

Undergraduate Civil Engineering Courses

CVEN 2200. Surveying. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).

Introduction to the principles of measurements of distances, angles, and elevations; use of modern surveying equipment, area calculations, effects of observation errors; topographic mapping, traverse and area computations, and triangulation. Prerequisites: ENGR 1211; MATH 2413 or concurrent registration. Lab fee: \$2.

CVEN 22325. DO NOT USE. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**CVEN 2235. Civil Engineering Graphics. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**

Introduction to technical drawing applied to civil engineering; design and drawing of various reinforced concrete structure members and connections; use of computer graphic tools, such as AUTOCAD for drawing geometric construction, isometric projection, sectional view, dimensioning, multi-view projections and plans. Lab fee: \$2.

CVEN 2312. Intro to Civil Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Introduction to the disciplines of civil engineering practice through understanding of various sub-specializations within civil engineering discipline such as geotechnical, structural, transportation, water resources and environmental engineering; sustainable design approaches to civil engineering projects through critical thinking and environmental stewardship; and professional and ethical obligations of civil engineering profession. Prerequisite: ENGR 1212 or concurrent registration.

CVEN 3301. Structural Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).

Introduction to the basic principles of structural analysis; various methods of analyses for beams, trusses, rigid frames, as well as statically indeterminate beams and trusses; laboratory component includes the modeling of structural deflections, reactions, internal forces of frame and truss structures using software such as RISA-3D, SAP2000 and/or MATLAB. Prerequisite: CVEN 3423 Lab fee: \$2.

CVEN 3320. Construction Planning and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Importance of construction planning and management from awarding contract to completion; construction equipment and management techniques; scheduling, and control techniques in civil engineering; scheduling, progress monitoring, and recovery schedules, and use of tools for schedule optimization. Prerequisite: CVEN 2312.

CVEN 3325. Contracts and Construction Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Legal aspect of construction industry, ownership, and contractor; contracts and contracting procedure; drawing and specifications used in contract, cost estimation and bidding; contract surety bonds, construction insurance; construction project management and administration; effective project time management; project cost management; prevailing labor market, labor laws, and labor relations; ethics and project safety aspect of construction engineering. Prerequisites: ENGL 1302; CVEN 2310; CVEN 2325.

CVEN 3423. Strength of Materials. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).

Application of the theory of strength of materials to engineering design and analysis. Topics include stresses and strains in members subjected to tension, compression, torsion, and shear; flexural and shearing stresses in beams, principal stresses and deflection of beams, column analysis. Prerequisite: ENGR 2321 Lab fee: \$2.

CVEN 3430. Civil Engineering Materials. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).

Introductions to materials engineering; general properties and behavior of construction materials used in civil engineering particularly their mechanical and non-mechanical properties of cement, aggregate, concrete, metals, steel, aluminum, plastics, wood, and composites; environmental influences and construction material behavior; laboratory evaluation of civil engineering material properties through experiments; standard specifications for material properties, techniques for testing. Prerequisite: CVEN 2312 Lab fee: \$2.

CVEN 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 1-4 Hours).

Directed study of selected topics in Civil Engineering. May be repeated with approval of department head.

CVEN 4305. Reinforced Concrete Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Flexural analysis and design of reinforced concrete beams including singly and doubly reinforced rectangular beams and T-beams, shear and diagonal tension, serviceability, bond, anchorage and development length, short and slender columns, slabs, footings, and retaining walls, including computer software and a design project. Prerequisite: CVEN 3423.

CVEN 4306. Steel Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).

Fundamentals of analysis and design of steel structures; structural elements; simple and eccentric connections; includes a design project. Prerequisite: CVEN 3423.

CVEN 4325. Foundation Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).

Focuses on geotechnical design of shallow foundations, including spread footings, mats, driven piles, and drilled piers; coverage of bearing capacity, settlement, group effects, lateral load capacity of various foundation types; subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods. Prerequisites: CVEN 2312 and ENVE 2311 Lab fee: \$2.

CVEN 4360. Highway Planning and Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).

This course aims to help students understand the basic principles and techniques in highway planning and design. It includes highway planning process, design of the alignment of intersections, evaluation of earthwork requirements, and safety consideration. Upon completion students should be able to perform basic highway design. The course also covers the topics in highway design in the FE exam. Prerequisite: ENGR 3311 Lab fee: \$2.

CVEN 4450. Transportation Engineering. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI (<http://catalog.tarleton.edu/academicaffairs/>)]

Introduction to highway engineering and traffic analysis; geometric design of highways, traffic flow and queuing theory, highway capacity and level of service analysis, traffic control and analysis at intersections, travel demand and traffic forecasting. Prerequisite: CVEN 2312 Lab fee: \$2.