



Civil Engineering **Outreach Program**

Your partner for collaborative research, consultation and training

- Construction Materials and Quality Control
- Structural Engineering
- Transportation Engineering
- Environmental Engineering
- Water Resources Engineering
- Geotechnical Engineering
- Construction Management

Welcome to the Department of Civil Engineering at American University of Sharjah (AUS).

Blending the best of North American educational and research practices with advanced methods and international trends, our department provides degree programs and engineering research that are relevant to industry in the Middle East and across the world. Through our Outreach Program, we transfer research and knowledge to industry, collaborating with companies and government entities to develop innovative solutions.

Our department is a trusted partner of industry for many reasons, including:

International Recognition

Our programs are widely recognized for their excellence. The Bachelor of Science degree program in civil engineering offered by the College of Engineering is accredited by the Engineering Accreditation Commission of ABET, abet.org, the global accreditor of college and university programs in applied and natural science, computing, engineering and engineering technology. AUS was the first university in the Gulf region and the second outside the United States to receive this accreditation. AUS is ranked number one (tied) in the UAE and among the top 200 universities globally for civil and structural engineering, according to QS World University Subject Rankings (2021).

Faculty

Our civil engineering faculty members are experienced in conducting applied research and have a proven track-record of success in external cooperation. Our faculty have global experience, with many hailing from prestigious universities in North America. They also have a comprehensive understanding of this region's distinct needs and challenges. Their experience includes applying advanced techniques to solve difficult problems, improve system performance, design innovative solutions, and assist collaborators with their research, consultation and training needs.

Facilities and Resources

Our civil engineering faculty members are experienced in conducting applied research and have a proven track-record of success in external cooperation. Our industry partners can benefit from a diverse selection of well-equipped facilities, including:

- Asphalt and Highway Laboratory
- Environmental Engineering Laboratory
- Fluid Mechanics and Hydraulics Engineering Laboratory
- Geology and Subsurface Exploration Laboratory
- Geotechnical Engineering Laboratory
- Geographic Information System and Mapping Laboratory
- Structures and Construction Material Laboratory
- Surveying Laboratory

Your organization can become involved in our Outreach Program through:

- participation in **collaborative research** that address your organization's needs
- becoming an annual **sponsor of ongoing research**
- requesting **consultation services** on specific projects
- utilizing Department of Civil Engineering personnel for **training and continuing education**

Sponsorship Opportunities

Annual sponsors of our ongoing research help guide the research priorities of the outreach groups, and are entitled to access to project data, reports and designs. Annual sponsors also receive recognition for their support by having their logo appear on outreach promotional materials (if desired), and by being mentioned in publications of research efforts. Priority access to outreach personnel is also granted to annual sponsors for their ongoing research, review and evaluation needs.

Our Outreach Program can respond to your organization's interests and needs. We look forward to hearing from you.

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Construction Materials and Quality Control

The Construction Materials and Quality Control group focuses on the study of the characterizations of various construction materials—both traditional and advanced—and their applications in the construction industry.

Focus areas

- concrete
- composites
- steel
- fibers
- asphalt
- 3D concrete printing
- blocks
- nanomaterials
- sustainable materials

Industries served

- civil engineering consultants
- construction contractors
- oil
- municipalities and governmental agencies
- public works and housing

Services offered

- characterization of construction materials
- quality control
- sustainable materials and construction
- testing of material properties

Group experience

Examples of past projects include experimental testing and evaluation of construction materials, concrete, steel, corrosion, high-performance materials, nanomaterials, composite structures, bonds between concrete layers, harsh environment exposures, monitoring and testing, sustainability applications and evaluation in buildings, and BIM in modelling of energy in green buildings.

Program group leaders

Adil K. Al-Tamimi, PhD, University of Strathclyde, UK
Research interests: Sustainable/green concrete, 3D concrete printing, engineering cementitious composite

Rami A. Hawileh, PhD, University of Wisconsin-Milwaukee, USA

Research interests: Structural and computational mechanics, strengthening and rehabilitation of structures, fire resistance

Farid H. Abed, PhD, Louisiana State University, USA
Research interests: FRP and FRCM composites, steel, aluminum, concrete-filled steel tubes (CFST)

Partners and clients

- Hilti International Cooperation
- Arabtec Company
- UAE Global Aluminium
- Materials Lab
- Digital Solutions Dubai
- UAE Green Buildings Council
- Al Ghurair Group Companies
- CONMIX
- Sharjah Research & Innovation Park
- Sharjah Research Academy
- Ministry of Public Works and Housing
- Dubai Municipality
- BASF
- Sharjah Town Planning and Survey
- Wacker Polymers
- RMC
- Degussa Middle East

Structural Engineering

The Structural Engineering Group is concerned with the planning, analysis, design, maintenance and rehabilitation of a wide range of infrastructures, such as buildings, bridges, roads, dams, water tanks, underground constructions, offshore platforms, pipelines and hydraulic structures.

Focus areas

- analysis and design of structures
- civil engineering infrastructure
- lab testing of civil engineering materials and structures
- finite element analysis
- structural reliability
- training courses in all areas of structural engineering, strengthening of structures, and computational mechanics

Industries served

- civil engineering consultants
- construction
- oil
- municipalities and governmental agencies
- public works and housing

Services offered

- static and dynamic structural analysis
- finite element analysis
- analysis of existing building
- rating of existing bridges
- fire resistance and thermal-stress analysis
- strengthening and rehabilitation of structures

Group experience

Examples of past projects include experimental testing of concrete and steel structures, steel bridge design training, bridge engineering, round panel tests, structural safety and finite element analysis training, nonlinear static and dynamic analysis of offshore platforms, workshops on earthquake resistance and fire safety design of structures, and training on strengthening and rehabilitation of concrete structures.

Partners and clients

- US Environmental Protection Agency
- US Bureau of Reclamation
- Trojan Technologies, Inc.
- Expo 2020
- Celer Group
- MAPEI
- Malcolm-Pirnie
- Consolidated Contractors International Company (CCIC)
- Darwish Engineering
- Ministry of Public Works and Housing
- Roads and Transport Authority (RTA), Dubai
- Dubai Municipality
- Sharjah Town Planning and Survey Directorate
- Abu Dhabi Municipality
- Sharjah Municipality
- Ajman Municipality
- Italconsult (Dubai Branch)
- Emirates Transportation and Traffic (ET&T)
- Wacker Polymers
- RMC
- Degussa Middle East

Program group leaders

Sami W. Tabsh, PhD, University of Michigan, USA

Research interests: Structural reliability, bridge structures, behavior of reinforced concrete

Jamal A. Abdalla, PhD, University of California at Berkeley, USA

Research interests: Computer-aided analysis and design of structures, earthquake engineering and structural dynamics, computational mechanics and materials

Adil K. Al-Tamimi, PhD, University of Strathclyde, UK

Research interests: Sustainable/green concrete, nano and composite materials, 3D concrete printing

Sherif M. Yehia, PhD, University of Nebraska, USA

Research interests: Behavior of reinforced and prestressed concrete, composite structures, infrastructure management systems

Mohammad AlHamaydeh, PhD, University of Southern California, USA

Research interests: Structural earthquake engineering and seismic risk assessment, structural health monitoring and damage detection, nonlinear finite element modeling incorporating advanced materials (FRC, HPFRC, UHPFRC, ECC)

Farid Abed, PhD, Louisiana State University, USA

Research interests: Advanced structural analysis, mechanics of concrete and composites, nonlinear finite element analysis

Rami A. Hawileh, PhD, University of Wisconsin-Milwaukee, USA

Research interests: Structural and computational mechanics, strengthening and rehabilitation of structures, fire resistance

Transportation Engineering

The Transportation Engineering Group is concerned with the planning, design, management and operations of a wide range of transportation systems, such as roadway networks design, transit systems, traffic signal systems and master transportation plans.

Focus areas

- traffic studies
- geographic information systems (GIS) and satellite remote sensing (SRS) applications in transportation
- transportation planning studies
- impact of transportation on public health
- intelligent transportation systems (ITS)
- traffic simulation
- training courses in the areas of transportation systems planning, design and operations

Industries served

- transportation engineering consultants
- municipalities and local and federal governmental agencies

Group experience

Examples of past projects include several traffic and transportation planning studies in the GCC and United States.

Services offered

- transportation planning
- highway design
- traffic impact studies
- transit systems planning and operations
- ITS applications
- traffic signal systems design and operation
- surveying and mapping applications
- GIS and SRS applications

Partners and clients

- US FHWA
- Tx-DOT
- Ministry of Public Works and Housing, UAE
- Roads and Transport Authority (RTA), Dubai
- Roads and Transport Authority (RTA), Sharjah
- Dubai Municipality
- Sharjah Town Planning and Survey Directorate
- Abu Dhabi Department of Transport (DoT)
- Sharjah Municipality
- Ajman Municipality
- Italconsult (Dubai Branch)
- Emirates Transportation and Traffic (ET&T - Dubai)
- Al Suweidi Engineering Consultants
- Al-Burj Engineering Consultants, Abu Dhabi

Program group leaders

Ghassan Abu Lebdeh, PhD, University of Illinois at Urban-Champaign, USA

Research interests: Optimization of traffic operations, health/sustainability in transport systems

Tarig Ali, PhD, Ohio State University, USA

Research interests: GIScience, LiDAR mapping, applications of GIS and Satellite Remote Sensing in transportation engineering, GNSS applications, infrastructure monitoring/surveillance

Akmal Abdelfatah, PhD, University of Texas–Austin, USA

Research interests: Intelligent Transportation Systems (ITS) applications, dynamic traffic assignment, traffic signal design and operations, traffic flow theory, operations research applications in transportation networks, and urban transportation systems planning and analysis

Geotechnical Engineering

The Geotechnical Engineering Group provides design and testing services for all geotechnical problems involving static and dynamic loads. Utilizing the latest analytical and experimental techniques and equipment, the geotechnical engineering group offers a wide range of services.

Focus areas

- seismic hazard analysis
- foundation engineering
- dynamic and static characterization of geomaterials in the field and laboratory

Industries served

- engineering consultants
- public and private agencies and municipalities

Services offered

- probabilistic seismic hazard analysis (PSHA)
- site response analysis
- foundation analysis and design
- seepage analysis
- groundwater modelling
- geophysical testing
- design of permanent and temporary retaining structures
- laboratory testing of geomaterials under static and dynamic loadings

Group experience

Professional research and design experience in public and private sectors has been provided in North America and the Middle East. Engineering services have been provided on projects such as highways, bridges, tunnels, dams, structures and offshore platforms.

Partners and clients

- Ontario Ministry of transportation (MTO) in Canada
- Consultants in Mexico
- Sharjah Municipality
- DEC consultants Dubai
- Binnie and Partners, UK
- Lehmeier International, Germany
- GDE consultants, Canada
- Worley-Parsons, USA

Program group leaders

Mousa Attom, PhD, Kansas State University, USA
Research interests: Soil behavior, soil stabilization, soil erosion and soil testing

Magdi El Emam, PhD, Queen's University, Canada
Research interests: Geosynthetics in geotechnical engineering, reinforced-soil retaining walls and embankments, and numerical and experimental modeling of geomaterials and composites

Zahid Khan, PhD, Western Ontario, Canada
Research interests: Dynamic characterization of geomaterials and seismic hazard analysis



Water Resources Engineering

The Water Resources Engineering group focuses on hydraulic and hydrologic modelling in light of climate change to assist in the development of sustainable environment.

Focus areas

- hydraulic and hydrologic modelling with the impact of climate change
- open channel hydraulics
- urban/industrial hydraulics
- environmental hydraulics
- hydraulic structures
- coastal engineering
- GIS-based mapping
- risk management

Industries served

- civil engineering consultants
- construction industries
- municipalities
- water utilities
- public works and housing

Services offered

- integrated water resources management
- hydraulic modelling
- coastal hydrology
- fluvial hydrology

Partners and clients

- Sharjah Electricity and Water Authority (SEWA)
- Dubai Electricity and Water Authority (DEWA)
- Sharjah Municipality
- Dubai Municipality
- Minister of Environment

Group experience

Examples of past projects include the modelling of water distribution networks, the -1D hydraulic modeling of Dubai Creek for water quality and the -3D hydrodynamic modelling for water circulation of the Arabian Gulf and of local lagoons in the UAE.

Program group leaders

Serter Atabay, PhD, University of Birmingham, UK
Research interests: Open channel and pipe flow hydraulics, coastal hydraulics, hydraulic structures, climate change and environmental hydrology and modelling

Tarig Ali, PhD, Ohio State University, USA
Research interests: GIS-based hydrology and hydraulic modeling, water leakage detection using geospatial techniques, remote sensing of the environment, applications of AI in geospatial analysis

Kazi Parvez Fattah, PhD, University of British Columbia, Vancouver, Canada
Research interests: Water quality modeling in distribution systems, pipe flow hydraulics, solar water desalination

Md Maruf Mortula, PhD, Dalhousie University, Canada
Research interests: Open channel hydraulics, climate change and environmental hydraulics and hydrology, water distribution system modeling and leak detection

Environmental Engineering

The Environmental Engineering group focuses on the study of sustainable water treatment and management, resource recovery and sustainability in built infrastructure.

Partners and clients

- Sharjah Electricity and Water Authority
- Sharjah Municipality
- Dubai Municipality
- Sharjah Research Academy
- Dubai Aluminium

Focus areas

- environmental protection of built infrastructure
- sustainable water and wastewater treatment
- resilient water distribution system
- environmental informatics
- resource recovery from waste

Industries served

- civil engineering consultants
- construction industries
- municipalities
- water utilities
- public works and housing

Services offered

- water quality testing
- analysis of waste materials
- evaluation of pipe materials and its role in water quality
- water quality analysis of different water bodies
- material recovery from wastewaters

Group experience

Examples of past projects include sustainable grey water recycling, evaluation of water quality in the distribution system, water quality evaluation of Dubai Creek, material recovery from reject brine from desalination plants, and composting of different solid wastes within the municipality.

Program group leaders

Md Maruf Mortula, PhD, Dalhousie University, Canada

Research interests: Water quality in distribution systems, leak detection in distribution systems, microplastic contamination in water supply systems, sustainability and resilience in water infrastructure

Kazi Parvez Fattah, PhD, University of British Columbia, Vancouver, Canada

Research interests: Sustainable water treatment and reuse, material recovery from waste, water quality in distribution systems, zero liquid discharge desalination

Tarig Ali, Ohio State University, USA

Research interests: GIS-based hydrology and water quality modeling, water leakage detection using geospatial techniques, remote sensing of the environment, applications of AI in geospatial analysis

Construction Management

The Construction Engineering and Management group is involved in all aspects of management of a construction project, including planning, scheduling, cost estimating and control. Applications of digital technology and incorporations of sustainability goals are the current research areas of the faculty.

Focus areas

- automation and digital technology in construction
- information and communication technology in construction
- sustainability in construction
- project delivery methods
- project management

Services offered

- construction scheduling
- cost engineering
- contract administration
- claims analysis
- dispute resolution
- project management
- project risk management

Industries served

- architecture/engineering/construction
- construction equipment
- construction software
- construction management

Group experience

Examples of past projects include development and applications of sustainability goals in construction projects, analysis of dispute resolution, low-cost housing, project delivery methods, integrated project delivery, and applications of digital technology in construction.

Partners and clients

- Sharjah Electricity and Water Authority
- Sharjah Municipality
- Dubai Municipality
- Sharjah Research Academy

Program group leaders

Salwa Beheiry, PhD, University of Texas at Austin, USA

Research interests: Best practices for sustainable development, sustainable construction, project planning and performance, and project and program benchmarking, engineering education and leadership, women in STEM

Sameh El-Sayegh, PhD, Civil Engineering, Texas A&M University, USA

Research interests: Construction and project management, project time and cost control, construction contracting, project risk management

Irtishad Ahmad, PhD, Civil Engineering, University of Cincinnati, Ohio, USA

Research interests: Construction organizations, information technology in construction, project delivery methods, concrete technology

About the College of Engineering

The College of Engineering at American University of Sharjah is known as one of the Middle East's leading engineering schools. Increasingly, the college is also becoming known as one of the region's leading contributors of engineering research.

Our innovative programs embody the vision of the university's founder, Sheikh Dr. Sultan bin Muhammad Al Qasimi, UAE Supreme Council Member and Ruler of Sharjah, who pointed to the fast pace of change in the pattern of education all over the world. "This is, as all of us know, caused by the revolutionary changes in the field of science and technology and advancement in telecommunication systems and information technology. No country can live in a state of isolation, and it has to learn to adjust to the social, cultural and economic needs," he stated.

Responding to this significant observation, CEN was committed from its very inception to charting a course capable of competing with the very best globally. We have succeeded in blending the best of North American educational practices with the methods used by the finest institutions in Europe and the Middle East.

www.aus.edu/cen

