CONSTRUCTION ENGINEERING AND MANAGEMENT (CEMT)

CEMT 1000 - Introduction to Construction Management (1 Credit)
Course provides an introduction to the construction industry and project management. Student will learn basic CM terminology, roles and responsibilities associated with a construction project, and construction documents. Max hours: 1 Credits.
Grading Basis: Letter Grade

CEMT 2100 - Construction Management Fundamentals (3 Credits)
This course focuses on introducing the field of construction engineering and management. Topics will include introduction to construction management and work process; drawings; cost estimating; project planning and control; construction operations and job site management; quality and safety management; and building information modeling. Course participants will gain knowledge about construction engineering and management through lectures, exercises, class presentations, projects and group activities. Course includes a field trip to a construction site and guest speakers from the construction industry as the course time allows. Max hours: 3 Credits.
Grading Basis: Letter Grade

CEMT 2300 - Heavy Civil Construction and Equipment (3 Credits)
Course includes an introduction to heavy civil construction equipment, materials, labor and methods. Students will learn to perform comparative cost analysis for owning and operating heavy equipment; and perform the proper selection, applications, utilization and productivity of heavy equipment with the associated labor and logistics. Max hours: 3 Credits.
Grading Basis: Letter Grade

CEMT 3100 - Field Engineering and Management (3 Credits)
This course includes an overview of field engineering and management. Students will assess basic design of temporary structures, quality assurance and quality control, and materials testing and processing. Students will learn the fundamentals of soils engineering. Students will be able to apply surveying concepts and generate site layout. Students will learn the basics of safety, accident prevention, risk management, and regulatory compliance on construction sites. Prereq: CEMT 2100 or CVEN 4230 with a C- or better. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: CEMT 2100 or CVEN 4230 with a C- or better.

CEMT 3231 - Construction Materials and Methods (3 Credits)
This course serves as an introduction to the primary materials and methods used to construct buildings and infrastructure across the United States, including concrete, wood and steel. Students explore processes related to specifying and installing materials, as well as analyze various material performance characteristics. Students are required to complete lectures, videos and class activities. Students also research and present information on a wide range of materials and construction processes. Prereq: CEMT 2100 with a C- or better. Cross-listed with CEMT 5231. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: CEMT 2100 with a C- or better.

CEMT 4067 - Construction Senior Capstone (3 Credits)
Students will work in teams to formulate or design a construction project requiring the synthesis of material learned in previous courses. The student teams will establish goals, plan and accomplish tasks, meet deadlines, analyze risk and uncertainty, and demonstrate leadership and management skills. Teams will coordinate and communicate with a range of stakeholders and give final presentations. Prereq: CEMT 2100 or CVEN 4230 with a C- or better. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: CEMT 2100 or CVEN 4230 with a C- or better.

CEMT 4232 - Construction Planning and Control (3 Credits)
This course presents knowledge on planning and controlling of construction projects. Students will learn the basics of construction planning to develop work breakdown structure and activity list, estimate activity cost and duration, and identify job logic and precedence relationships. Several scheduling techniques will be presented in this class, including bar chart, network scheduling, uncertainty in scheduling (PERT), limited resources scheduling, resource leveling, line of balance, and time-cost tradeoff analysis. Furthermore, this class will provide knowledge on cash flow analysis and construction control techniques such as Earned Value method. Students will acquire skills on the use of currently available computer scheduling and planning software such as Primavera 6 and Navisworks Manage to create 5D models to visualize sequence of the construction activities. In addition, students will forms teams and work on a project throughout the semester to apply the skills that they learn in class. Prereq: CEMT 2100, CEMT 2300, CEMT 3100, CEMT 3231 and a statistics course (MATH 2830, 3800, CVEN 3611, ELEC 3817, or BANA 2010) with a C- better or instructor permission; Restriction: Restricted to students with senior standing. Cross-listed with CVEN 5232. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: CEMT 2100, CEMT 2300, CEMT 3100, CEMT 3231 and a statistics course (MATH 2830, 3800, CVEN 3611, ELEC 3817, or BANA 2010) with a C- better or instructor consent; Restriction: Restricted to students with senior standing.

CEMT 4233 - Construction Cost Estimating (3 Credits)
This course presents the application of scientific principles to rough and detailed cost estimating for construction. The course starts with an introduction to estimating and how it fits in bid/proposal process and construction management. Quantity take offs, putting costs to those relationships. Several scheduling techniques will be presented in this class, including bar chart, network scheduling, uncertainty in scheduling (PERT), limited resources scheduling, resource leveling, line of balance, and time-cost tradeoff analysis. Furthermore, this class will provide knowledge on cash flow analysis and construction control techniques such as Earned Value method. Students will acquire skills on the use of currently available computer scheduling and planning software such as Primavera 6 and Navisworks Manage to create 5D models to visualize sequence of the construction activities. In addition, students will forms teams and work on a project throughout the semester to apply the skills that they learn in class. Prereq: CEMT 2100, CEMT 2300, CEMT 3100, CEMT 3231 and a statistics course (MATH 2830, 3800, CVEN 3611, ELEC 3817, or BANA 2010) with a C- better or instructor permission; Restriction: Restricted to students with senior standing.

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CEMT 4234 - Sustainable Construction (3 Credits)
This course will serve as an introduction to major components and technologies used in sustainable design and construction to create healthy, environmentally-sensitive built environments. Content focuses on construction processes, renewable energy systems, healthy buildings, natural and cultural resources, and traditional as well as cutting-edge building techniques. Course participants will gain knowledge about effective sustainable practices through active learning by engaging in case studies, class presentations, and group activities. Numerous guest speakers will share first-hand experience regarding implementation and professional practice of sustainable principles in the real-world. Prereq: CEMT 2100, CEMT 2300, CEMT 3100, and CEMT 3231 all with a C- or better. Cross-listed with CEMT 5234. Max hours: 3 Credits. Grading Basis: Letter Grade
Prereq: CEMT 2100, CEMT 2300, CEMT 3100, and CEMT 3231 all with a C- or better.

CEMT 4236 - Project Management Systems (3 Credits)
Address the basic nature of managing projects and the advantages and disadvantages to this approach. Introduce the characteristics, techniques, and problems associated with initiating, planning, executing, controlling, and closeout of projects. Learn about the International Standards of PM and how to use them. Develop a management perspective about projects to help develop future project managers. Restriction: Restricted to CMGT-BS or CEMT-BS majors or CMGT minors. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to CMGT-BS or CEMT-BS majors or CMGT minors.

CEMT 4239 - Introduction to Temporary Structures and Construction Engineering (3 Credits)
This course will introduce the many types of temporary structures that are integral in the completion of construction projects. The temporary structures to be discussed include but are not limited to formwork, falsework, scaffolding, Support of Excavation (SOE), and equipment bridges. Construction Engineering will also be introduced including the application of structural engineering to crane picks and demolitions. The course includes planning, management and design aspects. The project includes the delivery of a formwork design that stresses the importance of constructability, cost, while providing updates throughout the project to the instructor. Cross-listed with CEMT 5239. Prereq: CEMT 2100 with a C- or better and junior standing or higher. Max hours: 3 Credits. Grading Basis: Letter Grade
Prereq: CEMT 2100 with a C- or better and junior standing or higher.

CEMT 4240 - Building Information Modeling (BIM) (3 Credits)
Building Information Modeling is an advanced approach to facility design and construction using object-oriented 3-D models. It can be integrated in the design and construction for analytical purposes, including design, visualization, quantity takeoff, cost estimating, planning, and facility management. Prereq: CEMT 2100, CEMT 2300, CEMT 3100, and CEMT 3231 all with a C- or better. Cross-listed with CEMT 5240. Max hours: 3 Credits. Grading Basis: Letter Grade
Prereq: CEMT 2100, CEMT 2300, CEMT 3100, and CEMT 3231 all with a C- or better.