

# CONSTRUCTION ENGINEERING MNGMT (CEM)

## CEM 263. PLANE SURVEYING. (3 Credits)

Use of field surveying equipment; error analysis; plane surveying methods applied to construction; plane coordinate computations; topographic mapping; and introduction to GPS. Lec/lab.

**Prerequisites:** ENGR 211 with C or better or ENGR 211H with C or better

## CEM 311. HYDRAULICS. (4 Credits)

Pressure and energy concepts of fluids, fluid measurements, flow in pipes and open channels.

**Prerequisites:** ENGR 211 with C or better or ENGR 211H with C or better

## CEM 326. CONSTRUCTION SAFETY. (3 Credits)

Training in construction safety with emphasis on hazard identification, avoidance, control, and prevention. Lec/rec.

**Prerequisites:** CCE 207 with C or better or CEM 407 with C or better

## CEM 341. CONSTRUCTION ESTIMATING I. (4 Credits)

Fundamentals of estimating and bidding construction projects; plan reading, specification interpretation; quantity take-off; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; estimating profit, and computer-aided estimating.

**Prerequisites:** CEM 442 with C or better

**Recommended:** CCE 102 and CCE 201

## CEM 342. CONSTRUCTION ESTIMATING II. (4 Credits)

Fundamentals of estimating and bidding construction projects; plan reading, specification interpretation; quantity take-off; types of estimates; estimating and methods of construction for sitework, concrete, and carpentry; estimating subcontracts, estimating job overhead and home office overhead; estimating profit, and computer-aided estimating.

**Prerequisites:** CEM 341 with C or better

## CEM 343. CONSTRUCTION PLANNING AND SCHEDULING. (4 Credits)

Principles of construction planning, scheduling, and resource optimization; scheduling techniques and calculations; methods for integrating project resources (materials, equipment, personnel, and money) into the schedule.

**Prerequisites:** CEM 342 (may be taken concurrently) with C or better

## CEM 381. STRUCTURES I. (4 Credits)

Introduction to statically determinate analysis and design of steel structures. Lec/rec.

**Prerequisites:** ENGR 213 with C or better or ENGR 213H with C or better

## CEM 383. STRUCTURES II. (4 Credits)

Analysis and design of building elements of concrete and timber; detailing and fabrication. Lec/rec.

**Prerequisites:** CCE 321 (may be taken concurrently) with C or better and CEM 381 [C]

## CEM 403. THESIS. (1-16 Credits)

*This course is repeatable for 16 credits.*

## CEM 405. READING AND CONFERENCE. (1-16 Credits)

*This course is repeatable for 16 credits.*

## CEM 406. PROJECTS. (1-16 Credits)

*This course is repeatable for 16 credits.*

## CEM 407. SEMINAR. (1 Credit)

Professional practices of construction engineering management.

## CEM 431. OBTAINING CONSTRUCTION CONTRACTS. (4 Credits)

Preparing and effectively presenting detailed and complete proposals for the execution of construction projects.

**Prerequisites:** CEM 341 with C or better

**Equivalent to:** CEM 432

## CEM 432. CONSTRUCTION PROJECT PLANNING. (3 Credits)

Planning and preparing cost estimates, schedules, site logistics plans for executing construction projects; presenting written and oral construction proposals.

**Prerequisites:** CEM 341 with C or better

**Equivalent to:** CEM 431

## CEM 441. HEAVY CIVIL CONSTRUCTION MANAGEMENT. (4 Credits)

Heavy civil construction management methods. Construction equipment types, capabilities, costs, productivity, and the selection and planning of equipment needed for a project. Soil characteristics, quantity analysis, and movement on construction sites.

**Prerequisites:** FE 315 with C or better or CE 372 with C or better

## CEM 442. BUILDING CONSTRUCTION MANAGEMENT. (4 Credits)

Building construction management and methods.

**Prerequisites:** CCE 207 with C or better or CEM 407 with C or better

## CEM 443. ^PROJECT MANAGEMENT FOR CONSTRUCTION. (4 Credits)

Project management concepts for construction; concepts, roles and responsibilities, labor relations and supervision, administrative systems, documentation, quality management, and process improvement. (Writing Intensive Course)

**Attributes:** CWIC – Core, Skills, WIC

**Prerequisites:** CEM 341 with C or better and CEM 343 [C]

## CEM 471. ELECTRICAL FACILITIES. (4 Credits)

Principles and applications of electrical components of constructed facilities; basic electrical circuit theory, power, motors, controls, codes, and building distribution systems. Lec/lab.

**Prerequisites:** CCE 207 with C or better or CEM 407 with C or better

## CEM 472. MECHANICAL FACILITIES. (3 Credits)

Principles and applications of mechanical components of constructed facilities; heating, ventilating, air conditioning, plumbing, fire protection, and other mechanical construction.

**Prerequisites:** CCE 207 with C or better or CEM 407 with C or better

## CEM 541. HEAVY CIVIL CONSTRUCTION MANAGEMENT. (4 Credits)

Heavy civil construction management methods. Construction equipment types, capabilities, costs, productivity, and the selection and planning of equipment needed for a project. Soil characteristics, quantity analysis, and movement on construction sites.

**Recommended:** FE 315 or CE 372

## CEM 543. PROJECT MANAGEMENT FOR CONSTRUCTION. (4 Credits)

Project management concepts for construction; concepts, roles and responsibilities, labor relations and supervision, administrative systems, documentation, quality management, and process improvement.

## CEM 550. CONTEMPORARY TOPICS IN CONSTRUCTION ENGINEERING MANAGEMENT. (4 Credits)

Contemporary topics of emerging technologies and processes, construction engineering and management, how industry environmental change causes development of new technologies, and the applications of the technologies in the field.

## CEM 551. PROJECT CONTROLS. (4 Credits)

Advanced methods of project controls including advanced technologies and methodologies for quality, time, and cost management; project management organization models, and intra-organizational relationships.

**CEM 552. RISK MANAGEMENT IN CONSTRUCTION. (4 Credits)**

An introduction to the concept of risk in construction projects and construction firms, including risk definition, identification, assessment and management techniques; contractual risk control, sharing and shedding; and contingency management.

**CEM 553. CONSTRUCTION BUSINESS MANAGEMENT. (4 Credits)**

Introduction to concepts of business structures associated with the construction industry; enterprise-level management techniques; extra-organizational risk management; and operational management structuring.