

Civil Engineering (CVEG)

Micah Hale
Head of the Department
4190 Bell Engineering Center
479-575-4954

Department of Civil Engineering Website (<https://civil-engineering.uark.edu/>)

Civil engineering is the oldest of all engineering fields, yet it is as contemporary as the need to provide solutions to today's environmental, geotechnical, structural and transportation problems. The civil engineer plans, designs, builds, and operates projects for the advancement and well-being of society while coordinating and conserving human and natural resources. Civil engineering projects range from small to monumental and include public water systems, buildings, bridges, rail and highway networks, water and wastewater treatment plants, solid and hazardous waste disposal facilities, airports, and soil conservation and flood diversion controls.

The civil engineering profession offers a vast array of opportunities. Civil engineers may work in private employment or with public agencies. They may work indoors in activities such as planning and design, or outdoors in areas such as construction supervision. Employment is possible anywhere in the world.

The objective of the Civil Engineering undergraduate program is to produce graduates who are prepared to pursue:

- Careers in the broad field of civil engineering
- Licensure as a professional engineer
- Advanced education

To fulfill this objective, all students must take courses in geotechnical, environmental, transportation, and structural engineering. Courses are designed to present "real world" applications without sacrificing conceptual and theoretical basics. Students complete design problems in each of these areas; and, as part of the senior year, they participate in two major design projects.

Completion of degree requirements provides graduates with the following learning outcomes:

- 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.

Requirements for B.S. in Civil Engineering Elective Courses

Students must select three 3-hour civil engineering elective courses in conference with their adviser. Normally, the civil engineering courses are selected from among the 4000-level elective CVEG courses. Exceptional students may be allowed to choose from the 5000 (graduate-level) course series.

Students must also choose one elective course in science, engineering, technology, or math (STEM) field.

Humanities and social science electives are selected from courses approved by the university which satisfy the University General Education Curriculum and the Arkansas State Minimum Core requirements.

Students are required to complete 40 hours of upper division courses (3000-4000 level). It is recommended that students consult with their adviser when making course selections.

Civil Engineering Design Electives

Students must complete two of the following four CVEG design project electives: CVEG 48102 Environmental Design Project, CVEG 48202 Geotechnical Design Project, CVEG 48302 Structural Design Project, and CVEG 48402 Transportation Design Project. Each design project elective is associated with a specific design-oriented course. The associated course must be taken at the same time as the design project elective. The associated courses may be taken alone but the design electives cannot.

STEM Electives

Students must also choose one elective course in science, engineering, technology, or math (STEM) from among the following:

CSCE 20004	Programming Foundations I	4
ELEG 39003	Electric Circuits and Machines	3
GNEG 31103	Special Topics-Study Abroad	3
GNEG 38101	Alternating Cooperative Education (must get 3 separate rotations)	1
MEEG 20103	Dynamics	3
MEEG 24003	Thermodynamics	3
MEEG 27003	Computer Methods in Mechanical Engineering	3
GEOS 30203	Introduction to Cartography	3
GEOS 35403	Geospatial Applications and Information Science	3
GEOS 45303	Introduction to Petroleum Geophysics	3
MATH 30803	Linear Algebra	3
MATH 43603	Numerical Analysis	3

Any 3000-level or above science, technology, engineering or math course. (It is recommended that students consult with their adviser when making this selection.)

Civil Engineering B.S.C.E. Eight-Semester Degree Program

The Civil Engineering B.S.C.E. program is eligible for freshman students who want to participate in an Eight-Semester Degree Program. See the Eight-Semester Degree Policy (<http://catalog.uark.edu/undergraduatecatalog/academicregulations/eightsemesterdegreecompletionpolicy/>) for details of the program.

The following section contains the list of courses required for the Bachelor of Science in Civil Engineering degree and a suggested sequence. Not all courses are offered every semester, so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

See the list of state minimum core (<http://catalog.uark.edu/undergraduatecatalog/gened/stateminimum/>) courses available for engineering students.

First Year	Units	
	Fall	Spring
MATH 24004 Calculus I (ACTS Equivalency = MATH 2405) (Satisfies General Education Outcome 2.1) ¹	4	
GNEG 11101 Introduction to Engineering I Satisfies General Education Outcome 3.4:	1	
GEOL 11103 Physical Geology (ACTS Equivalency = GEOL 1114 Lecture) & GEOL 11101 Physical Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)	4	
GEOL 11101 Physical Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)	1	
CHEM 14103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)	3	
ENGL 10103 Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome 1.1)	3	
MATH 25004 Calculus II		4
GNEG 11201 Introduction to Engineering II		1
ENGL 10303 Technical Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.2)		3
Select one of the following to satisfy General Education Outcome 4.2:		3
PLSC 20003 American National Government (ACTS Equivalency = PLSC 2003)		
HIST 20003 History of the American People to 1877 (ACTS Equivalency = HIST 2113)		
HIST 20103 History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)		
Satisfies General Education Outcome 3.4:		
PHYS 20304 University Physics I (ACTS Equivalency = PHYS 2034)		4
Year Total:	16	15

Second Year	Units	
	Fall	Spring
MATH 26004 Calculus III	4	
CVEG 20103 Civil Engineering Mechanics I	3	
CVEG 20002 Introduction to Civil Engineering Plans and CADD	2	
CVEG 20503 Surveying Systems & CVEG 20501 Surveying Systems Laboratory	4	
Fine Arts Elective (Select a course to satisfy General Education Outcome 3.1) ²	3	
MATH 25804 Elementary Differential Equations		4
CVEG 20203 Civil Engineering Mechanics II		3
CVEG 21103 Structural Materials		3
INEG 33103 Engineering Probability and Statistics Science Elective ⁷		3
		4
Year Total:	16	17

Third Year	Units	
	Fall	Spring
INEG 24103 Engineering Economic Analysis	3	
CVEG 33003 Structural Analysis	3	
CVEG 32103 Hydraulics	3	
STEM Elective	3	
CVEG 34103 Transportation Systems Engineering	3	
CVEG 28501 Engineering Professional Practice Issues	1	
CVEG 43003 Reinforced Concrete Design I		3
CVEG 32403 Environmental Engineering		3
CVEG 31302 Soil Mechanics & CVEG 31301 Soil Mechanics Laboratory		3
CVEG 32203 Hydrology		3
Social Sciences Elective (select one course to satisfy General Education Outcomes 3.3 and 4.1) ³		3
Year Total:	16	15

Fourth Year	Units	
	Fall	Spring
Civil Engineering Elective ⁴	3	
Civil Engineering Design Elective (Satisfies General Education Outcome 6.1)	2	
CVEG 41403 Foundation Engineering	3	
CVEG 44203 Transportation Infrastructure CVEG 48900	3	0
Humanities Elective (select one course to satisfy General Education Outcomes 3.2 and 5.1) ⁵	3	
Social Sciences Elective (select one course to satisfy General Education Outcome 3.3) ⁶	3	
CVEG 45103 Construction Management		3
Civil Engineering Design Elective (Satisfies General Education Outcome 6.1)		2
CVEG 42403 Environmental Engineering Design Civil Engineering Electives ⁴		3
		6
Social Sciences Elective (select one course to satisfy General Education Outcome 3.3) ⁶		3

Year Total: 17 17

Total Units in Sequence: 129

- ¹ Students have demonstrated successful completion of the learning indicators identified for learning outcome 2.1, by meeting the prerequisites for MATH 24004.
- ² The Fine Arts Elective courses which satisfy General Education Outcome 3.1 include: ARCH 10003, ARHS 10003, COMM 10003, DANC 10003, LARC 10003, MUSC 10003, MUSC 100H3, MUSC 10103, MUSC 101H3, MUSC 13303, THTR 10003, THTR 10103, or THTR 101H3.
- ³ The Social Sciences Elective courses which satisfy General Education Outcomes 3.3 and 4.1 include: ANTH 10203, COMM 10203, HDFS 14003, HDFS 24103, HIST 11193, HIST 11293, HIST 20903, HUMN 111H4, HUMN 211H4, INST 28103, INST 281H3, PLSC 20103, PLSC 28103, PLSC 281H3, RESM 28503, SOCI 10103, SOCI 201H3, or SOCI 20103.
- ⁴ See the elective list among the program requirements.
- ⁵ The Humanities Elective courses which satisfy General Education Outcomes 3.2 and 5.1 include: CLST 10003, CLST 100H3, CLST 10103, HUMN 112H4, PHIL 20003, PHIL 200H3, PHIL 21003.
- ⁶ The Social Sciences Elective courses which satisfy General Education Outcome 3.3 include: AGEC 11003, AGEC 21003, ANTH 10203, COMM 10203, ECON 21003, ECON 22003, ECON 21403, EDST 20003, HDFS 14003, HDFS 24103, HDFS 26003, HIST 11193, HIST 111H3, HIST 11293, HIST 112H3, HIST 20003, HIST 20103, HIST 20903, HUMN 111H4, HUMN 211H4, INST 28103, INST 281H3, PLSC 20003, PLSC 20103, PLSC 21003, PLSC 28103, PLSC 281H3, PSYC 20003, RESM 28503, SOCI 10103, SOCI 201H3, SOCI 20103. Note, courses cannot be counted twice in degree requirements.
- ⁷ Chose one from the list below:
PHYS 20404, GEOS 35104, BIOL 10103 and BIOL 10101, BIOL 20003 and BIOL 20001, or
CHEM 14203 and CHEM 14201.

Honors Program Requirements

Students enrolled in the Honors College who are to receive the Bachelor of Science in Civil Engineering must complete a minimum of 12 hours of honors credit. At least 6 hours must be completed within the Civil Engineering program including at least 3 hours resulting in an Honors Thesis. The CVEG honors courses are acceptable as engineering electives and in some cases may be substituted for required courses. The following Civil Engineering courses are offered for honors credit: CVEG 491HV Honors Studies in Geotechnical Engineering, CVEG 493HV Honors Studies in Structural Engineering, CVEG 494HV Honors Studies in Transportation Engineering, and CVEG 498H3 Honors Undergraduate Thesis.

Faculty

Bernhardt-Barry, Michelle, Ph.D., M.S.C.E., B.S.C.E. (Texas A&M University), Associate Professor, 2013, 2019.
Braham, Andrew F., Ph.D. (University of Illinois-Urbana-Champaign), M.S., B.S. (University of Wisconsin-Madison), Associate Professor, 2010, 2018.
Clark, Suzanne G., J.D. (University of Arkansas), B.S. (University of Connecticut), B.A. (Fairfield University), Instructor, 2023.
Coffman, Rick, Ph.D. (University of Missouri-Columbia), M.S. (University of Texas at Austin), B.S. (University of Wyoming), Professor, 2009, 2021.

Fairey, Julian, Ph.D., M.S.C.E. (University of Texas at Austin), B.S.C.E. (University of Alberta, Canada), Associate Professor, 2008, 2014.
Fernstrom, Eric, Ph.D. (University of Arkansas), Teaching Assistant Professor, 2014, 2021.
Guo, Lei, Ph.D. (University of California, Berkeley), B.S. (Lanzhou University, China), Assistant Professor, 2022.
Hale, Micah, Ph.D., M.S.C.E., B.S.C.E. (University of Oklahoma), Professor, 21st Century Leadership Chair in Civil Engineering, 2002, 2013.
Hall, Kevin D., Ph.D. (University of Illinois-Urbana-Champaign), M.S.C.E., B.S.C.E. (University of Arkansas), Professor, Walter E. Hicks and Blossom Russel Hicks Professorship for Infrastructure Engineering, 1993, 2002.
Hernandez, Sarah, Ph.D., M.S. (University of California, Irvine), B.S. (University of Florida), Associate Professor, 2015, 2021.
Heymfield, Ernie, Ph.D. (City University of New York), M.S.C.E. (Polytechnic University), Associate Professor, 2001, 2007.
Lee, Seungtaek, Ph.D. (Arizona State University), M.S. (Chung-Ang University), Instructor, 2021.
Lloyd, Larry, M.B.A., B.S.C.E. (University of Arkansas), Instructor, 2020.
Mitra, Suman, Ph.D. (University of California, Irvine), M.S., B.S. (Bangladesh University of Engineering and Technology), Assistant Professor, 2019.
Morrow, Tommy K., Ph.D. (University of Texas at Austin), Instructor, 2019.
Murray, Cameron, Ph.D. (University of Oklahoma), M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, 2017.
Power, Daniel, B.S.M.E., (University of Arkansas), Instructor, 2022.
Prinz, Gary S., Ph.D, M.S., B.S. (Brigham Young University), Associate Professor, 2014, 2019.
Sasidharan, Lekshmi, Ph.D. (Pennsylvania State University), M.S. (National Institute of Technology), B.S. (University of Kerala), Teaching Assistant Professor, 2022.
Selvam, R. Panneer, Ph.D. (Texas Tech University), M.S.C.E. (South Dakota School of Mines and Technology), M.E., B.E. (University of Madras, India), University Professor, James T. Womble Professor of Computational Mechanics and Nanotechnology Modeling, 1986, 2010.
Tayeh, Ralph, Ph.D., M.S. (University of Florida), B.S. (Lebanese American University, Byblos, Lebanon), Instructor, 2021.
Thompson, Graham W., M.S., (New Mexico State University), B.S. (University of Arkansas), Instructor, 2021.
Thompson, Rick, Ph.D., M.S., (Catholic University of America), M.B.A. (Cornell University), M.Arch (New School of Architecture & Design), Instructor, 2021.
Welcher, Richard, M.S.C.E., B.S.C.E. (University of Arkansas), Instructor, 2011.
Williams, Rodney D., Ph.D., M.S., B.S.C.E. (University of Arkansas), Instructor, 1998.
Williams, Stacy Goad, Ph.D., M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, 1997.
Wood, Clinton M., Ph.D. (University of Texas at Austin), M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, 2013, 2019.
Zhang, Wen, Ph.D. (Purdue University), M.S. (University of Kansas), Associate Professor, 2011, 2018.

Adjunct Faculty

Circo, Carl J., J.D., B.A. (University of Nebraska), Professor, School of Law, 2003, 2010.

Courses

CVEG 20002. Introduction to Civil Engineering Plans and CADD. 2 Hours.

Development and preparation of design and construction plans; plan terminology and features; introduction to computer-aided drafting and design (CADD) software. Prerequisite: Civil Engineering major or departmental consent. (Typically offered: Fall, Spring and Summer)

CVEG 20103. Civil Engineering Mechanics I. 3 Hours.

CVEG 20103 provides the student with a foundation in the theory and principles of statics for use in subsequent civil engineering courses. The course applies mathematics and physics to solve practical problems of structural systems. Corequisite: MATH 26004. Prerequisite: MATH 25004 with a C or better and PHYS 20304 with a C or better. (Typically offered: Fall and Spring)

CVEG 20203. Civil Engineering Mechanics II. 3 Hours.

CVEG 20203 provides the student with a foundation in the theory and principles of mechanics of materials for use in subsequent civil engineering courses. This course applies mathematics and physics to solve problems in mechanics. Prerequisite: CVEG 20103 with a C or better or MEEG 20003 with a C or better. (Typically offered: Fall and Spring)

CVEG 20501. Surveying Systems Laboratory. 1 Hour.

Laboratory exercises demonstrating the principles and practices of surveying systems. Corequisite: CVEG 20503. (Typically offered: Fall)

CVEG 20503. Surveying Systems. 3 Hours.

Coordinate geometry, measurements, and total integrated surveying systems; total stations, electronic data collection, and reduction; error analysis; applications to civil engineering and surveying practice. Corequisite: CVEG 20501. Prerequisite: MATH 24004 with a C or better or MATH 24005 with a C or better. (Typically offered: Fall)

CVEG 21103. Structural Materials. 3 Hours.

Production, properties, behavior, and structural applications of concrete, steel, timber, masonry, and plastic. Statistical analysis methods for quality control are also covered. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: MEEG 20003 with a C or better or CVEG 20103 with a C or better. Pre- or Corequisite: MEEG 30103 or CVEG 20203. (Typically offered: Fall and Spring)

CVEG 28501. Engineering Professional Practice Issues. 1 Hour.

Study of various issues related to the professional practice of engineering including ethics, professionalism, professional licensure, project procurement, social and political issues, globalism, and other legal issues. (Typically offered: Fall and Spring)

CVEG 31301. Soil Mechanics Laboratory. 1 Hour.

Index, strength, and consolidation properties of soils; test methods and specifications for soil sampling and testing. Corequisite: CVEG 31302. (Typically offered: Fall and Spring)

CVEG 31302. Soil Mechanics. 2 Hours.

Introduction to geotechnical engineering. Properties of soils related to foundations, retaining walls, earth structures, and highways. Lecture 2 hours, laboratory 3 hours per week. Corequisite: CVEG 31301. Pre- or Corequisite: CVEG 32103 and MATH 25804. Prerequisite: ((MEEG 30103 or CVEG 20203) with a C or better), GEOL 11103 with a C or better, and CVEG 20002 with a C or better. (Typically offered: Fall and Spring)

CVEG 32103. Hydraulics. 3 Hours.

Study of incompressible fluids. Topics include fluid properties, fluid statics, continuity, energy and hydraulic gradients, fundamentals of flow in pipes and open channels, flow measurement devices, pump selection and analysis. Corequisite: Lab component. Prerequisite: CVEG 20103 with a C or better or MEEG 20003 with a C or better. (Typically offered: Fall and Spring)

CVEG 32203. Hydrology. 3 Hours.

Flood routing procedures in storage reservoirs and channels. Hydrologic planning including storage reservoir design, frequency duration analysis, and related techniques. Prerequisite: (CVEG 20503 or BENG 26403) with a C or better, and (CVEG 32103 or MEEG 35003 or CHEG 21303) with a C or better. (Typically offered: Fall and Spring)

CVEG 32403. Environmental Engineering. 3 Hours.

Introduction to theories and fundamentals of physical, chemical, and biological processes with emphasis on water supply and wastewater collection, transportation, and treatment. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: MATH 25804 with a C or better and CHEM 14103 with a C or better. (Typically offered: Fall and Spring)

CVEG 33003. Structural Analysis. 3 Hours.

Truss analysis, influence lines for beams and frames, and effects of moving loads. Deformation of beams, frames, and trusses. Analysis of indeterminate structures by moment area, slope deflection, and moment distribution methods; approximate methods of analysis. Lecture 3 hours, drill 3 hours per week. Corequisite: Drill component. Prerequisite: MEEG 30103 with a C or better or CVEG 20203 with a C or better. (Typically offered: Fall and Spring)

CVEG 34103. Transportation Systems Engineering. 3 Hours.

Transportation Systems Engineering: Introduction to transportation systems engineering and planning. Includes the following topics: transportation governance, financing, and the effect on the environment; traffic flow theory; safety; traffic operations and control; capacity; and travel demand modeling. Prerequisite: CVEG 20503 with a C or better and (INEG 23104 or INEG 33103) with a C or better. (Typically offered: Fall)

CVEG 41403. Foundation Engineering. 3 Hours.

Analysis and design of retaining walls, footings, sheet piles, and piles. Determination of foundation settlements in sand and clay. Prerequisite: CVEG 31302 with a C or better and INEG 24103 with a C or better. (Typically offered: Fall and Spring)

CVEG 42003. Environmental Regulations and Permits. 3 Hours.

Topics include federal and state environmental regulations, the permitting process, permit requirements and related issues. Prerequisite: CVEG 32403 with a C or better and senior standing. (Typically offered: Fall)

CVEG 42403. Environmental Engineering Design. 3 Hours.

Application of physical, biological, and chemical operations and processes to the design of water supply and wastewater treatment systems. Prerequisite: CVEG 32403 with a C or better and INEG 24103 with a C or better. (Typically offered: Spring)

CVEG 42603. Air Pollution Control. 3 Hours.

Fundamentals of air pollution causes, effects, and measurements; as well as, control methods with application to current industrial problems. Prerequisite: CVEG 32103 with a C or better or MEEG 35003 with a C or better. (Typically offered: Spring)

CVEG 42703. Open Channel Flow. 3 Hours.

Open Channel Flow includes advanced open channel hydraulics, flow measurement techniques, a hydrology review, culvert and storm drainage design, natural channel classification (fluvial geomorphology) and rehabilitation, computer methods and environmental issues. Prerequisite: CVEG 32103 and CVEG 32203. (Typically offered: Spring)

CVEG 43003. Reinforced Concrete Design I. 3 Hours.

Design of reinforced concrete elements with emphasis on ultimate strength design supplemented by working stress design for deflection and crack analysis. Prerequisite: CVEG 21103 with a C or better and CVEG 33003 with a C or better. (Typically offered: Fall and Spring)

CVEG 43103. Structural Steel Design I. 3 Hours.

Design of structural steel elements by elastic design the Load and Resistance Factor Design method. Intensive treatment of tension members, beams, columns, and connections. Pre- or Corequisite: CVEG 21103. Prerequisite: CVEG 33003 with a C or better. (Typically offered: Fall and Spring)

CVEG 43203. Structural Loadings. 3 Hours.

Theoretical background to and practical code requirements for various structural loadings. These include dead loads, occupancy loads, roof loads and ponding, snow loads, granular loads, vehicular loads, wind loading, and seismic loads. Prerequisite: CVEG 33003 with a C or better, INEG 24103 with a C or better, and ((CVEG 43003 or CVEG 43103) with a C or better). (Typically offered: Spring)

CVEG 43403. Reinforced Masonry Design. 3 Hours.

Properties of masonry materials and assemblages. Masonry workmanship and quality control. Design of reinforced masonry elements against gravity and lateral loads. Design of masonry connections and joints. Application to 1- and 2-story buildings. Prerequisite: CVEG 43003 with a C or better. (Typically offered: Irregular)

CVEG 43503. Timber Design. 3 Hours.

Selection of timber beams, columns, and beam-columns. Physical properties of wood, analysis and design of timber connections. Truss design, glulam members, timber bridge design, treatment for decay, and fire protection. Pre- or Corequisite: CVEG 21103. Prerequisite: CVEG 33003 with a C or better. (Typically offered: Irregular)

CVEG 44103. Pavement Evaluation and Rehabilitation. 3 Hours.

Introduction of concepts and procedures for pavement condition surveys; evaluation by nondestructive and destructive testing; maintenance strategies; rehabilitation of pavement systems for highway and airfields; pavement management systems. Prerequisite: CVEG 44303 with a C or better. (Typically offered: Irregular)

CVEG 44203. Transportation Infrastructure. 3 Hours.

Transportation infrastructure includes discussion on the geometric design of roadways, roadway drainage, roadway materials, roadway structural design, and an economic analysis of roadways. This includes the design of horizontal and vertical alignment, cross section, intersections, pavement materials, and structural capacity. Prerequisite: CVEG 34103 with a C or better and INEG 24103 with a C or better. (Typically offered: Fall and Spring)

CVEG 44303. Transportation Pavements and Materials. 3 Hours.

Study of the engineering properties and behavior of materials commonly used in transportation facilities as they relate to the design and performance of flexible and rigid pavement systems. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CVEG 31302 with a C or better, CVEG 34103 with a C or better, and ((INEG 23104 or INEG 33103) with a C or better). (Typically offered: Irregular)

CVEG 45103. Construction Management. 3 Hours.

Introduction to methods and procedures for management of civil engineering construction projects including organization, plans and specs, cost estimating and bidding, project planning and finance, quality control/ assurance, construction safety, cost management, labor issues, change orders, and subcontractor issues. Prerequisite: Senior standing and Civil Engineering majors only. (Typically offered: Fall and Spring)

CVEG 48102. Environmental Design Project. 2 Hours.

Comprehensive engineering design project primarily related to environmental issues. Corequisite: CVEG 42403. (Typically offered: Spring)

CVEG 48202. Geotechnical Design Project. 2 Hours.

Comprehensive engineering design project primarily related to geotechnical issues. Corequisite: CVEG 41403. Prerequisite: CVEG 43003 with a C or better. (Typically offered: Fall)

CVEG 48302. Structural Design Project. 2 Hours.

Comprehensive engineering design project primarily related to structural issues. Corequisite: CVEG 43203. Prerequisite: CVEG 43003 with a C or better and CVEG 43103 with a C or better. (Typically offered: Spring)

CVEG 48402. Transportation Design Project. 2 Hours.

Comprehensive engineering design project primarily related to transportation issues. Corequisite: CVEG 44203. Prerequisite: CVEG 20002 with a C or better. (Typically offered: Fall)

CVEG 48603. Sustainability in Civil Engineering. 3 Hours.

Qualify and quantify the economic, environmental, societal, and engineering drivers behind sustainability in Civil Engineering. Justification of the feasibility and benefits of sustainability in environmental, geotechnical, structural, and transportation engineering through verbal and written communications. Prerequisite: Senior standing. (Typically offered: Irregular)

CVEG 4880V. Special Problems. 1-6 Hour.

Special problems. Prerequisite: Senior standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CVEG 491HV. Honors Studies in Geotechnical Engineering. 1-6 Hour.

The study of advanced topics in the geotechnical engineering field. May include participation in geotechnical engineering courses normally available only to graduate students. Prerequisite: CVEG 31302 with a grade of C or better. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CVEG 493HV. Honors Studies in Structural Engineering. 1-6 Hour.

The study of advanced topics in the structural engineering field. May include participation in structural engineering courses normally available only to graduate students. Prerequisite: CVEG 33003 with a grade of C or better. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CVEG 494HV. Honors Studies in Transportation Engineering. 1-6 Hour.

The study of advanced topics in the transportation engineering field. May include participation in transportation engineering courses normally available only to graduate students. Prerequisite: CVEG 34103 with a grade of C or better. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CVEG 498H3. Honors Undergraduate Thesis. 3 Hours.

Thesis research for civil engineering students enrolled in the honors college. Prerequisite: Honors College. (Typically offered: Irregular)