TCET Civil Engineering Technology

TCET 2241 Surveying
0.4 Credit Hours. 0.2 Lecture Hours. 0.4 Lab Hours.
Principles of the level, theodolite, EDM, total station and global positioning system, taping, note keeping, coordinate geometry, control surveys, triangulation, trilateration, plane coordinate systems, azimuth and topographic mapping. Laboratory includes use of level, theodolite, EDM, total station, GPS, traverse closure, topographic mapping, measuring distances and heights using coordinate geometry calculations.
Prerequisite(s): MATH 1113, MATH 1441, MATH 2242.

TCET 3141 Environmental Pollution
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Prerequisite(s): CHEM 1145 or CHEM 1147.

TCET 3142 Structural Analysis
0.4 Credit Hours. 0.3 Lecture Hours. 0.3 Lab Hours.
Introduction to types of structures and loads. Analysis of statically determinate and indeterminate structures by classical and other methods. The types of structures covered include beams, plane trusses and plane frames. Topics include external and internal reactions, deflections, moving loads and influence lines, approximate methods (including portal method and cantilever method), classical slope-deflection and moment distribution methods, and an introduction to matrix method. Computational laboratory activities in support of instruction, including use of industry-standard structural analysis software.
Prerequisite(s): TENS 2138, ENGR 1731, TENS 2143, MATH 2242.

TCET 3233 Transportation Systems
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Overview of transportation engineering with respect to operational and traffic characteristics of land, air and water transportation systems. Emphasis on design and traffic control devices. Laboratory involves data measurement and analysis techniques associated with transportation engineering.

TCET 3234 Construction Materials
0.3 Credit Hours. 0.2 Lecture Hours. 0.3 Lab Hours.
Introduction to engineering properties of common civil engineering materials including metals, soils, aggregates, Portland cement concrete, asphalt concrete, wood, and masonry. Laboratory involves performance of standard tests on aggregates, concretes, wood; emphasizing data analysis and application of test results to design specifications.
Prerequisite(s): TENS 2143.

TCET 3236 Project Cost Analysis, Planning and Management
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course focuses on the cost estimating process related to the site work and highway construction industry, and examines construction drawings and specifications documents as they relate to cost estimation process. The course also covers key aspects of project planning, scheduling, and management. Topics include: bid documents, estimating process, cost of labor and equipment, handling and transporting materials, earthwork and excavation, computerized estimating, techniques for economy studies of multiple alternatives, project scheduling, project management, and safety.
Corequisite(s): TCET 3234.

TCET 4141 Water Supply Systems
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Parameters, equations and procedures for the design of wastewater and storm water collection systems, parameters, equations and procedures for the design of water distribution systems, pumps, pump curves, pumping stations, sizing storage tanks and wetwells. Design of wastewater and stormwater collection systems. Rainfall-runoff computations. Hardy-Cross method for pipe networks. Design of culverts, drop structures, sheet flow, computer programs for unlined channel design.
Prerequisite(s): TENS 2144.
Cross Listing(s): TCET 4141H.

TCET 4141H Water Supply Systems-Honors
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Parameters, equations and procedures for the design of wastewater and storm water collection systems, parameters, equations and procedures for the design of water distribution systems, pumps, pump curves, pumping stations, sizing storage tanks and wetwells. Design of wastewater and stormwater collection systems. Rainfall-runoff computations. Hardy-Cross method for pipe networks. Design of culverts, drop structures, sheet flow, computer programs for unlined channel design.
Prerequisite(s): TENS 2144.
Cross Listing(s): TCET 4141.

TCET 4142 Reinforced Concrete Design
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Characteristics of concrete materials, introduction to ACI building code requirements for reinforced concrete, strength design of slabs, beams, columns and footings. Design/computational laboratory activities in support of instruction.
Prerequisite(s): TCET 3142.

TCET 4146 Structural Steel Design
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Characteristics of structural steels, introduction to AISC Load and Resistance Factor Design (LRFD) specifications. Design of tension members, columns, beams, beam-columns and connections. Design/computational laboratory activities in support of instruction.
Prerequisite(s): TCET 3142.

TCET 4243 Highway Design
0.4 Credit Hours. 0.3 Lecture Hours. 0.3 Lab Hours.
A synthetic approach to highway design based on considerations of geometric controls, structural requirements, drainage needs, and economy. Laboratory includes design projects, field stake out of horizontal curves, cross-sectioning, and slope staking.
Prerequisite(s): TCET 2241, TCET 3234, TCET 3233.

TCET 4244 Soil Mechanics and Foundations
0.4 Credit Hours. 0.3 Lecture Hours. 0.2 Lab Hours.
Introduction to soil mechanics and foundations, including: soil composition, index properties, classification, exploration, compaction, permeability and seepage, stress distribution, consolidation, settlement, shear strength, bearing capacity, lateral earth pressure; application of soil mechanics to design of footings and analysis of retaining walls and pile foundations. Laboratory includes evaluation of soil properties, using the test results in design and analysis.
Prerequisite(s): TENS 2143, TENS 2138.

TCET 4245 Water-Wastewater Treatment
0.4 Credit Hours. 0.3 Lecture Hours. 0.3 Lab Hours.
Sources and characteristics of water and wastewater. Principles of design for units and processes in water and wastewater treatment plants. Treatment standards. Standard laboratory tests used to control the operation of water and wastewater treatment plants. Field trips to water and wastewater treatment plants. Computer program design of water treatment units.
Prerequisite(s): TCET 3141, TENS 2144.
Cross Listing(s): TCET 4245H.
TCET 4245H Water-Wastewater Treatment
0.4 Credit Hours. 0.3 Lecture Hours. 0.3 Lab Hours.
Sources and characteristics of water and wastewater. Principles of design for units and processes in water and wastewater treatment plants. Treatment standards. Standard laboratory tests used to control the operation of water and wastewater treatment plants. Field trips to water and wastewater treatment plants. Computer program design of water treatment units.
Prerequisite(s): TCET 3141, TENS 2144.
Cross Listing(s): TCET 4245.

TCET 4536 Senior Project
3 Credit Hours. 0 Lecture Hours. 6 Lab Hours.
Designed to be culmination of the undergraduate civil engineering technology education, the course draws together diverse elements of the CET curriculum to provide integrating experiences and to develop competence in focusing both technical and nontechnical skills in solving problems. The project involves design and analysis of a new or modified civil engineering project or system with demonstration feasibility.
Prerequisite(s): TCET 4142, TCET 4146.

TCET 4890 Special Problems in CET
1-4 Credit Hours. 0 Lecture Hours. 0-4 Lab Hours.
Individual and specialized study in areas of civil engineering technology (CET) not otherwise covered in the student's program.