SIU CARBONDALE Southern Illinois University

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Civil Engineering

The School of Civil, Environmental, and Infrastructure Engineering provides educational opportunities that will prepare students for effective and productive careers in Civil Engineering and other related professions. Continued professional growth, discovery, innovation and development of technologies, and service to the community are characteristics of this area of study.

The primary mission of the school is to prepare students for careers that will span forty years or more. Most civil and environmental engineers will be employed by public agencies at all levels of government, by various industries, and by a variety of large and small consulting firms. Virtually all of this practice relates in some way to the health, safety, and welfare of the general public. Those involved in this field will need to possess the ability to conceptualize, plan, design, and construct new and innovative works and systems. Technical knowledge of great sophistication will be needed, as well as an understanding of the interrelated social, political, and environmental issues that will be key elements in the decision making process.

Preparing engineers for this role requires a broad liberal education program as well as one of technical depth and breadth. The undergraduate core curriculum is broad-based and includes courses in mathematics, science, communication, and social science. The civil engineering curriculum begins with fundamental engineering skills and ends with a two-semester capstone design experience. Students are required to take courses in environmental engineering, geotechnical engineering, hydraulic engineering, structural engineering, and surveying.

Program Educational Objectives

The educational goal of the undergraduate civil engineering program is to provide a quality civil engineering education that will prepare our graduates to become practicing professionals able to meet the technological challenges of the 21st century. To this end we strive to instill in our graduates the knowledge, skills, attitudes, and ethical and social values necessary to be successful civil engineering practitioners. Also, we seek to provide the necessary academic background for successful graduate study in engineering or other fields. To meet this goal, we have defined the following objectives that describe what our graduates are expected to attain within three to five years after graduation.

1. Become productive professionals and successfully formulate cost-effective solutions to real-world problems that are fundamental to civil engineering and related fields.
2. Successfully pursue advanced degrees, professional licensure and professional development activities that support life-long learning.
3. Successfully serve the public and improve the quality of life by acting in a professional, safe, and ethical manner.
4. Advance towards leadership positions through effective contribution to multidisciplinary teams.

The program is designed to provide the students with the broad educational background essential to civil engineering practice with emphases in the areas of environmental engineering, geotechnical engineering, hydraulic engineering, and structural engineering. Students may choose to specialize in the area of Environmental Engineering. The program offers sufficient number of courses in the structural engineering area to qualify for structural engineer (SE) license exam.

The School of Civil, Environmental, and Infrastructure Engineering offers a program leading to a Bachelor of Science degree in Civil Engineering. Students may choose to earn a Bachelor of Science degree in Civil Engineering with specialization in Environmental Engineering.

The undergraduate program in civil engineering is accredited by the Engineering Accreditation Commission of ABET, abet.org.

Bachelor of Science (B.S.) in Civil Engineering

Students are required to complete all pre-requisites before they are allowed to take a course. Courses listed as co-requisites or “completion of or concurrent enrollment” can be taken together with the course however, these courses must be completed before or in that semester in order to enroll in the next level course.

B.S. Civil Engineering Degree Requirements

Degree Requirements	Credit Hours	
University Core Curriculum Requirements [1]		39
Foundation Skills	13	
UNIV 101 [2]	1	
ENGL 101, ENGL 102	6	
MATH 150	3	
CMST 101	3	
Disciplinary Studies	23	
Fine Arts	3	
Human Health (BIOL 202 or an approved substitute)	2	
Humanities [3]	6	
Science (see required PHYS and CHEM in major)	6	
Social Science	3	
ECON 240	3	
Integrative Studies	3	
Multicultural	3	
Requirements for Major in Civil Engineering		(11)+88
Basic Sciences	(8)+9	

Degree Requirements		Credit Hours
Human Health (BIOL 202 or an approved substitute)	(2)	
CHEM 200, CHEM 201, CHEM 210	(3)+4	
PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B	(3)+5	
Mathematics		(3)+14
MATH 150, MATH 250, MATH 251, MATH 305	(3)+11	
ENGR 351	3	
Required Engineering Courses: ENGR 250, ENGR 261, ENGR 350A, ENGR 370A		12
Required CE Courses: CE 251, CE 263, CE 301, CE 310, CE 310L, CE 320, CE 320L, CE 330, CE 340, CE 418, CE 421, CE 442, CE 444, CE 474, CE 495A, CE 495B [4]		41
Technical Elective: [5]		12
Total [6]		127

[1] Courses required for the major will apply toward nine hours of University Core Curriculum, making a total of 39 in that area. Number of UCC credit hours required for transfer students admitted under capstone option may be less than 39.

[2] Required only for students who have completed less than 12 credit hours after high school graduation.

[3] School requirements for University Core Curriculum are more restrictive than those of the University as a whole. Students should consult advisor for approved courses. Students transferring from other programs or institutions will be required to meet the University Core Curriculum requirements for engineering students.

[4] CE 495A and CE 495B must be completed at SIU Carbondale. In addition, all required 400-level Civil Engineering courses and at least 2 technical electives must be completed at SIU Carbondale, unless approved by the Director of the School of CEIE.

[5] Approved technical electives: CE 331 and CE 400-level courses.

[6] Total number of credit hours required for graduation may be different for transfer students. However, all students are required to complete all major specific math, science, and engineering courses.

Environmental Engineering Specialization

Students are required to complete all pre-requisites before they are allowed to take a course. Courses listed as co-requisites or “completion of or concurrent enrollment” can be taken together with the course however, these courses must be completed before or in that semester in order to enroll in the next level course.

B.S Civil Engineering - Environmental Engineering Specialization Degree Requirements

Degree Requirements		Credit Hours
University Core Curriculum Requirements [1]		39
Foundation Skills		13
UNIV 101 [2]	1	
ENGL 101, ENGL 102	6	
MATH 150	3	
CMST 101	3	
Disciplinary Studies		23
Fine Arts	3	
Human Health (BIOL 202 or an approved substitute)	2	
Humanities [3]	6	
Science (see required PHYS and CHEM in major)	6	
Social Science	6	
ECON 240	3	
Integrative Studies		3
Multicultural	3	
Requirements for Major in Civil Engineering		(11)+88
Basic Sciences		(8)+9
Human Health (BIOL 202 or an approved substitute)	(2)	
CHEM 200, CHEM 201, CHEM 210	(3)+4	
PHYS 205A, PHYS 205B, PHYS 255A, PHYS 255B	(3)+5	
Mathematics		(3)+14
MATH 150, MATH 250, MATH 251, MATH 305	(3)+11	

Degree Requirements	Credit Hours
ENGR 351	3
Required Engineering Courses: ENGR 250, ENGR 261, ENGR 350A, ENGR 370A	12
Required CE Courses: CE 251, CE 263, CE 301, CE 310, CE 310L, CE 320, CE 320L, CE 330, CE 340, CE 418, CE 421, CE 442, CE 444, CE 474, CE 495A, CE 495B [4]	41
Technical Elective [5]	12
Total [6]	127

[1] Courses required for the major will apply toward nine hours of University Core Curriculum, making a total of 39 in that area. Number of UCC credit hours required for transfer students admitted under capstone option may be less than 39.

[2] Required only for students who have completed less than 12 credit hours after high school graduation.

[3] School requirements for University Core Curriculum are more restrictive than those of the University as a whole. Students should consult advisor for approved courses. Students transferring from other programs or institutions will be required to meet the University Core Curriculum requirements for engineering students.

[4] CE 495A and CE 495B must be completed at SIU Carbondale. In addition, all required 400-level Civil Engineering courses and at least 2 technical electives must be completed at SIU Carbondale, unless approved by the Director of the School of CEIE.

[5] Approved technical electives: CE 410, CE 412, CE 413, CE 416, CE 419, CE 422, CE 471, CE 472, CE 473, and ME 416.

[6] Total number of credit hours required for graduation may be different for transfer students. However, all students are required to complete all major specific math, science, and engineering courses.

Capstone Option for Transfer Students

The SIU Capstone Option is available to students who have earned an Associate in Engineering Sciences (A.E.S.) degree with a minimum cumulative 2.0/4.0 GPA on all accredited coursework prior to the completion of the A.E.S., as calculated by the transfer institution's grading policies. The Capstone Option reduces the University Core Curriculum requirements from 39 to 30 hours, therefore reducing the time to degree completion. Students interested in the Capstone Option should contact the School of Civil, Environmental and Infrastructure Engineering Advisement Office to develop a personal coursework pathway to degree completion.

Technical Enhancement Program

The objective of the Technical Enhancement Program (TEP) is to encourage students to enhance their technical and soft skills, thus improving their marketability upon graduation. This program is available to freshmen only. Students must fulfill the requirements of the program in order to receive a certificate of completion from the School. The School of Civil, Environmental and Infrastructure Engineering has developed this program in collaboration with its Professional Advisory Board. For additional details and how to participate, please contact the School or visit the School website at engineering.siu.edu/civil.

Civil Engineering Courses

CE251 - Introduction to Probability and Statistics for Engineering An introduction to probability and statistics, with emphasis on engineering applications. Univariate and bivariate statistics, simple linear regression, examination of regression residuals, measurement errors, uncertainty propagation, axioms of probability, independence of events, conditional probability and Bayes' rule. Prerequisite: MATH 150 or MATH 151 with a grade of C or better. Credit Hours: 1

CE263 - Basic Surveying An introductory course designed to introduce the principles, theory and equipment of surveying. Development of survey field practices on the earth's surface and subsurface and related computations. Prerequisite: completion of or concurrent enrollment in MATH 150 or MATH 151. Credit Hours: 3

CE301 - Introduction to Resource Sustainability in Civil and Environmental Engineering An introduction to sustainable use of resources, economics of sustainable design, life cycle assessment, consideration of sustainability in various civil engineering applications, case studies on resource sustainability. Prerequisite: ECON 240. Credit Hours: 2

CE310 - Environmental Engineering Basic engineering aspects of water, land, and air pollution and control. Problems, sources, and effects of pollution. Major state and federal regulations relating to environmental issues. Prerequisites: MATH 250 with a grade of C or better; CHEM 210; completion of or concurrent enrollment in CE 251; and concurrent enrollment in CE 310L. Credit Hours: 3

CE310L - Environmental Engineering Laboratory Experiments Prerequisite: MATH 250 with a grade of C or better; CHEM 210; completion of or concurrent enrollment in CE 251; concurrent enrollment in CE 310. If CE 310 is dropped CE 310L must also be dropped. Lab fee: $30. Credit Hours: 1

CE320 - Soil Mechanics Physical and mechanical properties of soils, soil classification, flow through soils, effective stresses, geostatic stress and stresses due to applied loads, one-dimensional consolidation, introduction to shear strength, and soil compaction. Prerequisite: ENGR 350A or ENGR 350C; completion of or concurrent enrollment in CE 251; concurrent enrollment in CE 320L. Credit Hours: 3

CE320L - Soil Mechanics Laboratory Experiments Prerequisites: ENGR 350A or ENGR 350C; completion of or concurrent enrollment in CE 251; concurrent enrollment in CE 320. If CE 320 is dropped CE 320L must also be dropped. Lab fee: $30. Credit Hours: 1

CE330 - Civil Engineering Materials Introduction of cements and aggregates; production and evaluation of concrete structures; mechanical properties of steels and timber, mixing and evaluation of pavement materials; testing of asphalt and masonry. Prerequisite: CE 251, ENGR 350A or ENGR 350C. Lab fee: $30. Credit Hours: 3

CE331 - Transportation Engineering Introduction to geometric design, earth work, drainage and traffic. Basic design principles for each area and their application to typical problems. Prerequisite: completion of or concurrent enrollment in CE 330. Credit Hours: 3

CE340 - Structures Loads. Types of structures. Structural materials. Safety. Analysis of statically determinate beams, trusses, and frames under static loads. Influence lines. Moving loads, Cables, Arches, Space trusses, Deflection of beams, trusses, and frames. Moment distribution for beams. Prerequisite: ENGR 350A or ENGR 350C. Credit Hours: 3

CE392 - Civil Engineering Cooperative Education Supervised work experience in industry, government or professional organization. Students work with on-site supervisor and faculty adviser. Reports are required from the student and the employer. Hours do not count toward degree requirements. Mandatory Pass/Fail. Restricted to sophomore standing. Credit Hours: 1-6

CE410 - Hazardous Waste Engineering Analysis of hazardous waste generation, storage, shipping, treatment, and disposal. Source reduction methods. Government regulations. Remedial action. Prerequisite: CE 310. Credit Hours: 3

CE412 - Contaminant Fate, Transport and Remediation in Groundwater Mathematics of flow and mass transport in the saturated and vadose zones; retardation and attenuation of dissolved solutes; flow of nonaqueous phase liquids; review of groundwater remediation technologies; review of flow and transport models. Prerequisite: CE 310 and CE 320, or consent of instructor for non CE majors. Credit Hours: 3

CE413 - Collection Systems Design Design of waste water and storm water collection systems including installation of buried pipes. Determination of design loads and flows, system layout and pipe size. Prerequisite: CE 310 and ENGR 370A or ENGR 370C. Credit Hours: 3

CE416 - Surface Water Quality Modeling Quantification of physical, biological, and chemical processes occurring in natural freshwater ecosystems. Mathematical analysis of the effects due to conservative and non-conservative pollutant loadings to lakes and rivers. Detailed study of dissolved oxygen mass balance modeling and eutrophication. Prerequisite: CE 310; completion of or concurrent enrollment in CE 418 or GEOL 416 or GEOL 418. Credit Hours: 3

CE418 - Water and Wastewater Treatment A study of the theory and design of water and wastewater treatment systems, including physical, chemical, and biological processes. Topics include sedimentation, biological treatment, hardness removal, filtration, chlorination and residuals management. Prerequisite: CE 310, ENGR 370A or ENGR 370C, and completion of or concurrent enrollment in ENGR 351. Credit Hours: 3

CE419 - Advanced Water and Wastewater Treatment Advanced concepts in the analysis and design of water and wastewater treatment plants. Topics include advanced physical, chemical, and biological processes. Emphasis is on the treatment and disposal of sludges, design of facilities, advanced treatment principles, and toxics removal. Prerequisite: CE 418 and ENGR 351. Credit Hours: 3

CE421 - Foundation Design Application of soil mechanics to the design of the foundations of structures; subsurface exploration; bearing capacity and settlement analysis of shallow foundations; lateral earth pressures and design of retaining walls; capacity and settlement of pile foundations for vertical axial loads. Prerequisite: CE 320. Credit Hours: 3

CE422 - Environmental Geotechnology Geotechnical aspects of land disposal of solid waste and remediation, solute transport in saturated soils, waste characterization and soil-waste interaction, engineering properties of municipal wastes, construction quality control of liners, slope stability and settlement considerations, use of geosynthetics and geotextiles, cap design, gas generation, migration and management. Prerequisite: CE 310, 320. Credit Hours: 3

CE423 - Geotechnical Engineering in Professional Practice Application of principles of geotechnical engineering in a real-world setting; planning, managing and executing geotechnical projects; developing proposals and geotechnical project reports; interpreting and using recommendations developed by geotechnical engineers; total quality management, professional liability and risk management. Prerequisite: CE 320, completion of or concurrent enrollment in CE 421 or consent of instructor for graduate students. Credit Hours: 3

CE426 - Seepage and Slope Stability Analysis Seepage through soils; numerical and physical modeling of two-dimensional flow; basic mechanism of slope stability analysis; analytical methods in analyzing slopes; slope stabilization. Prerequisite: CE 320. Credit Hours: 3

CE431 - Pavement Design Design of highway pavements including subgrades, subbases, and bases; soil stabilization; stresses in pavements; design of flexible and rigid pavements; cost analysis and pavement selection; and pavement evaluation and rehabilitation. Prerequisite: CE 320 and 330. Credit Hours: 3

CE432 - Computer Aided Design and Drawing (CADD) for Civil Engineers A study of civil engineering drawings and their relationship to engineering design in the CADD environment. Emphasis is on the skills associated with developing and understanding technical drawings, including construction plans and related documents, for engineering design. Computer based design and drawing techniques and related software. Includes 3 hours lab per week. Prerequisite: Completion of or concurrent enrollment in CE 263. Credit Hours: 3

CE440 - Statically Indeterminate Structures Analysis of trusses, beams, and frames. Approximate methods. Method of consistent deformations. Three-moment theorem. Slope deflection. Moment distribution. Column analogy. Plastic analysis. Matrix methods. Prerequisite: CE 340. Credit Hours: 3

CE441 - Matrix Methods of Structural Analysis Flexibility method and stiffness method applied to framed structures. Introduction to finite elements. Prerequisite: CE 340. Credit Hours: 3

CE442 - Structural Steel Design An introduction to structural steel design with an emphasis on buildings. Design of structural members and typical welded and bolted connections in accordance with the specifications of the Steel Construction Manual of the American Institute of Steel Construction (AISC). Design project and report required. Prerequisite: CE 340. Credit Hours: 3

CE444 - Reinforced Concrete Design Behavior and strength design of reinforced concrete beams, slabs, compression members, and footings. Prerequisite: CE 340. Credit Hours: 3

CE445 - Fundamental Theory of Earthquake Engineering The nature and mechanics of earthquakes. Plate tectonics, types of faulting, recording and measuring ground motion. Analysis of free and forced vibration of a single degree of freedom system. Steady state and transient response. Impulse response function. Dynamic amplification and resonance. Response to ground motion. Response spectrum analysis. Prerequisite: CE 320 and CE 340, or consent of instructor for graduate students. Credit Hours: 3

CE446 - Prestressed Concrete Design Fundamental concepts of analysis and design. Materials. Flexure, shear, and torsions. Deflections. Prestress losses. Composite beams. Indeterminate structures. Slabs. Bridges. Prerequisite: Completion of or concurrent enrollment in CE 444 or consent of the instructor for graduate students. Credit Hours: 3

CE447 - Seismic Design of Structures Basic seismology, earthquake characteristics and effects of earthquakes on structures, vibration and diaphragm theories, seismic provisions of the International Building Code, general structural design and seismic resistant concrete and steel structures. Prerequisite: CE 442 or CE 444, or consent of instructor for graduate students. Credit Hours: 3

CE448 - Structural Design of Highway Bridges Structural design of highway bridges in accordance with the specifications of the American Association of State Highway and Transportation Officials (AASHTO); superstructure includes concrete decks, steel girders, prestressed and post-tensioned concrete girders; substructure includes abutments, wingwalls, piers, and footings. Prerequisite: CE 442 or CE 444, or consent of instructor for graduate students. Credit Hours: 3

CE451 - Introduction to Finite Elements in Engineering Applications An introduction to finite element techniques and computer methods in finite element applications. Theory and structure of algorithms for one-dimensional and multi-dimensional problems. Applications in solid mechanics, structural analysis, groundwater and fluid flow, and heat transfer. Prerequisite: ENGR 351. Credit Hours: 3

CE466 - GIS in Civil, Environmental and Infrastructure Engineering An introduction to fundamental principles of geographic information systems (GIS) as they apply to Civil, Environmental and Infrastructure Engineering. Spatial data acquisition, mapping of civil and land features, terrain analysis, map projections, and visualization of spatial data. Application of a leading GIS software in the creation of GIS spatial data bases to address problems in hydrology, environmental control, landfill site selection, land development and transportation with an emphasis on engineering design. Methods of spatial interpolation, develop spatial patterns for environmental data and estimate the values at an unsampled location. Prerequisites: CE 251, completion of or concurrent enrollment in ENGR 351. Credit Hours: 3

CE471 - Groundwater Hydrology Analysis of groundwater flow and the transport of pollution by subsurface flow; applications to the design of production wells and remediation of polluted areas; finite difference methods for subsurface analyses. Prerequisite: ENGR 370A or ENGR 370C or consent of instructor for graduate students. Credit Hours: 3

CE472 - Open Channel Hydraulics Open channel flow, energy and momentum, design of channels, gradually varied flow computations, practical problems, spatially varied flow, rapidly varied flow, unsteady flow, flood routing, method of characteristics. Prerequisite: CE 474 or consent of instructor for graduate students. Credit Hours: 3

CE473 - Hydrologic Analysis and Design Hydrological cycle, stream-flow analysis, hydrograph generation, frequency analysis, flood routing, watershed analysis, urban hydrology, flood plain analysis. Application of hydrology to the design of small dams, spillways, drainage systems. Prerequisite: ENGR 370A or ENGR 370C or consent of instructor for graduate students. Credit Hours: 3

CE474 - Water Resources Engineering Hydrological Cycle, Flow Estimation, Study of pipe flow, network systems, pump selection, open channel flow, uniform flow, critical flow, gradually varied flow, rapidly varied flow, Introduction to HEC-RAS, design of transitions, water surface profiles. Prerequisite: ENGR 370A or ENGR 370C or consent of instructor for graduate students. Credit Hours: 3

CE486 - Nondestructive Evaluation of Engineering Materials (Same as ME 486) Overview of common nondestructive evaluation (NDE) techniques, such as visual inspection, eddy current, X-ray, and ultrasonics, to measure physical characteristics of and to detect defects in engineering materials. Laboratory experiments include contact ultrasonic, magnetic particle, liquid penetrant, and infrared thermography methods of testing. Prerequisites: CE 320 and CE 330 with grades of C or better. Credit Hours: 3

CE492A - Special Problems in Civil Engineering Selected engineering topics or problems in structural engineering. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and school director. Credit Hours: 1-4

CE492B - Special Problems in Civil Engineering Selected engineering topics or problems in hydraulic engineering. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and the school director. Credit Hours: 1-4

CE492C - Special Problems in Civil Engineering Selected engineering topics or problems in environmental engineering. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and the school director. Credit Hours: 1-4

CE492D - Special Problems in Civil Engineering Selected engineering topics or problems in applied mechanics. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and the school director. Credit Hours: 1-4

CE492E - Special Problems in Civil Engineering Selected engineering topics or problems in geotechnical engineering. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and the school director. Credit Hours: 1-4

CE492F - Special Problems in Civil Engineering Selected engineering topics or problems in computational mechanics. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and the school director. Credit Hours: 1-4

CE492G - Special Problems in Civil Engineering Selected engineering topics or problems in surveying engineering. Four hours maximum credit. Not for graduate credit. Special approval needed from the instructor and the school director. Credit Hours: 1-4

CE495A - Civil Engineering Design Engineering ethics and professionalism. Project development skills, feasibility and cost-estimation, project management, auto-cad applications in civil engineering. Selection of projects, formation of design teams, development of a design proposal. Written and oral presentations of the design proposal. Not for graduate credit. Prerequisite: PHYS 205B and PHYS 255B, completion of/ concurrent enrollment in CE 301, CE 320, CE 330, CE 442 or CE 444, and CE 474. Credit Hours: 3

CE495B - Civil Engineering Design A capstone design experience using a team approach for the preliminary and final design of a civil engineering project. Documentation of all stages of the design project. Written and oral presentation of the final design. Not for graduate credit. Prerequisite: CE 495A with a grade of C or better, CE 301, CE 320, CE 330, CE 442 or CE 444, CE 474, completion of or concurrent enrollment in CE 418, CE 421 and CE 442 or 444. Credit Hours: 3

Civil Engineering Faculty

Chevalier, Lizette R., Professor and Associate Provost for Academic Programs, Civil Engineering, Ph.D., Michigan State University, 1994; 1995. Environmental restoration of groundwater aquifers, experimental investigation of immiscible flow, and numerical modeling of subsurface transport.

Fakhraei, Habibollah, Assistant Professor, Civil Engineering, Ph.D., Syracuse University, 2016; 2019. Environmental engineering, environmental modeling, biogeochemistry, aquatic chemistry, water quality modeling, air pollution effects, GIS, geostatistical analysis, hydrology, numerical optimization.

Kalra, Ajay, Assistant Professor, Civil Engineering, Ph.D., University of Nevada, 2011; 2015. Hydraulics and water resources engineering, hydro-climatology, urban sustainability, water-energy-climate nexus, probabilistic forecasting and downscaling, surface water and groundwater interactions.

Kolay, Prabir, Associate Professor, Civil Engineering, Ph. D., Indian Institute of Technology, IIT Bombay, 2001; 2010. Geotechnical engineering, soil stabilization, utilization of recycled concrete aggregate (RCA) and coal ash, unsaturated soil, thermal properties of soil, and numerical modeling.

Kumar, Sanjeev, Professor, Distinguished Teacher, Director, Civil Engineering, Ph.D., University of Missouri Rolla, 1996; 1998. Dynamic soil-structure interaction, piles under lateral loads, settlement prediction of landfills, hydraulic conductivity of clay barriers, seismic analysis and design of landfills, ground motion amplification in soils, liquefaction of silts and sands and machine foundations.

Liu, Jia, Associate Professor, Civil Engineering, Ph.D., University of Houston, 2014; 2015. Environmental engineering, renewable energy production, microbial fuel cell, water/wastewater treatment and groundwater/soil remediation, material development for energy safety and environmental pollution detection.

Puri, Vijay K., Professor, Civil Engineering, Ph.D., University of Missouri-Rolla, 1984; 1986. Geotechnical engineering, soil dynamics, machine foundations, liquefaction of soils.

Shams, Mehnaz, Assistant Professor, Civil Engineering, Ph.D., Washington State University, 2019; 2020. Environmental engineering, fate and transport of emerging pollutants in surface water, plastic pollution and prevention, water/wastewater treatment, environmental chemistry, storm water management, electrochemical remediation.

Shin, Sangmin, Assistant Professor, Civil Engineering, Ph.D., Korea Advanced Institute of Science and Technology (KAIST), 2015; 2021. Integrated water resources modeling and management, critical interdependent infrastructure systems, socio-enviromental hydrology, cyber-physical systems, urban sustainability and resilience, water-energy-food nexus, multi-objective optimization and decision making, real-time system control, systems thinking and analysis.

Tezcan, Jale, Professor, Civil Engineering, Ph.D., Rice University, 2005; 2005. Non-linear structural behavior, neural networks in system identification and structural control, rehabilitation, and retrofitting of structures damaged by earthquakes.

Warwick, John J., Professor, Civil Engineering, Ph.D., The Pennsylvania State University, 1983; 2011. Numerical modeling of the transport and fate of contaminants in surface water systems, impacts of nutrients on stream algal growth, transport of sediment and associated mercury in fluvial systems, and simulating the effects of non-point source pollutants on instream water quality.

Emeriti Faculty

Bravo, Rolando, Associate Professor, Emeritus, Civil Engineering, Ph.D., University of Houston, 1990; 1991.

Butson, Gary J., Associate Professor, Emeritus, Civil Engineering, Ph.D., University of Illinois at Urbana-Champaign, 1981;1992.

Cook, Echol E., Professor, Emeritus, Civil Engineering, Ph.D., Oklahoma State University, 1970; 1971.

DeVantier, Bruce A., Associate Professor, Emeritus, Civil Engineering, Ph.D., University of California-Davis, 1983; 1983.

Evers, James L., Associate Professor, Emeritus, Civil Engineering, Ph.D., University of Alabama, 1969; 1969.

Frank, Roy R., Jr., Assistant Professor, Emeritus, Civil Engineering, M.S., Southern Illinois University Carbondale, 1983; 1984.

Hsiao, J. Kent, Professor, Civil Engineering, Ph.D., University of Utah — Salt Lake City, 2000; 2001.

Kassimali, Aslam, Professor and Distinguished Teacher, Civil Engineering, Ph.D., University of Missouri, 1976; 1980.

Ray, Bill T., Associate Professor, Emeritus, Civil Engineering, Ph.D., University of Missouri-Rolla, 1984; 1985.

Rubayi, Najim, Professor, Emeritus, Civil Engineering, Ph.D., University of Wisconsin, 1966; 1966.

Sami, Sedat, Professor, Emeritus, Civil Engineering, Ph.D., University of Iowa, 1966; 1966.

Yen, Max Shing-Chung, Professor, Emeritus, Civil Engineering, Ph.D., Virginia Polytechnic Institute, 1984; 1984.

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Catalog Year Statement:
Students starting their collegiate training during the period of time covered by this catalog (see bottom of this page) are subject to the curricular requirements as specified herein. The requirements herein will extend for a seven calendar-year period from the date of entry for baccalaureate programs and three years for associate programs. Should the University change the course requirements contained herein subsequently, students are assured that necessary adjustments will be made so that no additional time is required of them.