

Course	CE 33000 – Construction Management
Type of Course	Required for Civil Engineering Program
Catalog Description	Type and functions of management, types of construction, project delivery methods, types of construction contracts, the competitive bidding process, data and project management tools, early and detailed cost estimates, project planning, project scheduling with AOA and AON using the critical path method (CPM), project scheduling with uncertainty using PERT method, resource leveling and allocation, project financing options, project cash flow analysis, computer applications.
Credits	3
Contact Hours	Class: 2, Lab: 3
Prerequisite Courses	ENGR 128 and Junior class standing
Corequisite Courses	CE210
Prerequisites by Topics	Introduction to Engineering Design
Textbook	T. Hegazy, <i>Computer-Based Construction Project Management</i> , Prentice Hall, Current Edition.
Course Objectives	<ol style="list-style-type: none">1) To introduce the students to the basic concepts and principles of construction management and engage the students in real-world projects to acquire professional experience.2) Familiarize the students with the various construction management techniques including estimation, scheduling, resource management, and project financing.3) Develop students' computer skills in managing construction projects.
Course Outcomes	Students who successfully complete this course will be able to: <ol style="list-style-type: none">1. Understand the basic concepts of construction management such as types and functions of management, project participants, life-cycle stages of projects, project delivery methods, types of contracts, and bidding. [2, 4, 7]

2. Read and understand blue prints (drawings) and other contract documents of real life construction projects. [6, 7]
3. Prepare early (preliminary) and detailed cost estimates for construction projects. [2, 6, 7]
4. Breakdown the project into work activities using the Work Breakdown Structure (WBS) and the Master Specification format and establish the logical relationship among activities. [1, 2, 6, 7]
5. Draw network diagrams for construction projects using the critical path method (CPM) activity on arrow (AOA) and activity on node (AON) networks. [1, 2, 6, 7]
6. Estimate activities' durations [6, 7]
7. Determine activities' times (early start, early finish, late start, late finish, total float, and free float) and schedule the project using the CPM and the bar chart (Gantt chart) scheduling techniques. [1, 2, 6, 7]
8. Schedule projects with uncertain durations using the program evaluation and review technique (PERT). [6, 7]
9. Smooth resource profiles (resource leveling) and schedule projects with limited resources (resource allocation) [2, 7].
10. Use Excel for data management and to user solver to find an optimum solution for construction. [6, 7]
11. Use specialized software such as Microsoft Project and/or Primavera for data management, project scheduling, resource leveling, and resource allocation. [7]
12. Use Excel for data management and to user solver to find an optimum solution for construction. [6, 7]
13. Communicate effectively while working on term project and express ideas during classroom discussions. [3, 5]
14. Understand basic concepts of Engineering Economy [7]

Lecture Topics

1. Types and functions of management and types of construction
2. Project Contract Strategy
3. Data and Project Management Tools
4. Early Cost Estimates
5. Detailed Cost Estimates
6. Project Planning
7. Project Scheduling
8. Resource Management
9. Project Financing

Computer Usage

High

Laboratory Experience	High
Design Experience	None
Coordinator	Fawad S. Niazi, Ph.D.
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