Civil Engineering Undergraduate Courses

CVNG 101 Freshmen Engineering I (1)
An introduction the Civil Engineering profession that consists of a series of project-based learning modules designed to explore various specialty areas within Civil Engineering. Basic drafting skills are also covered. Offered every fall semester.

CVNG 102 Freshmen Engineering II (1)
Introduction to engineering drawing and computer aided drafting techniques. Prerequisite: CVNG 101. Offered every spring semester.

CVNG 150 Civil Engineering Computing (3)
Introduction to computer programming tools applicable to Civil Engineering, including MatLAB/MathCAD, advanced Excel, and 3-D CAD applications. Prerequisite: Math 142; Co-request: CVNG 102. Offered every spring semester.

CVNG 203 Sustainability and Environmental Engineering (3)
Course provides an overview of sustainability and environmental engineering principles. Topics include: population, environmental impact, and resource depletion; environmental laws; biodiversity and ecosystem functioning; climate change, air pollution, and ozone depletion; solid-waste management, hazardous and nuclear waste management; water resource and pollution management; and water and wastewater treatment and systems. Prerequisite: CHEM 163 or CHEM151. Offered every fall semester.

CVNG 204 Sustainability and Environmental Engineering Laboratory (1)
Course provides an overview of environmental testing methods, including dissolved oxygen, BOD, pH and alkalinity, conductivity, plate counts, and turbidity. Prerequisite: CHEM 165. Co-requisite CVNG 203. Offered every fall semester.

CVNG 301 Structural Analysis (3)
Analysis of statically determinate structures including influence lines. Deformations using different techniques. Analysis of statically indeterminate structures using the force method and displacement method. Prerequisite: ESCI 310. Offered every fall semester.

CVNG 302 Structural Analysis Laboratory (1)
Introduction to computational tools used for the analysis of structures. Co-requisite. CVNG 301. Offered every fall semester.

CVNG 303 Civil Engineering Materials (2)
Introduction to the characteristic properties and the fundamental behavior of the materials used by civil engineers with emphasis on concrete, steel, masonry, wood, and asphalt. Laboratory experiments and testing is used to give knowledgeable perception of the behavior when materials are subjected to various loads. Prerequisite: ESCI 310/311. Offered every fall semester.
CVNG 305 Introduction to Surveying (1)

Introduction to surveying equipment, including use of a level, theodolite, and total station; and basic survey data interpretation and analysis. Prerequisite: EAS 217. Offered every fall semester.

CVNG 307 Engineering Project Management (2)

An introduction to basic concepts of management, business, public policy, and leadership. Topics include engineering economics and cost estimating methods, including labor, material, equipment and indirect costs; analytical techniques for project planning and scheduling; legal issues in engineering projects, including zoning regulations, proposals, and contracts; and understanding the importance of professional licensure. Offered every fall semester.

CVNG 309 Geotechnical Engineering (3)

This course is an introduction soil properties and analysis techniques for geotechnical applications. Topics include soil formations, mass-volume relationships, soil classification, effective stress, compaction, seepage, soil deformation, state of stress, consolidation, strength, and failure. Prerequisite: CVNG 303. Offered every spring semester.

CVNG 309 Geotechnical Engineering Laboratory (1)

Overview and use of measurement methods that can evaluate the properties of soils. Experiments include grain size distribution and soil classification, Atterberg Limits, compaction, permeability, consolidation, shear strength, and unconfined compressive strength. Co-requisite CVNG 309. Offered every spring semester.

CVNG 311 Transportation Engineering (3)

Introduction to transportation analysis and design. Course includes topics on road user and vehicle characteristics; geometric design of roadways, including horizontal and vertical alignment and cross-sectional elements; and signalized intersections. Also included is an Introduction to traffic engineering and transportation planning. Prerequisite: MATH 403. Offered every spring semester.

CVNG 312 Transportation Engineering Laboratory (1)

Overview and use of measurement methods that can evaluate traffic flow and pavement condition and an introduction to computational methods used in transportation analysis and design. Co-requisite: CVNG 311. Offered every spring semester.

CVNG 313 Hydraulic Engineering (3)

Hydraulic and hydrological analysis applicable to civil engineering design. Topics include pressure pipe system analysis and design, open channel flow analysis and design, groundwater flow fundamentals and well design, hydrologic processes, stormwater system analysis and design, and sanitary sewer analysis and design. Prerequisite: ESCI 322. Offered every spring semester.
CVNG 314 Hydraulic Engineering Laboratory (1)

Overview and use of measurement methods that can evaluate hydraulic and hydrologic conditions and an introduction to computational methods used hydraulic and hydrologic analysis and design. Co-requisite: CVNG 313. Offered every spring semester.

CVNG 315 Introduction to Structural Design (3)


CVNG 401 Senior Engineering (1)

Review of topics related to FE exam. Offered every spring semester.

CVNG 403 Foundation Engineering (3)

Application of the fundamental concepts of soil behavior to evaluate, select, and design shallow and deep foundation systems. Topics include the design and analysis of footing, mat, pier, and pile foundations. Professional development elective. Prerequisite: CVNG 309.

CVNG 450 Capstone Design I (3)

Interdisciplinary teams working on an open-ended project. Topics include application of civil engineering principles to design problems with an emphasis on large-scale problem solving, engineering professional practice and ethics, and sustainability principles. Written, graphical and oral communications will be an integral part of the course. Prerequisites: CVNG 301, 303, 305, 307, 309, 311, 313, and 315Offered every fall semester.

CVNG 451 Capstone Design II (3)

Continuation of Capstone Design I. Prerequisite: CVNG 450. Offered every spring semester.