

CONSTRUCTION ENGINEERING TECHNOLOGY (CET)

CET 101 Construction Industry Introduction Credits: 3

Typically Offered: Fall, Spring.

Course Description: This foundational course introduces students to the diverse construction industry. Topics include various business sectors and companies, project and contract delivery methods, and the roles of key stakeholders such as owners, contractors, and engineers. Students will learn essential construction terminology and processes involved in managing construction projects. The course highlights the importance of reading and interpreting working drawings and construction documents, utilizing computer technologies, and understanding legal and safety requirements. By the end of the course, students will have a comprehensive overview of career opportunities in construction and the skills necessary for success in the field.

CET 105 Construction Materials Credits: 3

Typically Offered: Fall.

Course Description: Introductory study of materials used in the construction industry. Materials are studied with regard to properties of their substances and utilization in construction.

CET 202 Surveying I Credits: 3

Typically Offered: Fall.

Course Description: Introduction to the basic principles of plane surveying with applications to engineering and construction problems; uses laboratory periods for in-the-field applications of introductory surveying techniques. Relevant computer software will be used. Two hours lecture, three hours lab. **Prerequisite(s):** Credit or concurrent enrollment in both MAT 116 and MAT 119.

CET 250 Introduction to Statics, Strength of Materials and Structures Credits: 4

Typically Offered: Spring.

Course Description: Studies fundamentals of statics and mechanics of materials as they apply to construction processes such as statics equilibrium, axial, torsional, bending, and stress and strain analysis. Introduction to various methods used in analysis of structures such as beams, trusses and frames will be included. Three hours lecture, three hours lab. **Prerequisite(s):** MAT 116 and MAT 119.

CET 252 Advanced Surveying Credits: 3

Typically Offered: Spring.

Course Description: Intermediate and advanced surveying techniques and procedures with applications to engineering and construction problems; includes mapping, hydrography, and photogrammetry; promotes in-the-field application of techniques. **Prerequisite(s):** CET 202 and credit or concurrent enrollment in EGT 205.

CET 254 Construction Methods and Equipment Credits: 4

Typically Offered: Spring.

Course Description: Introduction to the basic knowledge and skills of methods of building construction including foundation, structural framing, floor, roof, and wall systems; to the acquisition, selection, and use of construction equipment; and to the reading of construction blueprint drawings and specifications. Three hours lecture, three hours lab. **Prerequisite(s):** CET 105.

CET 255 Legal Aspects of Boundary Surveying Credits: 3

Typically Offered: Fall.

Course Description: Includes preparation of plats and writing of property descriptions referenced to Public Land Surveys of Subdivision of Townships and Sections. Discusses surveying and land right terminology as well as resurveying, retracing, restoration, monumentation and dedication. Also studies selected case law. Computer programs and field trips will be utilized. **Prerequisite(s):** Credit or concurrent enrollment in CET 202.

CET 256 Bituminous, Concrete and Soils Credits: 3

Typically Offered: Spring.

Course Description: Studies the properties and engineering applications of prime materials used in structural and roadway construction, including classification, basic quality control, and construction practices used with respect to asphalt, concrete, and soils. Two hours lecture, three hours lab. **Prerequisite(s):** CET 105.

CET 260 Mechanics of Materials Credits: 4

Typically Offered: Spring.

Course Description: Axial, torsional, bending, and combined stress and strain analysis; mechanical properties and applications for static, fatigue, creep, and impact conditions; emphasizes beam stresses and deflections, columns, and riveted and welded connections. There will be specific emphasis on quality and accuracy for reports and assignments. Three hours lecture, three hours lab. **Prerequisite(s):** EGT 260.

CET 265 Subdivision Planning and Layout Credits: 3

Typically Offered: Spring.

Course Description: Platting of boundaries, topographic layout, planning and layout for streets, sewers and water lines. Building site surveys. **Prerequisite(s):** CET 202.

CET 270 Electrical Installations Credits: 3

Typically Offered: Spring.

Course Description: Studies of DC circuits and electrical components, including conductors, insulators, resistors, inductors, capacitors, switches, voltage and current sources. Fundamentals of AC circuits, motors and generators, three-phase industrial power, power generation, distribution, transmission, and transformers. Includes laboratory sessions to demonstrate and reinforce understanding of these topics. Two hours lecture, three hours lab. **Prerequisite(s):** CET 105 or EGT 220.

CET 290 Construction Technology Internship Credits: 1-3

Typically Offered: Fall, Spring, Summer.

Course Description: Intended for students working full-time or part-time for a company in a job related to their major, which reinforces and extends knowledge and skills. Requires periodic progress reports, supervisor evaluation and a formal final report addressing the experience and the educational benefits derived. **Prerequisite(s):** Departmental approval.

CET 302 Electronic Surveying Credits: 4

Typically Offered: Spring.

Course Description: Land surveying work utilizing electronic surveying equipment including but not limited to: total station with data collector, topographic surveying utilizing data collection down-loaded into software program utilizing AutoCAD for topographic contouring, utilization of collected data for microstation mapping, utilization of GPS equipment for traversing and also techniques of GIS mapping. **Prerequisite(s):** CET 202 and credit or concurrent enrollment in EGT 205.

CET 308 Analysis of Structures Credits: 3**Typically Offered:** Fall.**Course Description:** Introduction to various methods used in the analysis of statically determinate and indeterminate structures. Load path, load tracing, and code provisions are discussed. Three hours lecture.**Prerequisite(s):** CET 260 and MAT 147.**CET 315 Mechanical Systems Credits: 3****Typically Offered:** Fall.**Course Description:** Principles of water supply and treatment, plumbing, sanitation systems, heating, ventilation and air conditioning. Two hours lecture, three hours lab. **Prerequisite(s):** CET 105.**CET 351 Construction Estimating I Credits: 3****Typically Offered:** Spring.**Course Description:** An introduction to estimating techniques in construction projects. The course will focus on quantity take-offs such as earthwork, concrete, masonry, metals, woods, finishes, thermal and moisture protection, HVAC, and electrical. Includes overview of the estimating and bidding process, estimate development, labor rates, material pricing, and errors in estimates. Includes computer applications and ethical issues in bidding. Two hours lecture, three hours lab.**Prerequisite(s):** CET 105 and EGT 205.**CET 358 Structural Steel and Wood Design Credits: 3****Typically Offered:** Spring.**Course Description:** Introduction to elementary structural steel and wood design; design of individual members and their connections as dictated by various specifications (AISC, AITC, AASHTO, etc.). Includes computer techniques in the areas of structural analysis/design. **Prerequisite(s):** CET 308.**CET 360 Construction Management Credits: 3****Typically Offered:** Fall.**Course Description:** Introduction to the business of construction including professional responsibilities and roles of the contractor, superintendent, designer, owner and inspector; study of bid package, issues during construction phase, and project delivery methods. Includes construction contracts, procurement, planning, scheduling, safety, cash flow, value of diversity in the construction industry, and risk management.**Prerequisite(s):** CET 105**CET 362 Construction Safety Credits: 3****Typically Offered:** Fall.**Course Description:** Review of existing safety requirements pertaining to Construction and Industrial Works, and discusses practices utilized to comply with these regulations. All OSHA regulations pertaining to construction as well as CFR documents are discussed. **Prerequisite(s):** CET 105.**CET 390 Technological Projects Credits: 1-3****Typically Offered:** Fall, Spring, Summer.**Course Description:** Intended for the advanced student whose project would enrich the educational experience. Approval by the Department Chairperson is required at least two weeks before the end of the previous term. May be taken for up to 4 credit hours.**CET 408 Design of Concrete and Masonry Structures Credits: 3****Typically Offered:** Spring.**Course Description:** Introduction to the design of reinforced concrete and masonry structures. Designs are based on the current ACI codes. Class assignments or projects will require integration, knowledge from preceding courses and application of problem-solving skills acquired throughout the entire curriculum. **Prerequisite(s):** CET 308.**CET 451 Advanced Construction Estimating and Bidding Credits: 2****Typically Offered:** Fall.**Course Description:** Advanced study of estimating and bidding procedures for construction projects. Includes unit price estimating, conceptual estimating, lump sum estimating, detailed estimating, production rates, subcontract pricing, overhead allocation, markups, bidding strategies, and presentation of the bid. Use of computer software and research skills for continuous improvement. One hour lecture, three hours lab. **Prerequisite(s):** CET 254 and CET 351.**CET 456 Construction Contracts Administration Credits: 3****Typically Offered:** Spring.**Course Description:** Emphasis is given to the interpretation and preparation of construction project documents. Subjects such as contract agreement, breach of contract, termination of agreements, materials specifications, workmanship specifications, general conditions, insurance, bonds, arbitration, labor law, disadvantaged business requirements, and cases related to finance are discussed. **Prerequisite(s):** CET 360.**CET 458 Soil Mechanics and Foundations Credits: 3****Typically Offered:** Fall.**Course Description:** Studies advanced topics in the properties of soils with applications in civil engineering design and construction. Class assignments or projects will require integration, knowledge from preceding courses and application of problem-solving skills acquired throughout the entire curriculum. Two hours lecture, three hours lab.**Prerequisite(s):** CET 256 and CET 260.**CET 480 Construction Planning and Scheduling Credits: 3****Typically Offered:** Spring.**Course Description:** Principles and techniques used to plan construction and schedule project activities. Networks, bar charts, computer techniques, productivity, construction time and cost parameters. Cash flow analysis, resource planning and control, and preparation of cost-to-complete reports will be discussed. Class assignments or projects will require integration, knowledge from preceding courses and application of problem-solving skills acquired throughout the entire curriculum.**Prerequisite(s):** CET 451.**CET 485 Selected Topics in Construction Credits: 3****Typically Offered:** Spring.**Course Description:** Study of selected topics, such as underground construction, underpinning, formwork and other project support requirements; evaluation and review of current practices in construction. The course includes study and research in a specific area that combines major elements from previous construction engineering technology courses culminating in an integrating experience through individual and/or group projects, technical reports and presentations. **Prerequisite(s):** CET 105 and CET 254.**CET 490 Building Codes, Standards, and Practices Credits: 3****Typically Offered:** Departmental Discretion.**Course Description:** Emphasis on content of the four main U.S. Building Codes and the interpretation of these codes from the contractors perspective. Also covers code enforcement procedures used by administration offices of municipal governments. Class exercises involve the review of plans and specifications to determine code compliance.**Prerequisite(s):** CET 451 and CET 480.

CET 492 Computer Tools for Construction Credits: 3

Typically Offered: Fall.

Course Description: This course equips students with the skills to leverage computer tools for solving practical challenges in the construction industry. Key topics include computer-integrated quantity takeoff, scheduling, supply chain management, process monitoring and control, and payment tracking. The weekly lecture introduces essential theoretical concepts, providing a foundation in the principles of construction management technologies. In the lab sessions, students will apply these concepts using industry-standard software, gaining hands-on experience with real-world scenarios. By the end of the course, students will be proficient in utilizing computer tools to optimize construction processes and improve project efficiency. Must be taken concurrently with CET 480.