

ARC 201 Architectural and Interior Design Studio I (12-0-6). (Cross-listed as IDE 201). Studio-based investigation of the fundamentals of making architectural form and space with emphasis on design inquiry, exploration and process. Concentrates on classic instances of form sources in architectural and interior design: function, experience, structure, construction and context. Digital media are integral to the studio, and students receive instruction in software appropriate for design purposes. Prerequisites: DES 100, DES 111, DES 112, DES 121, DES 122, DES 131, DES 132, WRI 101 or WRI 102 and MTH 003 or MTH 111 or MTH 103. Lab/tech fee rate B applies.

ARC 202 Architectural and Interior Design Studio II (12-0-6). (Cross-listed as IDE 202). 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, and students receive continued instruction and practice in software appropriate for design. Prerequisites: ARC 201 or IDE 201. Lab/tech fee rate B applies.

ARC 213 Analysis and Methods in Architecture (3-0-3). (Formerly ARC 212). Introduces models of process and conception in architectural design, addressing fundamental concepts of method, spatial organization, material, structure and context as aspects of a comprehensive design intention. Course format includes lectures, seminars, field visits and readings. Assignments involve written and graphic communication. Prerequisite/concurrent: ARC 201 or IDE 201.

ARC 215 Descriptive Geometry (4-0-3). Introduces concepts and practices of the precise description of form in space. Includes systematic treatment of projection systems, including orthographic, oblique and perspective projections. Instruction and assignments involve both traditional and digital design media. Course format includes lectures and supervised applications. Prerequisite/concurrent: ARC 201 or IDE 201. Lab/tech fee rate A applies.

ARC 224 Modern Foundations of Art and Architecture (3-0-3). (Formerly ARC 220). Covers principles and practices fundamental to an understanding of the art and architecture of the modern era. Presentation integrates history and theory with practical design and application and proceeds topically rather than chronologically. Prerequisites: WRI 102, and ARC 201 or IDE 201.

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 Survey of Materials and Practices in Construction (3-0-3). (Formerly ARC 231). Surveys building materials and their properties, assembly sequences and methods of construction in the context of their influence on the form, cost and quality of the built environment. Uses a case study approach to demonstrate both the continuing evolution of the building process and the timeless nature of the issues involved. Course format includes lectures and supervised applications. Prerequisite: ARC 201 or IDE 201.

ARC 242 Statics and Mechanics of Materials for Architecture (3-1-3). (Formerly ARC 240). Covers static equilibrium of forces and free body diagrams; analysis of simple beams, columns and trusses; truss forms, configuration and performance; tributary loads, load path and load tracing in structural systems; simple funicular forms (arches and cables); geometric properties and forms of flexural elements (centroid and moment of inertia); internal forces (bending moment and shear force diagrams in beams); axial stress and strain; bending and shearing stresses; mechanical properties of common building materials; and tensile, compression, and bending and torsion tests for different building materials (steel, concrete, wood). Prerequisite: PHY 104; prerequisite/concurrent: ARC 201 or IDE 201. Lab/tech fee rate A applies.

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. Prerequisites: PHY 104, and ARC 202 or IDE 202.

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. Prerequisites: ARC 301 and ARC 213.

ARC 311 Illustration and Rendering (4-0-3). (Cross-listed as IDE 311). 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 312 Advanced Representation (4-0-3). Expands on representational techniques. Focuses on the application and use of these techniques in the presentation and representation of design concepts and drawing compositions. Introduces color drawing techniques using mixed media of hand drawing and computer generated drawings and illustrations, photomontage and collage. Prerequisite/concurrent: ARC 201 or IDE 201. Lab/tech fee rate B applies.

ARC 315 Modeling and Rendering (4-0-3). (Cross-listed as IDE 315) (Formerly ARC 310). Presents a rationalized, geometrical approach to the conception and description of form. Selected examples of architectural form are first rigorously analyzed to re-derive their constructional logic and then are “built” as detailed electronic models. Students explore the potential of digital design technologies as instruments to achieve vivid, authentic, holistic simulations of architectural reality, appropriate to the testing of architectural ideas. Taught in a modified studio format. Prerequisite: ARC 301 or IDE 301. 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. Prerequisites: ARC 224 and PHY 104.

ARC 325 Ideas in Architecture (3-0-3). (Formerly ARC 321). Introduces the conceptual basis of the work of specific architects, historical and contemporary architectural historians and theoreticians, and schools of thought in architecture with an emphasis on the understanding of both written and visual analysis of built form and design. Prerequisite: ARC 224.

ARC 333 Rough Construction Process (3-0-3). (Formerly ARC 330). Offers an in-depth presentation of contemporary regional construction practices used to prepare the sites and to erect the building’s basic structure. These include site preparation; foundations; concrete, steel and timber structures; and masonry work. Discusses the basics of producing construction drawings. Prerequisite: ARC 232.

ARC 344 Structural Design for Architects (3-1-3). (Formerly ARC 342). Covers classification of structural elements and systems. Includes analysis and behavior of structural elements and systems (simple beams, comprehensive members, continuous beams, frames, plates, membranes and shells): the relationship between behavior of structural elements used in architecture and their forms; the structural design process, codes and specifications; qualitative and preliminary selection of steel and concrete structural elements; types and behavior of structural connections; and types and behavior of foundations. Prerequisite: ARC 242. Lab/tech fee rate A applies.

ARC 354 Environmental Energies and Building Form (3-0-3). (Formerly ARC 351). 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. Prerequisite: PHY 104; prerequisite/concurrent: ARC 301.

ARC 364 Introduction to Computer-Aided Drawing (0-2-1). (Cross-listed as IDE 364). (May test out of course). Provides training for mainstream CAD applications using the Windows operating system. Develops basic familiarity and proficiency with applications commonly encountered during professional training. Graded as P/F. Prerequisite: ARC 202 or IDE 202. Lab/tech fee rate B applies.

ARC 365 Computer-Aided Design (4-0-3). (Cross-listed as IDE 365) (Formerly ARC 371). Systematically introduces computer-aided architectural design. Discussion and training focuses on a variety of CAAD applications in order to show the similarities (basic principles of CAAD) as well as the idiosyncrasies of the individual applications. Includes modeling of existing buildings utilizing CAAD applications from the core software suite utilized by SA&D. Topics include objects, layers, classes, dimensions, units, scales, groups, symbols, different description models in 3D, levels of precision, different construction methods and work strategies. Prerequisite: ARC 201 or IDE 201. Lab/tech fee rate B applies.

ARC 366 Applied Computer-Aided Design (4-0-3). (Cross-listed as IDE 366). Systematically introduces the basic practice of computer-aided architectural design. Presentation and training focuses on two mainstream production CAAD applications, ArchiCAD and AutoCAD, with the intent to develop basic familiarity and proficiency with the applications most likely be encountered in offices during professional training. Introduces AutoCAD on PCs running the Windows NT operating system. Extends the topics introduced in ARC 365 to include detailed treatment of tool palettes and inter-platform compatibility. Prerequisite: ARC 201 or IDE 201. Lab/tech fee rate B applies.

ARC 374 Environmentally Sustainable Design (4-0-3). (Cross-listed as IDE 374). Develops a greater focus on holistic and sustainable approaches to design. Covers issues such as demand and supply of energy and water and the generation of waste. Reiterates the principles of reduce, reuse and recycle. Predominant emphasis is on practical strategies directly applicable in design. Material is presented as lectures and seminars, supplemented with readings. Prerequisite/concurrent: PHY 104 or PHY100 or PHY 101.

ARC 397 Internship in Architecture I (0-0-0). Requires a minimum of six weeks of approved professional experience. Requires students to document the work undertaken in a formal report submitted to the department by the beginning of the following term. Graded as P/F. Registration fee applies. Prerequisite: ARC 302.

ARC 401 Architectural Design Studio V (12-0-6). Requires design of open site projects of moderate scale with emphasis on building form derived from the analysis of site context and site planning strategies. Prerequisites: ARC 224, ARC 232, ARC 302 and ARC 242.

ARC 402 Architectural Design Studio VI (12-0-6). Comprises a comprehensive building design project integrating building technologies with other non-technical design issues. Introduces programming and includes a detailed, design development of an aspect of building technology. Prerequisites: ARC 325, ARC 333, ARC 397 and ARC 401; prerequisite /concurrent ARC 354.

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: ARC 202 or IDE 202.

ARC 434 Finish Construction Process (3-0-3). (Formerly ARC 431). Examines in-depth the trades and processes involved in finishing a building. These are the major components that are built following the erection of the building's basic structure, including stairs, doors, windows, partitions, ceilings, floors, claddings and joints. Discusses design considerations and construction methods with hands-on experience in producing detailed drawings of some elements. Prerequisite: ARC 333.

ARC 436 Working Drawings (4-0-3). (Formerly ARC 472). Introduces the production of working drawings used in the building industry. A preliminary building design is developed to produce a set of complete architectural working drawings. Emphasizes the

use of computer technology in drawing production and information coordination. Prerequisite: ARC 301 or IDE 301.

ARC 455 Environmental Control Systems (3-0-3). (Formerly ARC 452). 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: ARC 354.

ARC 461 Project Management (3-0-3). (Cross-listed as IDE 461 and DES 461). Introduces the basic and advanced concepts of running design projects. Explores the design process and project phases, analyzing them in detail under the project management concept of delivering projects “on time, on budget, every time.” Prerequisite: senior standing.

ARC 462 Design Management (3-0-3). (Cross-listed as IDE 462 and DES 462) (Formerly ARC 460). Introduces the principles and practices of the economic and commercial aspects of architectural and 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 architectural office. Prerequisite: ARC 397 or IDE 397 or DES 397.

ARC 465 Advanced Computer-Aided Design (4-0-3). (Cross-listed as IDE 465). 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 471 Site Planning (4-0-3). Focuses on the site as a fundamental component of building design. Examines the interrelationship of intended site use with the environment. Examines topography, vegetation and landscape, climate, geography as well as theoretical aspects of site development. Emphasizes the synthesis of programmatic and environmental requirements into a coherent concept for building placement and site improvements. Prerequisite: ARC 302.

ARC 473 Introduction to Landscape Architecture (4-0-3). Introduces the techniques of site inventory, analysis and design. Specific skills in reading and modifying topography, understanding micro-climatic influences, vehicular and pedestrian access, formal and functional relationships to surrounding buildings, respect for ecology and other site and site-use factors are treated in lecture/demonstration class settings. Prerequisite: ARC 302.

ARC 493 Study Abroad (1 to 3 credits). Features on-site visits offering the opportunity to experience first-hand regional and international design practices, highlighting particular themes relevant to the specific location. Department permission is required for enrollment and credit. Prerequisite: ARC 302 or IDE 302.

ARC 497 Internship in Architecture II (0-0-0). Requires a minimum of eight weeks of on-the-job experience with an approved professional firm. Requires students to document the work undertaken in a formal report submitted to the department by mid-semester of the following term. Graded as P/F. Registration fee applies. Prerequisite: ARC 402.

ARC 498 Studio Abroad (3 to 6 credits). Provides studio activities conducted in regional and international sites promoting a global-oriented approach to design. Prerequisite: studio specific.

ARC 505 Architectural Design Studio VII (12-0-6). Requires research-directed investigation involving architecture and urban design. Prerequisites: ARC 402 and ARC 344.

ARC 506 Architectural Design Studio VIII (12-0-6). Research-directed design studio based on a topic related to some aspect of architectural design (history/theory, technology, representation, urban or heritage resource management, etc.). Students pursue directed research in support of a design investigation. Prerequisites: ARC 402 and ARC 497.

ARC 520 Architectural Criticism (4-0-3). Addresses a coherent understanding of contemporary architecture by focusing on readings, discussions and presentations in order to mature the student’s cognition to today’s architectural strategies. Prerequisite:

ARC 325.

ARC 530 Case Studies in Building Construction (4-0-3). Provides in-depth study of the interrelationship of building construction and architectural design with consideration of the design development, taking into account the resulting changes throughout the development of a design. Students gain the ability to assess and analyze the relationship between tectonics and architecture, as well as to apply this to their own design work. Prerequisite: ARC 333.

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 571 Fundamentals of Urban Planning (3-0-3). (Cross-listed as UPL 501). 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, engineering, etc. Provides an overview of what planners do and the tools they use in their practice. Prerequisites: ARC 402 and CGPA of 2.5 or above.

ARC 573 Principles of Urban Design (3-0-3). (Cross-listed as UPL 582). 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. Prerequisites/concurrent: ARC 402 and CGPA of 2.5 or above.

ARC 591 Final Project Research (6-0-3). Requires students to choose a design topic with the guidance of an advisor and approval of the faculty. Each student prepares an individual program for ARC 592 Final Project Design, concluding with a formal, bound document. Prerequisites: ARC 344, ARC 462 or IDE 462; ARC 402, ARC 434, ARC 455; and consent of the department.

ARC 592 Final Project Design (12-0-6). Requires individual resolution of the design problems initiated in ARC 591, prepared under the guidance of a selected faculty advisor, presented and defended in a formal public critique. This course may substitute for ARC 506. Prerequisites: ARC 497, ARC 505, ARC 591 and consent of the department.