experience. Work undertaken must be documented in a formal report to the department by the beginning of the following term. Prerequisites: Junior II standing and approval of internship coordinator for the major. Registration fee applies.

**MCE 410 Control Systems (3-0-3).** (Equivalent to ELE 353). Covers feedback system response, feedback control system characteristics, performance and stability of feedback control systems, root-locus techniques, frequency domain analysis and design of feedback control systems. Prerequisites: MCE 311 and MCE 328.

**MCE 415L Dynamics and Control Systems Laboratory (0-3-1).** Covers experiments on system dynamics, vibration and control systems. Includes experiments on dynamic systems' response in the time and frequency domains, and open loop and closed loop control of various mechanical systems. Uses CAD software for dynamic response and controller design. Prerequisite/concurrent: MCE 410. Lab/Tech fee rate B applies.

**MCE 416 Kinematics and Dynamics of Machinery (3-0-3).** Explores kinematics and dynamic analysis and synthesis of linkages (displacement, velocity, acceleration and force analysis), cam-follower, gear-train systems, and balancing of rotating systems. Prerequisite/concurrent: MCE 328.

**MCE 418 Vehicle Dynamics (3-0-3).** Focuses on the development of dynamics models and equations of motion for road vehicles. Covers analysis of tire behavior, acceleration and braking performance, road loads, and steady-state cornering models. Examines vehicle suspension design and steering system arrangement impact on vehicle performance. Prerequisite: MCE 328.

**MCE 423 Mechanical Vibrations (3-0-3).** Provides a review of single and two degree-of-freedom vibration time and frequency response (free, transient and harmonic forcing). Includes analysis of multi-degree of freedom system (mass, stiffness and damping matrices). Covers modal analysis and frequency response functions (FRF), vibration analysis of continuous structures and finite element method. Covers vibration measurements and testing: vibration signal analysis, vibration isolation techniques, vibration measurements of active structures, including vibrating machines and rotating machinery. Prerequisite: MCE 328.

**MCE 434 Fundamentals of Computer-Aided Design and Manufacturing (2-3-3).** Introduces computer-aided design (CAD) and computer-aided manufacturing (CAM) technologies. Includes the following topics: the role of CAD/geometric modeling, parametric representation of curves and surfaces, viewing transformations, finite element analysis and optimization techniques, computer numerical control (CNC), part programming, and introduction to rapid prototyping. Prerequisites: MCE 326L and MCE 331. Lab/Tech fee rate B applies.

**MCE 435 Advanced Mechanics of Materials (3-0-3).** Examines basic material properties and their use in design. Includes the following topics: stress-strain-temperature relations, inelastic material behavior, energy methods, torsion of non-circular bars, non-symmetric bending of straight beams, curved beam theory and thick-walled cylinders. Prerequisite: MCE 321.

**MCE 438 Inspection and Nondestructive Testing (3-0-3).** Provides the skills needed to interpret codes and procedures in the fields of nondestructive testing (NDT). Covers NDT management and certification programs; basic principles of defect probability of detection (POD); surface inspection methods such as visual, penetrant, magnetic and eddy current testing; and volumetric inspection methods such as ultrasonic and radiographic testing. Designs inspection techniques and analyzes inspection results. Prerequisites: MCE 311, MCE 322 and senior standing.

**MCE 439 Computer Integrated Manufacturing (3-0-3).** Covers fundamentals and principles associated with computer integrated manufacturing (CIM). Includes the following topics: computer-aided process planning (CAPP), production planning and control, programming principles of numerical controlled and computer numerical controlled systems, manufacturing systems design, manufacturing cells and flexible manufacturing systems. Not open to students who have completed INE 439. Prerequisite: MCE 331.

**MCE 445 Energy Systems (3-0-3).** Covers types of power plants, thermodynamics of power plants, combined power plants, systems components, design parameters, plant evaluation, efficiency calculations methods, modifications to improve system performance, cogeneration plants, thermodynamics and economics of cogeneration plants, system equipment, practical schemes of cogeneration plants, power plant economics, power plant planning, design concepts, power plant control, burner management and environmental impact of power plants. Prerequisites: MCE 341 and MCE 344.

**MCE 446 Refrigeration and Air Conditioning (3-1-3).** Introduces ventilation, air conditioning and refrigeration; classification of air conditioning systems and selection; applied psychrometrics, design conditions, human thermal comfort and indoor air quality; heating and cooling loads calculations; vapor compression refrigeration cycles; refrigeration equipment and systems; and heating equipment and systems, air distribution systems and duct design. Addresses American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards. Covers commercial software applications used to design conventional and nonconventional systems. Prerequisites: MCE 341 and MCE 344. Lab/Tech fee rate A applies.

**MCE 447 Internal Combustion Engines (3-0-3).** Covers fundamental principles of engine operation and applications, engine classifications, engine design and operating parameters, engine cycles, thermo-chemistry and fuels, air and fuel

induction systems, fluid motion within combustion chambers, combustion in spark ignition engines, combustion in compression ignition engines, exhaust system, engine emission and air pollution, methods of emission control, engine friction and lubrication, and engine operating characteristics. Introduces modeling of real engine flow and combustion processes, as well as new trends in internal combustion engines. Prerequisite: MCE 341.

**MCE 450 Energy Conservation and Management (3-0-3).** Analyzes energy systems, including fossil fuels, steam, cogeneration, waste heat recovery, refrigeration and air conditioning systems; total energy management; energy management organization and approach; energy conservation in electrical load; lighting, building envelop, and insulation; economic energy analysis; energy auditing; monitoring and targeting; technical approaches and analyses; control; and energy management systems. Prerequisite: MCE 341.

**MCE 451 Renewable Energy Systems (3-0-3).** Evaluates the effects of fossil fuels-based energy systems on the environment and society. Focuses on the fundamentals and main characteristics of renewable energy technologies such as solar (thermal and photovoltaic), hydropower, wind, geothermal, biomass, ocean thermal, wave and tidal energies. Addresses comparative environmental assessments between renewable energy systems and conventional fossil fuel systems. Focuses on the design of renewable/hybrid energy systems that are economically feasible, have a minimal impact on the environment and meet specific energy demands. Prerequisite: MCE 241.

**MCE 452 Fuel Cells and Hydrogen Systems (3-0-3).** Covers the basic concepts of fuel cells and fuel cell stacks. Discusses the design of various types of fuel cells such as phosphoric acid, alkaline, proton exchange membrane, molten carbonate, solid oxide and direct methanol fuel cells. Studies the technical aspects of fuel cells with respect to thermodynamics, transport phenomena and electrochemistry. Prerequisites: MCE 341 and MCE 344.

**MCE 464 Introduction to Robotics (3-0-3).** Gives an overview of robotics, robot coordinate systems, and direct and inverse kinematics. Introduces manipulator dynamics and force control and compliance. Includes robot sensors and control strategies, and requirement of digital control of robots. Prerequisite: MCE 328 or ELE 353.

**MCE 466 Introduction to Mechatronics (2-3-3).** Introduces the application of microprocessors and digital electronics to the design and application of control systems embedded in smart products. Covers sensors, actuators, software, system hardware and interfacing for mechanical engineering applications, as well as smart product design. Prerequisites: MCE 311 and MCE 328, or ELE 332L and ELE 353. Lab/Tech fee rate B applies.

**MCE 473 Applied Finite Element Analysis (2-3-3).** Introduces Finite Element Method (FEM) and its application in different mechanical engineering problems. Includes theoretical and computational basics of finite element method, element formulation and assembly of global matrices. Uses commercial software to solve various engineering problems. Applications include solid mechanics, 2-D steady state heat conduction and fluid problems. Prerequisite: MCE 321; prerequisites/concurrent: MCE 328 and MCE 344. Lab/Tech fee rate B applies.

**MCE 477 Composite Materials (3-0-3).** Examines advanced composite materials and applications. Covers stress-strain relationship for an orthotropic lamina, laminate analysis, static strength of laminates, analysis of laminated beams, introduction to micro-mechanical analysis of laminae, design applications and computer program applications. Prerequisites: MCE 230, MCE 321 and MTH 221.

**MCE 482 Intermediate Fluid Mechanics (3-0-3).** Covers potential flow, stream function, velocity potential, plane flow past closed-body shapes, airfoil theory; fluid dynamic forces on immersed bodies, drag and lift, flow over cylinder, sphere and flat plate; fundamentals of compressible fluid flow, isentropic flow, shock waves and supersonic nozzles and friction and heat interaction; types of pumps and turbines, pumps and turbine scaling laws. Introduces the use of commercial computational fluid dynamics (CFD) software. Prerequisites/concurrent: MCE 325, MCE 345L and MTH 203.

**MCE 485 Hydraulics of Pipeline Systems (3-0-3).** Covers fundamentals of piping systems, hydraulic and mechanical design considerations, pipe sizing and selection, constant and telescopic wall thickness, pipe network design, pipeline economics, transient pipe flow, pumps performance, affinity laws, cavitations and net positive suction head. Introduces drag reduction techniques, thermal hydraulics and natural gas transmission. Prerequisite: MCE 344.

**MCE 487 Turbomachines (3-0-3).** Explores classification of turbomachines, dimensional analysis and model testing; basic equations of fluid mechanics and Euler's theory; incompressible flow turbomachines (centrifugal and axial flow pumps), system matching, performance characteristics and cavitation; hydraulic turbines; compressible flow turbomachines (centrifugal and axial flow compressors), reaction ratio, stage loading, stage efficiency, surge and choking limits; and axial flow gas turbines. Prerequisites: MCE 240 and MCE 341.

**MCE 488 Introduction to Computational Fluid Dynamics (CFD) (2-3-3).** Explores discretization techniques and solution algorithms; finite difference solutions to classical model equations pertinent to wave phenomena, diffusion phenomena, or equilibrium, boundary and initial conditions and stability considerations, application into equations of fluid mechanics and heat transfer, using software packages in solving CFD problems. Prerequisite: MCE 325; prerequisite/concurrent: MCE 344. Lab/Tech fee rate B applies.

**MCE 490 Design Project I (1-0-1).** Addresses the role of design methodology in mechanical engineering through an open-ended, in-depth design project. Includes the design, manufacturing and testing of a complete system using relevant professional standards. Covers concept generation techniques and design for manufacturability, reliability and sustainability. Considers alternative design evaluation and selection techniques, collaborative design and product dissection. Focuses on the economic impact of design decision. Emphasizes the role of intellectual property, ethical issues, and verbal and written communication skills in mechanical engineering. Prerequisites: MCE 311, ENG 207 and senior standing; prerequisites/concurrent: MCE 322 and MCE 345L.

**MCE 491 Design Project II (0-6-2).** Continues the work of MCE 490. Prerequisite: MCE 490.

## NGN Engineering

**NGN 110 Introduction to Engineering and Computing (1-2-2).** Examines common concepts in the engineering and computer science disciplines at AUS. Introduces word processing and spreadsheet software, team concepts, the roles and responsibilities of engineers and computer scientists, problem solving, principles of the design process, written and oral communication, professional ethics and sketching. Includes selected

laboratories in different disciplines. Requires a design project meeting desired objectives in a team environment. Prerequisite: admission to the College of Engineering.

**NGN 111 Introduction to Statistical Analysis (2-1-2).** Covers descriptive statistics, graphical and numerical representation of information, measures of location and variation, elementary probability theory, and discrete and continuous probability models. Introduces statistical inference (estimation and hypothesis testing). Includes simple regression and correlation, designing experiments and use of statistical software. Presents examples from the engineering and related disciplines. Not open to industrial engineering students. Not open to students who have completed QBA 201 or STA 201 or STA 202. Prerequisite/concurrent: MTH 103.

**NGN 497 Professional Experience in Engineering (3-0-3).** Requires a minimum of 10 continuous weeks of approved professional experience related to the student's major. Students are placed in industry, working full-time under the supervision of an academic coordinator and an industry mentor. Restricted to College of Engineering students. Prerequisites: Junior II standing and approval of internship coordinator for student's major.

## TRS Transportation Systems

**TRS 260 Introduction to Transportation Systems (3-0-3).** Introduces transportation system components including modes, movements and flow; processes including planning, design, operation, maintenance and service quality; and issues of viability such as mobility/accessibility, equity, environmental factors, user behavior and safety. Focuses on the inter-connectedness of components, processes and issues of viability. Not open to civil engineering students. Prerequisites: MTH 102 or MTH 103 or MTH 111, STA 201 or STA 202 or QBA 201, and WRI 102.

**TRS 360 Transportation Systems Management (3-0-3).** Introduces fundamentals of managing components/processes/impacts of transportation systems: travel demand and travel time impacts and management, environmental impacts (air quality, noise, water) and management, safety systems management, public health impacts and management, transport transportation system operations and control, transportation asset management, pavement management systems. Covers applicable metrics, performance measures and evaluation methods with a focus on sustainability. Prerequisite: CVE 263.

**TRS 361 Public Transportation Systems (3-0-3).** Focuses on transit systems planning methods in urban areas. Covers analysis, evaluation and selection of transit modes with focus on the twin themes of sustainability and innovation. Examines operational issues regarding lines, stops, networks, stations, vehicles, transit units and fleet size. Prerequisite: CVE 263.

## Independent Study

Independent study is the umbrella term used to label two types of independent work: independent course and directed study.

Students are allowed to take one independent study. A second independent study could be approved by the student's associate dean for graduation purposes only.

**Independent Course (1 to 4 credit hours).** An existing course offered in an independent study format. The course is coded using the course number in the catalog. Approved special topic courses can be offered in an independent course format.

Students are not allowed to repeat courses in an independent course format.

To be eligible to apply for an independent course, students must be in good standing.

**Directed Study (1 to 4 credit hours).** An investigation under faculty supervision beyond the scope of existing courses. Prerequisites: minimum CGPA of 3.00, Junior II standing and consent of the instructor.

Directed study courses are numbered as 396 or 496 courses. The three-letter course prefix reflects the field of study of the course (e.g., directed study courses in chemical engineering are coded as CHE 396 or CHE 496).

For more details on independent study, please refer to Registration in Independent Study Courses in the Academic Policies and Regulations section of this catalog.

## Interdisciplinary Study Courses

Interdisciplinary study (IDS) courses provide opportunities for students to benefit from collaboration by faculty from a range of disciplines. Courses with an IDS course code are normally co-taught by two or more faculty members and focus on topics beyond those offered in existing courses. Prerequisites: topic specific. Lab/Tech fee may apply.

IDS courses at the 300 level require sophomore standing or above; 400-level IDS courses are restricted to junior standing and above.

Descriptions of particular IDS courses are made available during registration.

## Special Topic Courses

**Special Topic (1 to 4 credit hours).** Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit. Prerequisites: topic specific. Lab/Tech fee may apply.

Special topic courses are numbered as 194, 294, 394 or 494 courses. The three-letter course prefix reflects the field of study of the course.

Special topic courses at the 300 level require sophomore standing or above; 400-level special topic courses are restricted to junior standing and above.

Descriptions of particular special topic courses are made available in the college during registration.

# School of Business Administration

## ACC Accounting

**ACC 201 Fundamentals of Financial Accounting (3-0-3).** Introduces the principles and concepts underlying financial statements. Includes an introduction to the accounting profession, control, concepts, business entities and all elements of basic financial statements. Prerequisite: any AUS math placement test or SAT Subject Test–Math level 1 or level 2 with a minimum score of 600, or any preparatory math course.

**ACC 202 Fundamentals of Managerial Accounting (3-0-3).** Introduces the principles and concepts underlying managerial accounting. Course includes an introduction to management accounting information and cost accounting. Prerequisite: ACC 201.

**ACC 301 Intermediate Financial Accounting I (3-0-3).** Begins a two-course sequence providing an in-depth study of principles and elements associated with financial statements. Includes financial statement analysis, income measurement, valuation of assets and equities, and generally accepted accounting principles. Prerequisite: ACC 202.

**ACC 302 Intermediate Financial Accounting II (3-0-3).** Continuation of Intermediate Financial Accounting I; focuses on accounting for long-term liabilities, stockholder's equity, cash flow analysis and international financial statements. Prerequisite: ACC 301.

**ACC 303 Cost Accounting (3-0-3).** Covers the uses of accounting data for planning control and decision-making. Topics include budgets and cost concepts, techniques and behavior. Prerequisite: ACC 202.

**ACC 305 Income Tax I (3-0-3).** Introduces the US federal income tax system as it applies to personal income taxes and examines the legislative, judicial and regulatory bases of the code, as well as exposure to the tax accounting concepts of income, examinations, exclusions, losses, expenses, credits, property transactions and AMT as they apply to theory and practice. Prerequisite: ACC 301.

**ACC 306 Income Tax II (3-0-3).** Introduces the US federal income tax system as it applies to corporations, partnerships, estates and trusts. Includes a comparison and contrast of personal and corporate taxation, as well as an examination of corporate organization and capital structure, distributions and reorganizations and accumulated earnings rules. Prerequisite: ACC 301.

**ACC 360 Accounting Information Systems (3-0-3).** Provides an overview of current accounting information systems concepts, web technology, online auditing issues and contemporary accounting issues. Includes the following topics: e-business, computer hardware and software issues, accounting cycles, systems development, computer crime, auditing and expert systems. Prerequisites: ACC 202 and junior standing.

**ACC 401 Advanced Financial Accounting (3-0-3).** Covers theory and practices of accounting for partnerships, business combinations and consolidated financial statements, and advanced topics in financial accounting. Prerequisite: ACC 302.

**ACC 410 Auditing (3-0-3).** Studies auditing theory, generally accepted auditing standards, audit procedures, audit reports and the responsibilities and ethics of the auditing profession. Includes the following topics: risk, evidence, internal controls, sampling, audit testing, subsequent events, professional liability, reporting statutory provisions, compilation and review services, and reporting under government auditing standards. Prerequisite: ACC 301.

**ACC 413 Introduction to Accounting for Government and Non-Profit Entities (3-0-3).** Introduces accounting practices and fund management planning, financial control, and the usefulness of accounting data for evaluating program inputs and outcomes. Prerequisite: ACC 301.

**ACC 420 International Accounting Standards (3-0-3).** Introduces comparative global business; international accounting systems; harmonization of accounting standards; international financial reporting and disclosure issues; international financial statement analysis; and international auditing, tax, and management accounting issues. Prerequisite: ACC 301.

## BIS Business Information Systems

**BIS 101 Business Information Systems (3-0-3).** Provides technical proficiency and expertise in office tools as well as important computer skills. Presents analytical techniques and essential knowledge to enhance productivity in higher-level courses. Enhances the ability to apply advanced features of spreadsheet software to business case assignments. Not open to computer science and computer engineering students. Lab/Tech fee rate A applies.

## BLW Business Legal Issues

**BLW 301 Business Law (3-0-3).** Examines business legal issues such as legal concepts, philosophy and functions of court systems. Surveys contracts, sales, agents, legal forms of business and the regulation of businesses. Focuses on US law but also considers international and global legal perspectives. Prerequisites: ACC 201 and ECO 202; prerequisite/concurrent: ENG 204 or ENG 208.

## BUS Business

**BUS 100 Introduction to Business (3-0-3).** Introduces the basic principles of business, including the economic setting in which business operates, types of business ownership and business structure. Explains the role of management, marketing, finance and accounting, as well as the distribution of goods and services. Explores the evolution of business enterprise. Not open to design management majors.

**BUS 300 International Study Tour (3-0-3).** Provides a firsthand opportunity to learn by experiencing the world of international business. Includes a visit to the headquarters of multinational organizations and seminars given by the professionals from these corporations. Prerequisites: academic standing; and junior standing, or sophomore standing with permission of instructor.

**BUS 397 Business Internship (0-0-0).** Requires a minimum of five weeks (200 hours) of on-the-job experience with an approved organization. Mandates documenting

the work undertaken in a formal report as required by the School of Business Administration. Graded as Pass/Fail. Prerequisites: ENG 208, Junior II standing and permission of internship manager. Registration fees applies.

**BUS 497 Business Practicum (3-0-3).** Provides opportunities for application of theory to actual problems in real-life business settings. Enhances research, writing, technical, presentation and soft skills through practical experience. Reinforces objective-setting and performance measurement through a structured reporting process. Requires a minimum of 12 weeks (480 hours) of on-the job experience with an approved organization. Graded as Pass/Fail. Repeatable up to 6 credit hours. Prerequisites: ENG 208, Junior II standing and permission of internship manager.

## ECO Economics

**ECO 201 Principles of Microeconomics (3-0-3).** Introduces the basic principles of microeconomics and their applications: supply and demand, operation of markets, consumer and enterprise behavior, competition and monopoly, income distribution and international trade. Prerequisite: ELPT score of 1 or EPT score of 4 or WRI 001, or placement into WRI 101.

**ECO 202 Principles of Macroeconomics (3-0-3).** Introduces the basic principles of macroeconomics, stressing national income, unemployment, inflation, economic growth, business cycles and open economies. Prerequisite: ELPT score of 1 or EPT score of 4 or WRI 001, or placement into WRI 101.

**ECO 301 Intermediate Microeconomics (3-0-3).** Studies consumer and firm optimization. Emphasizes applications to different market structures, in addition to uncertainty and asymmetric information. Prerequisites: ECO 201, ECO 202, MTH 102 or MTH 103 or MTH 111, and WRI 102.

**ECO 302 Intermediate Macroeconomics (3-0-3).** Examines macroeconomic theory and its application to factors that determine the level of income, employment, output and prices in an economic system. Emphasizes stabilization policies and empirical applications. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 305 International Trade (3-0-3).** Introduces the economics of international trade, including why countries trade, commercial trade policies and their effects, growth and international trade, and multinational firms. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 306 International Monetary Economics (3-0-3).** Starts with basics of international capital flows, exchange rate determination and the analysis of the international monetary system. Uses theory to analyze contemporary issues such as globalization and liberalization of capital flows. Addresses the stability of foreign exchange markets with reference to currency crises in emerging markets. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 310 Development Economics (3-0-3).** Studies the economic transformation of developing countries. Examines both standard models of economic growth and micro-level foundations of economic development; among the latter are the role of institutional arrangements, the absence of fully functioning markets and the functional role of income distribution. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 312 Economics of Labor (3-0-3).** Covers the economic analysis of employment and wages. Examines unemployment, migration, human capital accumulation, incentive pay, income inequality and discrimination. Assesses the labor market effects of unions, regulation, the business cycle and long-term growth. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 315 Economics of the Middle East (3-0-3).** Covers economic growth and social outcomes of the contemporary Middle East. Focuses on development and production patterns, human capital and labor market conditions, migration and trade. Examines regional similarities and differences, and the roles of oil and the state. Addresses the interaction of resources, institutions and economic change. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 320 History of Economic Thought (3-0-3).** Analyzes the development of economic theory. Uses specific historical contexts and also explores the major figures and schools in economic thought. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 323 Health Economics (3-0-3).** Applies economic concepts to health and health care questions. Studies how health markets and systems function. Examines the demand for and production of health services, health insurance, asymmetric information between patients and medical providers, and the pharmaceutical market. Assesses the role of government regulations and public health policies. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 325 Public Economics (3-0-3).** Examines the microeconomic theory as a framework for understanding the problems of public managers. Considers resource scarcity, consumer behavior, production costs, economics of efficient management, operation of product markets under competition and monopoly, labor markets, market failure and public goods. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 327 Industrial Organization (3-0-3).** Studies the theory and the empirical evidence concerning the organization of firms and industries. Focuses on industry structure, on conduct and performance, and on more recent advances based on microeconomic theory, including transactions cost economics, game theory, strategic behavior and information theory. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 330 Money and Banking (3-0-3).** Examines the role of money and credit in the economy. Includes the following topics: the structure and operations of commercial banks, central banking and the operation of monetary policy, non-banking institutions and the structure of financial markets, and elements of monetary theory. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 333 Islamic Economics (3-0-3).** Introduces the positive and normative principles of Islamic economics from a historical and history of thought perspective. Examines the role of the state in economic activity, comparing the Islamic economic system with contemporary systems such as capitalism and Marxism. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 340 Real Estate Economics (3-0-3).** Examines the spatial pattern of economic activities and commercial and residential real estate in urban areas. Analyzes the markets for real estate and related public policies using urban economic theories and financial economic tools. Considers how demand for space varies by location characteristics, such as transportation costs, schooling, crime and pollution. Explains the concepts of real estate investments and the supply of residential and commercial real estate by emphasizing the durability and reusability of real estate properties. Prerequisites: ECO 201 and ECO 202.

**ECO 341 Behavioral Economics (3-0-3).** Applies insights from psychology to the study of economic problems and decisions. Addresses why

people behave in ways that are inconsistent with the predictions of traditional models of rationality and self-interest. Discusses public policy in the presence of behavioral biases and beliefs, as well as findings from laboratory and field experiments. Covers choice under perceived risk, limit to self-control, myopia, time inconsistency, information suppression, peer effect and behavioral strategic interactions. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 351 Introduction to Econometrics (3-0-3).** Covers inferential statistics and regression estimation and analysis, including detection and treatment for violations of the classical assumptions, omitted variable bias, dummy variables and binary dependent variables. Emphasizes model-building techniques and interpretation of results. Involves the use of specialized software. Prerequisites: ECO 201, ECO 202, WRI 102 and any one of QBA 201, NGN 111, STA 201 or STA 202. Lab/Tech fee rate A applies.

**ECO 401 Managerial Economics (3-0-3).** Managerial decision making is considered from the perspective of the economic theory of the firm. Integrates the traditional topics in the theory of the firm, production, cost and price with finance and internationalization of firms, product markets, financial markets and production. Prerequisites: ECO 201, ECO 202 and QBA 201.

**ECO 404 Economics of Environmental and Natural Resources (3-0-3).** Covers the economic issues that arise in the use of environmental resources. Addresses the contention that markets fail to adequately manage environmental problems and evaluates alternative pollution-control mechanisms. Focuses on topics such as water and air quality, natural resource management, renewable and non-renewable energy, global climate change, fisheries, biodiversity and environmental conservation. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 410 Urban and Regional Economics (3-0-3).** Analyzes the economics of the location and growth of urban and regional areas with emphasis on public policy issues. Includes discussion of land-use patterns, measurements and change in regional economic activity, and urban problems such as transportation, housing, poverty and crime. Prerequisites: ECO 201, ECO 202 and WRI 102.

**ECO 451 Advanced Econometrics (3-0-3).** Addresses topics in cross section and panel data estimation, with emphasis on assessment of internal validity and limits to causal inference. Covers non-classical estimation methods: instrumental variables, multinomial models, truncation and censoring, selectivity, simultaneous equations, dynamic effects, and fixed and random effects panel models. Prerequisite: ECO 351.

**ECO 452 Economic Forecasting (3-0-3).** Covers the basics of forecasting and time series analysis in economics, finance and business. Discusses deterministic and stochastic properties of time series. Focuses on the construction of estimates, and tests univariate and multivariate forecasting models. Considers the evaluation of forecasts in terms of unbiasedness, efficiency and predictive information content. Prerequisites: ECO 201 and ECO 202, and QBA 201 or STA 201 or STA 202 or NGN 111.

**ECO 490 Senior Project in Economics (3-0-3).** Provides the opportunity to apply economic methodology and tools to an independent, student-defined research project. Prerequisites: ECO 301, ECO 302, ECO 351 and Junior II standing.

## FIN Finance

**FIN 201 Fundamentals of Financial Management (3-0-3).** Introduces business finance, including global aspects; acquisition and use of short-term funds and long-term capital; overview of money and capital markets; management of assets, liabilities and capital accounts; financial analysis and time value of money; valuation of corporate securities; long-range capital budgeting; leasing; and cost of capital. Prerequisites: ACC 201, MTH 102 or MTH 103 or MTH 111, and QBA 201 or NGN 111 or STA 201 or STA 202.

**FIN 304 Real Estate Investing (3-0-3).** Covers terminology, legislation, principles and analytical techniques pertaining to financing of real estate. Includes the perspective of lender, residential borrower and income property borrowers. Addresses real estate dynamics and role in the economy. Prerequisites: ACC 202, FIN 201 and WRI 102.

**FIN 306 Wealth Management for Individuals (3-0-3).** Introduces insurance and risk management and personal financial planning with specific applications to property, disability, health and life insurance. Also covers aspects of financial planning including mutual funds, retirement planning, offshore banking and investment objectives. Prerequisites: ACC 202, FIN 201 and WRI 102.

**FIN 310 Analysis of Financial Statements (3-0-3).** Provides the skills needed to read, analyze and interpret the information contained in a company's financial statements. Integrates accounting and financial principles and discusses the ethics of both professions. Prerequisites: ACC 202 and FIN 201.

**FIN 320 Banking (3-0-3).** Provides an overview of the banking industry with an emphasis on commercial bank management. Specific topics include the duration and term structure of interest rates, asset/liability management, and risk and credit management. Prerequisites: FIN 201 and WRI 102.

**FIN 330 Investments (3-0-3).** Covers investment objectives, mechanics of buying and selling financial assets, and portfolio management. Focuses on risk versus return in investment theory, as well as on constructing and managing real-time hypothetical investment portfolios. Prerequisites: ACC 202, FIN 201 and WRI 102.

**FIN 340 Financial Crime (3-0-3).** Examines the scale and causes of crime in financial systems. Covers statement fraud, insider trading, bribery and corruption, money laundering and internal control weaknesses. Addresses preventive and counter-fraud policy. Prerequisite: FIN 310.

**FIN 350 Mergers and Acquisitions (3-0-3).** Covers mergers and acquisitions along several dimensions: motivations of mergers, valuation of targets, estimating synergies, and other financial, strategic and legal aspects of mergers. Examines hostile mergers and international cross border transactions. Prerequisite: FIN 201.

**FIN 360 Behavioral Finance (3-0-3).** Studies the impact of psychology and human emotions on investment and financial decision-making processes. Examines the validity of the traditional assumptions of market efficiency and individual rationality so pervasive in the finance literature. Prerequisite/concurrent: FIN 330.

**FIN 370 Fundamentals of Islamic Finance (3-0-3).** Studies the origin and contemporary development of Islamic banking and finance. Examines case studies of the experience of Islamic finance in several countries. Explores current and future challenges to Islamic finance in an integrated world economy. Prerequisite: ECO 202 or FIN 201.

**FIN 375 Trading and Financial Markets (3-0-3).** Relies on market trading and computer intensive industry

tools to integrate theory into practice. Covers a broad base of financial assets including equities, derivatives (options and futures contracts) and fixed income instruments. Centers around computerized simulations, interactive discussions, Excel programming, decision-making under pressure and research-based assignments. Focuses on the comprehensive application of acquired financial knowledge in a stimulating, fast-paced, real-world setting. Prerequisite: FIN 330.

**FIN 389 Advanced Financial Modeling (3-0-3).** Addresses computer skills in finance to support decision making by financial managers. Emphasizes software applications in the areas of time-value of money, capital budgeting, cost of capital, valuation and rates of return, risk, portfolio diversification and option hedging. Prerequisite: FIN 330.

**FIN 401 International Finance (3-0-3).** Covers financing of international trade and investment, foreign exchange markets and exchange rate determination, and balance of payments. Focuses on international financial management within the firm. Prerequisite: FIN 330; prerequisite/concurrent: FIN 320.

**FIN 402 Futures and Options (3-0-3).** Covers conceptual and practical aspects of the functioning of speculative markets for various derivatives. Examines futures, options, swaps, and other products. Prerequisite: FIN 330; prerequisite/concurrent: FIN 320.

**FIN 404 Portfolio Management (3-0-3).** Provides the theoretical and operative framework for portfolio and advanced investment management. Requires the application of portfolio models and concepts to live market data to perform analytical skills and evaluate equities, fixed income securities and other investments. Covers asset pricing, diversification and other financial models in detail. Prerequisite: FIN 330.

**FIN 406 Investment Banking (3-0-3).** Covers the role of investment banks, the functions performed by investment banking professionals, and the strategic issues confronting the industry. Prerequisites: FIN 320, FIN 330 and junior standing.

**FIN 407 Alternative Investments (3-0-3).** Examines the risk and return characteristics of alternative assets such as hedge funds, commodities, private equity and credit derivatives from a stand-alone perspective as well as within a portfolio context. Evaluates venture capital, leveraged buyouts and distressed debt as common forms of private equity. Prerequisite: FIN 330.

**FIN 430 Financial Forecasting (3-0-3).** Illustrates how to use statistical models and technical analysis to forecast future movements of financial variables such as stock prices, exchange rates and interest rates. Prerequisite: FIN 201.

**FIN 440 Asset Valuation (3-0-3).** Covers concepts and techniques for analyzing financial decisions and asset valuation. Focuses on valuation techniques for various asset classes, forecasting and estimation of free cash flow, estimating the cost of capital and real options. Addresses valuation as applied to single and multiple projects, individual businesses, subsidiaries and diversified companies. Considers discounted cash flows models, free cash flow to equity models and relative valuation. Prerequisite: FIN 330.

**FIN 450 Case Studies in Corporate Finance (3-0-3).** Emphasizes the case study approach to intermediate financial management (corporate finance). Includes the following topics: capital budgeting, corporate governance, mergers, capital structure, dividend policy and short-term financial management. Prerequisites: FIN 310, FIN 320 and FIN 330.

## IEN Innovation and Entrepreneurship

**IEN 301 Innovation and Entrepreneurship Mindset (3-0-3).** Covers the design thinking process and entrepreneurship practices. Involves empathetic understanding of users, problem reframing, idea generation, prototyping, experimentation, lean-startup methods, go-to-market strategies, and pitching and presenting as an entrepreneur. Develops an innovation and entrepreneurship mindset imbued with sustainability and leadership principles to empower collaborative interdisciplinary teams. Prerequisite: sophomore II standing.

## MGT Management

**MGT 201 Fundamentals of Management (3-0-3).** Surveys the basic concepts and ideas of organizational behavior and the various functions and activities of the manager through global perspective. Includes the following topics: plans, goals, decision making, change, motivation, human resources, ethics and social responsibility, groups and teams, organization design, leadership and control. Prerequisite/concurrent: WRI 102.

**MGT 300 Management of Public Organizations (3-0-3).** (Formerly PBA 300). Introduces the challenges and problems of management in public organizations, including the need for effective leadership, appropriate motivational techniques and various communication styles. Positions the public agency in an environment of competing interests, politics, power relations and disjointed policy processes. Explores current trends in balancing the need for efficiency with a desire to be responsive to the needs of the public. Considers alternative perspectives on the role of public administrators. Prerequisite: MGT 201 or UPL 201; prerequisite/concurrent: ENG 203 or ENG 204.

**MGT 301 Organizational Behavior (3-0-3).** Focuses on human behavior in organizations by using current management theory and research to examine the factors that influence individual and group performance. Covers perception, personality, attitudes, values, motivation, decision making, leadership, power and politics, conflict and negotiation, groups and culture. Prerequisite: MGT 201; prerequisite/concurrent: ENG 203 or ENG 204.

**MGT 302 Managing Human Resources (3-0-3).** Examines the foundations, functions and activities involved in the managing of human resources, striking a balance between current theory and practice. Includes the following topics: personnel planning, recruitment and selection, policy and procedures, performance appraisal, compensation and benefits, training, safety and industrial relations. Prerequisites: MGT 201 and ENG 204.

**MGT 303 Management and Leadership Development (3-0-3).** Focuses on the necessary skills and abilities of the successful leader and manager. Introduces success factors and addresses the assessment and development of managerial and leadership skills throughout the course. Prerequisites: MGT 201 and ENG 204.

**MGT 304 Performance Management (3-0-3).** Presents performance management as an ongoing process that attempts to match employee contributions with organizational goals and strategies. Provides a theoretical and practical understanding of performance management issues. Addresses factors that have an impact on performance and the actions that can improve it. Analyses organizational, group and individual-level performance in complex contemporary organizations. Examines the specific challenges of performance management in private and public organizations. Prerequisite: MGT 302.

**MGT 305 International Business (3-0-3).** Examines the nature and scope of international trade and investment, international institutions, the international monetary system and exchange markets and some of the major issues involved in the functional aspects of international business and management. Prerequisites: MGT 201, and ENG 203 or ENG 204.

**MGT 306 Cross-Cultural Management (3-0-3).** Introduces culture as an important variable in international management and examines its impact on organizations, strategy, negotiations, management of human capital, leadership, team building and ethics. Applies a metaphor approach to explore key differences among cultures and examine their relevance for international management practice. Prerequisite: MGT 301.

**MGT 310 Fundamentals of Family Business (3-0-3).** Introduces the unique challenges faced by family businesses and the potential solutions to these issues. Examines the characteristics that define family businesses and the potential risks and benefits these bring to family businesses in the UAE. Discusses issues such as family dynamics, generational gaps, leadership, the role of non-family members, governance and succession planning. Prerequisite: MGT 201; prerequisite/concurrent: ENG 204.

**MGT 313 Managing Change and Innovation (3-0-3).** Explores the importance of innovation to business success and considers current trends in technology, society, consumer expectations and the workforce. Examines strategies for enabling innovation and overcoming obstacles to change. Presents the concept of a learning organization in the context of transformational leadership. Prerequisite: MGT 201.

**MGT 314 Management Intervention and Consultation (3-0-3).** Introduces the management consulting industry and explores key activities associated with the consulting process. Considers the consultant as an advisor and change agent. Examines topics such as problem analysis, proposal development, project initiation, management of expectations, reputation and expertise, and knowledge transfer. Prerequisite: MGT 201.

**MGT 315 Enterprise Resource Planning (3-0-3).** Introduces Enterprise Resource Planning (ERP) and the deployment and usage of ERP software. Examines the deployment and usage of ERP software and considers how ERP software links operations, marketing, finance, accounting, human resources and information technology into a cohesive framework. Not open to students who have completed INE 460. Prerequisites: MGT 201, ACC 201 and MIS 201, or CHE 332 or EGM 361 or EGM 364 or INE 332. Registration fee applies.

**MGT 316 Career Management (3-0-3).** Provides a structured approach to making career choices and decisions and explores personal development opportunities to identify strengths, professional interests and values as a basis for career planning and management. Prerequisites: MGT 201, and ENG 203 or ENG 204.

**MGT 317 Management for Sustainability (3-0-3).** Examines the management of a company's financial, social and environmental risks, obligations and opportunities. Examines both the foundations of environmental protection as well as current management theory and research pertaining to social issues of sustainable management. Prerequisites: MGT 201, and ENG 203 or ENG 204.

**MGT 321 Women in Leadership (3-0-3).** Introduces the skills and development necessary for female leaders to succeed in the today's environment. Examines the factors for leadership success in a multicultural, global environment and challenges students to assess and develop their own leadership potential. Provides a clear framework for identifying issues germane to female leadership in the 21st century. Prerequisites: MGT 201, and ENG 203 or ENG 204.

**MGT 360 Business Ethics and Social Responsibility (3-0-3).** Introduces the ethical dimensions of business as they relate to the various stakeholders inside and outside the organization. Includes topics such as business ethical theory, ethical decision making, typical dilemmas and corporate social responsibility. Prerequisite: MGT 201; prerequisite/concurrent: ENG 203 or ENG 204.

**MGT 364 Introduction to Corporate Governance (3-0-3).** Introduces concepts for the top-level control of professional managers, especially by the board of directors, in modem corporations and other organizations. Examines the results of both good and bad governance. Covers topics such as the separation of ownership from control; agency, stakeholder and stewardship theories of governance; and their application to large and small businesses and non-profit organizations. Prerequisites: BLW 301 and MGT 360.

**MGT 380 Project Management (3-0-3).** Examines the concepts and techniques of managing projects in service and manufacturing settings. Includes the following topics: project selection and evaluation, dynamics, motivation and evaluation of team members, scheduling, budgeting and closure. Prerequisites: ACC 202, FIN 201, MIS 201, ENG 204 and MGT 301 or MIS 303 or COE 420.

**MGT 403 Entrepreneurship (3-0-3).** Focuses on the creation of new ventures: the people, the process and the dynamics. Includes topics such as identifying and evaluating opportunities, success and failure factors, attitudes and characteristics of entrepreneurs, stand-alone and internal corporate ventures, and local and global issues in entrepreneurship. Requires the development of a viable business plan in the course. Prerequisites: ENG 204; and all of FIN 201, MGT 201 and MKT 201, or both EGM 361 and EGM 364, or both EGM 361 and CHE 332, or all of EGM 364, INE 311 and INE 332.

**MGT 406 Business Policy and Strategy (3-0-3).** Applies the functional knowledge acquired in previous coursework to the analysis of strategic-level business problems and decisions. Uses business cases extensively to highlight the diversity and complexity of organizational environments and systems. Includes the following topics: missions and objectives; environmental analysis; formulating, implementing and assessing strategies and policies; and international, social and ethical issues. Prerequisites: business senior standing; FIN 201, MGT 201, MIS 201, MKT 201 and ENG 204.

## MIS Management Information Systems

**MIS 201 Fundamentals of Management Information Systems (3-0-3).** Covers information as an organizational resource. Focuses primarily on the organizational foundation of management information systems by establishing a link between business processes and information technology. Includes the following topics: decision-making frameworks, transaction processing systems, decision support systems, inter-organizational information systems, office automation, strategic information systems, enterprise systems, systems development, networks and IT infrastructure, social impacts of IT and more. Provides a technology update in hardware and software basics, database management and telecommunications. Prerequisite/concurrent: WRI 102.

**MIS 300 Data Communications and Networking (3-0-3).** Provides a basic

understanding of the technical and management aspects of business data communications and networking. Includes the following topics: telecommunications services, technology and policy; standards organizations that contribute to global telecommunications technology specification; signaling and switching; physical transmission media; wireless transmission services; network access and transmission methods; data network topologies and network access methods (e.g., Ethernet and ATM); network transmission methods (e.g., T-carriers, DSL and ISDN); data network connectivity; and networking in open source environments. Prerequisites: MIS 201 and WRI 102.

**MIS 301 Fundamentals of Database Management (3-0-3).** Covers information as an organizational resource. Addresses the beginning technical, business and application development issues associated with managing and using an organization's data resources. Employing SQL as the database language, the course covers organizational data management, data analysis and modeling with the entity relationship model, database design with SQL, normalization and the relational model. Prerequisites: MIS 201 and WRI 102.

**MIS 303 Introduction to Systems Analysis and Design (3-0-3).** Examines traditional analysis, logical design through a data flow analysis and the system development life cycle approach. Covers methods for structured analysis and design. Addresses data structures, definitions and normalization. Focuses on the use of various tools associated with systems analysis. Prerequisite: MIS 301 or CMP 320.

**MIS 305 E-Commerce (3-0-3).** (Formerly MIS 404). (Equivalent to MKT 303). Examines how the Internet and the World Wide Web are used for marketing and business purposes. Covers well-established companies based in the United Arab Emirates that have established a marketing presence on the Internet. Projects include building a website to market a specific product and establishing a simulated business on the Internet. Prerequisites: MIS 201 and MKT 201.

**MIS 321 Object-Oriented Programming for Business Applications (3-0-3).** Introduces programming concepts such as variables, control structures and arrays, as well as object-oriented programming concepts such as methods, classes, objects and inheritance. Applies these concepts to solve business problems by designing graphical user interfaces in applications, applets and mobile apps. Prerequisite: MIS 201.

**MIS 380 Fintech: Introduction to Financial Technology (3-0-3).** Covers the history of innovation in the financial services sector and how technological progress shapes financial products. Focuses on the role of digital financial technology (fintech) in transforming business models and solutions in finance. Discusses the challenges associated with adopting and regulating fintech business. Prerequisites: FIN 201, MGT 201, MIS 201 and ENG 204.

**MIS 388 Business Analytics (3-0-3).** Covers business analytics concepts, methods, tools and applications. Examines how businesses utilize analytic model to analyze large datasets and make informed business decisions. Prerequisites: MIS 201, and QBA 201 or NGN 111 or STA 201 or STA 202.

**MIS 402 Technology and Knowledge Management (3-0-3).** Explores the theoretical foundation of technology and knowledge management and its value to the organization. Examines the nature of technological change, innovation and intellectual capital, and the valuation of an organization's knowledge assets. Prerequisites: MIS 201 and MGT 360.

**MIS 405 Information Systems Strategy (3-0-3).** This is the capstone course in MIS. Discusses strategic IS issues, including planning IT infrastructures and architectures, business process reengineering, supply chain management, enterprise computing and systems integration. Covers emerging issues such as e-government and cyber ethics. Prerequisites: MIS 303 or COE 420, and senior standing.

## MKT Marketing

**MKT 201 Fundamentals of Marketing (3-0-3).** Introduces the societal marketing concept as a guide to develop marketing strategies in business and non-profit organizations within a global context. Focuses on analyzing consumer needs, market segmentation, new product development, pricing, distribution and integrated communication. Examines relationships among consumers, markets and business. Prerequisite: WRI 102.

**MKT 301 Consumer Behavior (3-0-3).** Combines theories from the fields of marketing, psychology, sociology and anthropology, to understand the psychological processes that characterize consumers' consumption experiences. Applies behavioral science theories to develop marketing strategies and persuasive mechanisms involved in perception, attitude and behavioral changes. Prerequisite: MKT 201.

**MKT 302 Marketing Research (3-0-3).** Examines research tools used to help make marketing decisions. Teaches how to define research problems, to select projects and to analyze data. Requires the execution of a consumer survey as a major component of the course. Uses computer statistical packages to analyze surveys. Prerequisites: MKT 201, and QBA 201 or NGN 111 or STA 201 or STA 202.

**MKT 303 E-Commerce (3-0-3).** (Equivalent to MIS 305). Examines how the Internet and the World Wide Web are used for marketing and business purposes. Covers well-established companies based in the United Arab Emirates that have established a marketing presence on the Internet. Projects include building a website to market a specific product and establishing a simulated business on the Internet. Prerequisites: MIS 201 and MKT 201.

**MKT 305 Retail Marketing (3-0-3).** Explores marketing in large and small retail institutions. Includes the following topics: retail strategy, store layout, buying, merchandising, pricing, promotion, inventory management, customer service, control, store image, trading area and location selection. Prerequisite: MKT 201.

**MKT 307 B2B Marketing and Negotiations (3-0-3).** Provides an in-depth understanding of the unique aspects of marketing in a business-to-business environment through the use of lectures, cases, guest speakers and media presentations. Focuses on organizational buying, buyer-seller relationships, market analysis and planning, demand and sales estimation and marketing-mix decisions. Considers a variety of business situations, such as marketing to manufacturers, other commercial organizations, government and institutions. Prerequisites: MKT 201 and ENG 204.

**MKT 309 Global Marketing (3-0-3).** Focuses on the analysis of environmental forces affecting international marketing decisions, selection of global target markets, and the design and development of global marketing plans. Covers issues and challenges inherent in the formulation and implementation of global marketing strategies and tactics. Considers the application of standardization and

adaptation marketing strategies. Prerequisites: MKT 201 and ENG 204.

**MKT 310 Marketing Communications (3-0-3).** Focuses the design and management of integrated marketing communications campaigns to promote products and services. Examines promotional tools such as advertising, public relations, consumer and trade promotions, sponsorships, direct marketing, interactive marketing, digital marketing; and the media for marketing communications campaigns. Explores methods for assessing marketing communications campaign effectiveness. Prerequisites: MKT 201, and ENG 203 or ENG 204.

**MKT 354 The Marketing of Luxury (3-0-3).** Studies the meaning of luxury and the demands and challenges faced by marketers in this sector. Examines business intelligence, environmental trends, branding, communications, e-commerce, sustainability and ethics in luxury through readings and cases for practical application and experiential learning. Introduces leaders of the luxury industry in the Middle East. Illustrates the wide variety of career opportunities available in the luxury industry and related fields. Prerequisites: MKT 201, and ENG 203 or ENG 204.

**MKT 360 Digital Marketing (3-0-3).** Provides a theoretical and practical understanding of digital marketing. Presents marketing concepts for an online world through readings, lectures and the use of interactive online tools. Practically applies the concepts in course projects and real-world analyses of local businesses in order to develop or improve digital marketing for the business. Illustrates the potential for digital entrepreneurship in both existing and new businesses. Prerequisites: MKT 201, and ENG 203 or ENG 204.

**MKT 365 Services Marketing (3-0-3).** Examines service-related issues, practice and strategy in business organizations. Includes the following topics: marketing analysis of service quality, service gaps, consumer expectations, service delivery strategies and customer relationship management. Builds on marketing concepts from other courses and applies them specifically to service industry settings. Prerequisite: MKT 201.

**MKT 370 Brand Management (3-0-3).** Introduces the steps involved in building strong brands and maximizing the value of existing brands. Examines a framework for understanding when and why consumers care about brands, and introduces tools for measuring brand equity. Presents the business process of mission and strategy creation through brand and identity development and execution, and reinforces the concepts through readings, case studies and two course projects for practical applications and experiential learning. Prerequisite: MKT 201.

**MKT 372 Tourism Destination Marketing (3-0-3).** Addresses how local government authorities responsible for tourism develop and market tourism clusters in order to appeal to consumers in high-potential feeder markets. Explores how executives in privately owned destinations and tourism service organizations identify profitable markets and create promotional appeals based on an understanding of shifting social values and lifestyles. Examines the role that consumer thought processes play in evaluating and selecting destinations. Prerequisites: MKT 201 and ENG 204.

**MKT 375 Event Marketing (3-0-3).** Provides an in-depth understanding of the various tools and techniques in event marketing and the roles they play in the firm's communication strategy. Employs foundational event marketing concepts to examine event marketing cases in both public and private contexts. Prerequisites: MKT 201, and ENG 203 or ENG 204.

**MKT 381 Fashion Marketing (3-0-3).** Provides a theoretical and practical understanding of product development, pricing, distribution and communication in the fashion industry. Presents marketing concepts such as segmentation, targeting and positioning in fashion through readings, case studies, videos and a course project for practical application and experiential learning. Introduces leaders of the fashion industry in the Middle East. Examines the wide variety of career opportunities available in the fashion industry and related fields. Prerequisites: MKT 201, and ENG 203 or ENG 204.

**MKT 401 Marketing Strategy (3-0-3).** Analyzes current marketing management issues. Requires the development of a marketing plan for an outside organization, analysis of case studies and participation in computer simulation exercises. Prerequisites: MKT 301 and senior standing.

**MKT 405 Luxury Brand Management (3-0-3).** Provides a theoretical and practical understanding of product development, pricing, accessibility (distribution) and communication when seeking to gain access to consumers in luxury industries. Presents and reinforces new luxury business models grounded in anti-laws of marketing through readings, case studies and a course project for practical application and experiential learning. Introduces leaders of the luxury industry in the Middle East. Illustrates the wide variety of career opportunities available in the luxury industry and related fields. Prerequisites: MKT 301 or MKT 305 or MKT 370, and senior standing.

## QBA Quantitative Business Analysis

**QBA 201 Quantitative Business Analysis (3-0-3).** Covers descriptive and inferential statistics with emphasis on business applications and the use of software. Examines the elements of quantitative decisions and the characteristics of business data. Discusses probability, population and sampling distributions, measures and tests of association, and point and interval estimation. Introduces hypothesis testing and linear models of causal inference. Not open to students who have completed NGN 111 or STA 201 or STA 202. Prerequisite: any AUS math placement test or SAT Subject Test–Math level 1 or level 2 with a minimum score of 600, or any preparatory math course.

## SCM Supply Chain Management

**SCM 202 Operations Management (3-0-3).** Introduces the basic principles, functions and concepts involved in the design, management and control of operations in contemporary organizations. Covers topics such as production planning, quality control and materials management, and stresses tools and techniques required to improve the efficiency, effectiveness and competitiveness of both service- and manufacturing-based organizations. Prerequisite: QBA 201 or NGN 111 or STA 201 or STA 202.

**SCM 310 Management of the Supply Chain (3-0-3).** Demonstrates the strategic importance of the supply chain and emphasizes the overall reach of supply chain management. Synthesizes supply chain management principles to deliver cost-effective customer service through integration of functional areas including marketing, information systems management and purchasing/procurement. Examines supply chain performance metrics, and takes a closer look at identifying and managing suppliers and the role of purchasing. Considers issues such as strategic sourcing, supplier selection and development, collaborative

planning, just-in-time, customer relationship management and enterprise resource planning. Prerequisite: SCM 202.

**SCM 311 Logistics Management (3-0-3).** Covers and applies the basic modeling and solution techniques for planning and executing the decisions in logistics and supply chain management. Uses optimization and simulation techniques to extend the understanding of planning, organizing, operating and controlling the supply chain operations. Brings together the principles of logistics management to deliver cost-effective customer service through the integration of transportation, inventory management and materials handling. Examines inbound (purchasing and materials management) and outbound (demand management and customer service) logistics, inventory management, warehousing, transportation systems and preliminary concepts in logistics network design. Prerequisite: SCM 202.

## Independent Study

Independent study is the umbrella term used to label two types of independent work: independent course and directed study.

Students are allowed to take one independent study. A second independent study could be approved by the student's associate dean for graduation purposes only.

**Independent Course (1 to 4 credit hours).** An existing course offered in an independent study format. The course is coded using the course number in the catalog. Approved special topic courses can be offered in an independent course format.

Students are not allowed to repeat courses in an independent course format.

To be eligible to apply for an independent course, students must be in good standing.

**Directed Study (1 to 4 credit hours).** An investigation under faculty supervision beyond the scope of existing courses. Prerequisites: minimum CGPA of 3.00, Junior II standing and consent of the instructor.

Directed study courses are numbered as 396 or 496 courses. The three-letter course prefix reflects the field of study of the course (e.g., directed study courses in accounting are coded as ACC 396 or ACC 496).

For more details on independent study, please refer to Registration in Independent Study Courses in the Academic Policies and Regulations section of this catalog.

## Interdisciplinary Study Courses

Interdisciplinary study (IDS) courses provide opportunities for students to benefit from collaboration by faculty from a range of disciplines. Courses with an IDS course code are normally co-taught by two or more faculty members and focus on topics beyond those offered in existing courses. Prerequisites: topic specific. Lab/Tech fee may apply.

IDS courses at the 300 level require sophomore standing or above; 400-level IDS courses are restricted to junior standing and above.

Descriptions of particular IDS courses are made available during registration.

## Special Topic Courses

**Special Topic (1 to 4 credit hours).** Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit. Prerequisites: topic specific. Lab/Tech fee may apply.

Special topic courses are numbered as 194, 294, 394 or 494 courses. The three-letter course prefix reflects the field of study of the course.

Special topic courses at the 300 level require sophomore standing or above; 400-level special topic courses are restricted to junior standing and above.

Special topic courses in accounting are restricted to students in accounting and finance.

Descriptions of particular special topic courses are made available in the school during registration.

# Full-Time Faculty

The following pages list the full-time AUS faculty members with their terminal degrees, the conferring institution, the AUS department they are members of, as well as administrative positions they hold in addition to their faculty title. This information is also available at www.aus.edu/faculty-hub.

For details on the research achievements, research interests and experience of full-time AUS faculty members, visit www.aus.edu/research/impact/faculty-research.

## A

**Abdalla, Jamaleldin**, PhD, University of California at Berkeley, 1989; Professor in Civil Engineering and Riad T. Sadek Chair in Civil Engineering

**Abdallah, Abed Al-Nasser**, PhD, University of Lancaster, 2004; Professor in Accounting and Head, Department of Accounting

**Abdelfatah, Akmal**, PhD, University of Texas at Austin, 1999; Professor in Civil Engineering

**Abdelgawad, Mohamed,** PhD, University of Toronto, 2009; Associate Professor in Mechanical Engineering

**Abdel-Hafez, Mamoun**, PhD, University of California at Los Angeles, 2003; Professor in Mechanical Engineering and Head, Department of Mechanical Engineering

**Abdel-Jabbar, Nabil**, PhD, University of Michigan, 1996; Professor in Chemical Engineering

**Abdel Naby, Shahin**, PhD, Western Michigan University, 2010; Assistant Professor in Physics

**AbdulHadi, Zayid**, PhD, Laval University, 1987; Professor in Mathematics and Statistics

**Abdul-Latif, Akrum**, PhD, University of Technology of Compiègne, 1994; Visiting Professor in Mechanical Engineering

**Abed, Farid**, PhD, Louisiana State University, 2005; Professor in Civil Engineering

**Abouleish, Mohamed Yehia**, PhD, Tennessee Technological University, 2003; Associate Professor in Biology, Chemistry and Environmental Sciences

**Abu Al-Foul, Bassam**, PhD, University of Utah, 1994; Professor in Economics

**Abualrub, Taher**, PhD, University of Iowa, 1998; Professor in Mathematics and Statistics

**Abukhaled, Marwan**, PhD, Texas Tech University, 1995; Professor in Mathematics and Statistics (on sabbatical Spring 2021)

**Abu-Lebdeh, Ghassan**, PhD, University of Illinois at Urbana-Champaign, 1999; Professor in Civil Engineering and PhD-ESM Program Academic Coordinator

**Abu-Nabah, Bassam**, PhD, University of Cincinnati, 2007; Associate Professor in Mechanical Engineering

**Abu-Rukba, Ra'afat**, PhD, Western University, 2013; Assistant Professor in Computer Science and Engineering

**Abusalim, Alaanoud**, MA, Southern Illinois University, Carbondale, 2006; Senior Instructor in English

**Abu-Yousef, Imad**, PhD, McGill University, 1996; Professor in Biology, Chemistry and Environmental Sciences

**Abuzaid, Wael**, PhD, University of Illinois, 2012; Assistant Professor in Mechanical Engineering

**Agha, Albert**, C. Phil, University of California, Los Angeles, 2017; Assistant Professor in Performing Arts

**Aghasi, Maya**, PhD, University of Wisconsin Madison, 2012; Assistant Professor in English (on leave Fall 2020)

**Aguir, Iness**, PhD, University of Texas at San Antonio, 2013; Assistant Professor in Finance

**Ahmad, Irtishad,** PhD, University of Cincinnati, 1998; Professor and Head, Department of Civil Engineering

**Ahmad, Norita**, PhD, Rensselaer Polytechnic Institute, 2001; Associate Professor in Marketing and Information Systems, Director, Faculty Development Center

**Ahmed, Khawlah**, PhD, State University of New York at Buffalo, 1998; Professor in English

**Ahmed, Mohammad**, PhD, McMaster University, 2008; Visiting Assistant Professor in Mechanical Engineering

**Ahmed, Rana**, PhD, Duke University, 1991; Professor in Computer Science and Engineering

**Ahmed, Vian**, PhD, Loughborough University, 2000; Professor in Industrial Engineering and Director, Alternative Delivery Graduate Education

**Ajšić, Adnan**, PhD, Northern Arizona University, 2015; Assistant Professor in English

**Al-Ali, Abdul-Rahman**, PhD, Vanderbilt University, 1990; Professor in Computer Science and Engineering

**Al-Aomar, Raid**, PhD, Wayne State University, 2000; Associate Professor in Industrial Engineering

**Al-Asheh, Sameer**, PhD, University of Ottawa, 1997; Professor in Chemical Engineering and Interim Head, Department of Chemical Engineering

**Al-Assadi, Wesam**, MA, American University of Sharjah, 2004; Instructor in Arabic and Translation Studies

**Al-Attar, Mariam**, PhD, University of Leeds, 2008; Lecturer in Arabic and Translation Studies

**Albasha, Lutfi**, PhD, University of Leeds, 1995; Professor in Electrical Engineering

**AlHamaydeh, Mohamed**, PhD, University of Southern California, 2005; Professor in Civil Engineering

**Ali, Ahmed**, PhD, University of Durham, 1999; Professor in Arabic and Translation Studies

**Ali, Tarig**, PhD, The Ohio State University, 2003; Professor in Civil Engineering

**Al-Issa, Ahmad**, PhD, Indiana University of Pennsylvania, 1998; Professor in English and Associate Dean for Undergraduate Affairs, College of Arts and Sciences

**Alkafaji, Yass**, DBA, Mississippi State University, 1983; Professor in Accounting

**Al-Kaisi, Meis**, PhD, University of London, 2006; Assistant Professor in Arabic and Translation Studies

**Al-Khader, Maen**, PhD, Illinois Institute of Technology, 2008; Associate Professor in Mechanical Engineering

**AlKhazali, Osamah**, PhD, University of Memphis, 1997; Professor in Finance and Head, Department of Finance

**Al-Kofahi, Osameh**, PhD, Iowa State University, 2009; Visiting Assistant Professor in Computer Science and Engineering

**Al-Najjar, Abeer**, PhD, University of Edinburgh, 2003; Associate Professor in Mass Communication

**Alnaser, Ali Sami**, PhD, Western Michigan University, 2002; Professor in Physics; Head, Department of Physics and PhD-MSE Program Academic Coordinator

**Al-Nashash, Hasan**, PhD, Kent University, 1988; Professor in Electrical Engineering

**Alobaidi, Ghada**, PhD, University of Western Ontario, 2000; Associate Professor in Mathematics and Statistics

**Al-Othman, Amani**, PhD, University of Ottawa, 2012; Associate Professor in Chemical Engineering

**Aloul, Fadi**, PhD, University of Michigan, 2003; Professor in Computer Science and Engineering; Head, Department of Computer Science and Engineering; HP Institute Director

**Al-Sayah, Mohamed**, PhD, University of Alberta, 2002; Professor in Biology, Chemistry and Environmental Sciences

**Al Shaar, Nuha**, PhD, University of Cambridge, 2010; Associate Professor in Arabic and Translation Studies (on sabbatical Fall 2020)

**Alshraideh, Hussam**, PhD, The Pennsylvania State University, 2011; Associate Professor in Industrial Engineering

**Al-Tamimi, Adil**, PhD, Strathclyde University, 1990; Professor in Civil Engineering

**Alzaatreh, Ayman**, PhD, Central Michigan University, 2011; Associate Professor in Mathematics and Statistics

**Anabtawi, Mahmoud**, PhD, University of Texas, 1998; Professor in Mathematics and Statistics and Dean, College of Arts and Sciences

**Anderson, Pia-Kristina**, PhD, University of California at Berkeley, 2001; Assistant Professor in International Studies

**Angell, Linda**, DBA, Boston University, 1996; Director, International Exchange Office

**Aqeel, Mohammed Taher,** MA, Jawaharlal Nehru and Delhi University, 1993; Professor of Practice in Civil Engineering

**Arenfeldt, Pernille**, PhD, European University Institute, 2006; Associate Professor in International Studies

**Arzaghi, Mohammad**, PhD, Brown University, 2005; Associate Professor in Economics (on sabbatical Spring 2021)

**As'ad, Rami**, PhD, Concordia University, 2011; Assistant Professor in Industrial Engineering

**Asa'd, Randa**, PhD, University of Cincinnati, 2012; Assistant Professor in Physics

**Aslan, Neslihan,** MA, Bosphorus University, 2006; Instructor in English

**Atabay, Serter**, PhD, University of Birmingham, 2001; Professor in Civil Engineering

**Attom, Mousa**, PhD, Kansas State University, 1989; Professor in Civil Engineering

**Audi, Diana**, MS, American University of Beirut, 2005; Senior Instructor in Mathematics and Statistics

**Aveyard, Mark**, PhD, Florida State University, 2007; Associate Professor in International Studies

**Awad, Mahmoud**, PhD, Wayne State University, 2005; Professor in Industrial Engineering

**Ayish, Mohammad**, PhD, University of Minnesota, 1986; Professor in Mass Communication and Head, Department of Mass Communication

## B

**Badawi, Ayman**, PhD, University of North Texas, 1993; Professor in Mathematics and Statistics

**Badran, Sammy**, PhD, University of Kansas, 2018; Assistant Professor in International Studies

**Badri, Hadeyeh**, MFA, SAIC, 2020; Lecturer in Art and Design

**Baghestani, Hamid**, PhD, University of Colorado, 1982; Professor in Economics

**Bahloul, Maher**, PhD, Cornell University, 1994; Associate Professor in English

**Bahroun, Zied**, PhD, University of Franche-Comté, Besancon, 2000; Associate Professor in Industrial Engineering

**Baker, Cynthia**, MBA, Texas Tech University, 1997; Senior Instructor in Management

**Baker, Jeffrey**, PhD, Texas Tech University, 2008; Professor in Marketing and Information Systems; Faculty Advisor, Student Council

**Barlas, Gerassimos**, PhD, National Technical University, Athens, 1996; Professor in Computer Science and Engineering

**Bartholomew, Aaron**, PhD, College of William and Mary, 2001; Professor in Biology, Chemistry and Environmental Sciences

**Basco, Rodrigo**, PhD**,** Universidad Complutense de Madrid, 2005; Associate Professor of Management and Sheikh Saoud bin Khalid bin Khalid Al-Qassimi Chair in Family Business

**Beamer, Rebecca**, MFA, University of Alabama, 2016; Assistant Professor in Art and Design

**Beheiry, Salwa**, PhD, University of Texas at Austin, 2005; Associate Professor in Civil Engineering

**Bejarano Rodriguez, Ivonne**, PhD, University of Puerto Rico, 2013; Assistant Professor in Biology, Chemistry and Environmental Sciences

**Bejtic, Zinka**, PhD, International University of Sarajevo, 2018; Associate Professor in Art and Design; and Associate Dean, College of Architecture, Art and Design

**Belhamadia, Youssef**, PhD, Laval University, 2004; Associate Professor in Mathematics and Statistics

**Belkhodja, Omar**, PhD, Laval University, 2006; Associate Professor in Management (on sabbatical Spring 2021)

**BenDaya, Mohamed**, PhD, Georgia Tech USA, 1998; Professor in Industrial Engineering

**Bennett, Haydn**, PhD, Strathclyde University, 2002; Visiting Associate Professor in Management

**Best, Kathryn**, MA, Kingston University, 2005; Associate Professor in Art and Design

**Bilikozen, Neslihan**, PhD, University of Exeter, 2016; Assistant Professor in English

**Blumi, Isa**, PhD, New York University, 2005; Associate Professor in International Studies

**Bodolica, Virginia**, PhD, HEC Montreal Business School, 2006; Professor in Management and Said T. Khoury Chair in Leadership Studies

**Boisvert, Jean**, PhD, Macquarie Graduate School of Management, 2007; Associate Professor in Marketing and Information Systems

**Boubakri, Narjess**, PhD, Laval University, 2000; Professor in Finance; Dean; School of Business Administration; and Bank of Sharjah Chair in Finance

**Bou-Mehdi, Randa**, MA, American University of Sharjah, 2010; Senior Instructor in English

**Breslow, Harris**, PhD, University of Illinois, Champaign-Urbana, 1995; Associate Professor in Mass Communication

**Brodtkorb, Tor**, LLM, University of Leicester, 2008; Assistant Professor in Management

**Buck, Rachel**, PhD, University of Arizona, 2018; Assistant Professor in English

## C

**Carlow, Jason**, MArch, Yale University, 2002; Associate Professor in Architecture

**Castillo Melo, Roberto**, PhD, University of Kansas, 2015; Assistant Professor in Architecture

**Cerro, Camilo**, MArch, Columbia University, 1997; Associate Professor in Architecture

**Chan, Stephen**, PhD, University of Manchester, 2016; Assistant Professor in Mathematics and Statistics

**Chathoth, Prakash**, PhD, Virginia Polytechnic Institute and State University, 2002; Professor in Marketing and Information Systems

**Chavez, Daniel**, MArch, University of New Mexico, 2000; Professor of Practice in Architecture

**Chazi, Abdelaziz**, PhD, University of North Texas, 2004; Professor in Finance

**Chebbi, Rachid**, PhD, Colorado School of Mines, 1991; Professor in Chemical Engineering

**Chiozza, Giacomo**, PhD, Duke University, 2004; Associate Professor in Political Studies and Sir Easa Saleh Al Gurg Professor in International Studies

**Christodoulides, Georgios**, PhD, University of Birmingham, 2016; Professor in Marketing and Information Systems and Chalhoub Professor in Luxury Brand Management

**Cobo-Reyes Cano, Ramon**, PhD, University of Granada, 2006; Associate Professor in Economics

**Conty, Arianne**, PhD, University of California, 2009; Associate Professor in International Studies

**Craven, Laurence**, MA, Oxford Brookes University, 2009; Senior Lecturer in English

**Curabba, Brad**, MAT, SIT Graduate Institute, 2006; Senior Instructor in English

**Curiel, Igor**, PhD, Kumamoto University, 1989; Professor of Practice in Architecture

**Curran, Paula**, MFA, University of Illinois at Urbana-Champaign, 1993; Associate Professor in Art and Design

## D

**Daghfous, Abdelkader**, PhD, Pennsylvania State University, 1997; Professor in Marketing and Information Systems

**Dahdal, Suheil**, PhD, University of Technology, Sydney, 2000; Associate Professor in Mass Communication

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