

Construction Management

Course Objective:

The objective of this course is to introduce the student to the strategies and tools practiced by the construction industry in the United States. Emphasis is on scheduling, project set-up, purchasing, risk management, quality control, contracts, and cost control. The material covered and the strategies discussed are oriented for a mid-level construction professional. The course material often includes examples of actual content used by the presenters from their construction careers. Part of the course will be devoted to a case study where students work in small teams to plan and create a schedule, work plan, and logistical study for a large commercial construction project. The case study culminates with a written and oral presentation simulating an actual opportunity to obtain construction management services for a large scale construction project.

Following is a week-by-week description of the course:

Week 1: Delivery Systems and Scheduling

Overview of the commercial construction industry in the United States. Description of the four major delivery systems that are frequently used in the United States: Lump Sum Bidding, Negotiated Construction Management, Design-Build, and Turn-Key. The pros and cons of each delivery system will be discussed.

Importance of scheduling in managing the construction process. Incorporating changing conditions into the schedule. Different types of schedules, including examples from actual construction projects.

Week 2: Project Planning and Case Study

Setting up a construction site and a review of construction logistics and project planning, including material staging, hoisting, storm water management, and techniques for winter conditions. Students will be divided into small teams and will collectively work on an actual case study, culminating in a written report and oral presentation.

Week 3: Case Study and Quality Assurance

The first period this week is devoted to completing the effort initiated in the previous week.

Introduction to quality control procedures, including preconstruction, procurement, construction, and close-out. Partnering, constructability, construction tolerances, and detailed purchase requisitions will be reviewed.

- Week 4: Claims and Construction Techniques**
Causes of common construction claims and techniques to avoid them. Review of contract language as it pertains to claims. Review and discussion of actual case studies.
- Excavation, earth retention, deep foundations, concrete, steel, precast, and curtainwall construction techniques are illustrated with video presentations for each.
- Week 5: Safety, Insurance, and First Exam**
An overview of insurance coverages and safety hazards found in the construction industry. The role of OSHA and an overview of a contractor's loss control program. This class will be presented by OSHA certified safety expert.
- The first exam will be given in the second period this week.
- Week 6: Construction Management Overview, Purchasing, and Subcontracting**
History and development of Construction Management and its vital role in project preconstruction. Why your financier wants you to know Construction Management.
- What is the concept of "buying" and what are we buying? A review of various strategies to obtain performance from subcontractors and suppliers. What are the business, political, and philosophical issues in buying? A team project will involve a critique of vendor proposals.
- Week 7: Estimating, Project Cost Control, and Effective Cost Reporting**
Techniques for generating meaningful pricing during the design process. Understanding the importance of estimates during the concept and schematic phases of the real estate development process. How to obtain an estimate when the project design is in the early stages? What is its value?
- What controls are needed during preconstruction? How do they relate to construction phase controls? How are they reported to management?
- Week 8: How to Hire a Professional Service and Construction Contracts**
Tools to help the cognitive decision making process, along with techniques for writing "Requests for Proposal". How to make a successful presentation for construction or professional services.
- Understanding proposals, essential issues in a contract, and contract performance. Strategies to induce performance. What type of contract is best for each type of construction project? Focus on the business points for both parties. A part of this class involves a team homework project.

Week 9: Construction Contracts and Bonding
Assessment of contract language with regard to risk management.
Strategies to achieve a balance among quality, price, and schedule.
Presentation and recommendations from team homework projects.

Why bonding exists. Bid, performance, and payment bonds.
Understanding mutual responsibilities in this three-party agreement.
Indemnity agreement and how it affects the business owner.

Week 10: Review and Second Exam
The first period this week will include a review and synthesis of all concepts presented.

The second exam will be given in the second period this week.

Exam Week: There will be no final exam

Text: No text is required for this course. For those who might be interested in referring to a book that explains the course material, the following is recommended:
Professional Construction Management, by Donald S. Barrie and Boyd C. Paulson, McGraw-Hill, Inc. Third Edition, 1992.

Software: None

Grade Determination:

First Exam	35%
Second Exam	35%
Case Study	20%
Special Projects	10%