

CATALOG INFORMATION

Dept and Nbr: CONS 104

Title: CONST MGMT & SCHEDULING

Full Title: Construction Management and Scheduling

Last Reviewed: 9/25/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**  
Students will be introduced to the managerial functions and operations of a construction business, including the scheduling of work, project funding, and acquiring labor, equipment, and materials for construction projects. Field trips may be required.

**Prerequisites/Corequisites:**  
Course Completion of CONS 101

**Recommended Preparation:**  
Course Completion or Concurrent Enrollment in CONS 102

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: Students will be introduced to the managerial functions and operations of a construction business, including the scheduling of work, project funding, and acquiring labor, equipment, and materials for construction projects. Field trips may be required. (Grade Only)  
Prerequisites/Corequisites: Course Completion of CONS 101  
Recommended: Course Completion or Concurrent Enrollment in CONS 102  
Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>		Effective:	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Plan the proper construction sequencing and order of operations for a typical building project.
2. Analyze the interdependencies of different construction sequences and processes.
3. Explain the benefits and risks associated with different forms of business ownership.
4. Identify standard methods within a construction project to control costs.

### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Manage different phases of construction for scheduling purposes.
2. Analyze the dependencies of different construction processes and materials placement.
3. Calculate activity durations and dependencies and provide estimated schedules for a construction project.
4. Investigate the different forms of business ownership.

### **Topics and Scope:**

- I. Construction Management History and Basic Concepts
  - A. An historical overview of modern construction management
  - B. Construction project development overview
  - C. Components of a construction project
    1. Construction technology
    2. Construction management
    3. Management levels of construction
- II. The Bid Package
  - A. Drawings
    1. Conceptual
    2. Design development
    3. Approved construction drawings
  - B. Estimates

1. Preliminary
2. Development: developed, refined, approved, accepted, and finalized
- C. Notice to bidders
- D. The project bid package
  1. Drawings
  2. General conditions
  3. Supplementary conditions
  4. Technical specifications
  5. Addenda
  6. Bid bond
  7. Performance and payments bonds
- E. Decision to bid and response
- F. Prequalification
- G. Subcontractor and vendor quotations
- III. Project-Related Procedures and Issues
  - A. Acceptance period or withdrawal
  - B. Award of contract and notice to proceed
  - C. Contract agreement
  - D. Time extensions
  - E. Change orders
  - F. Changed conditions
  - G. Value Engineering (VE)
  - H. Suspension, delay, or interruption
  - I. Liquidated damages
  - J. Progress payments and retainage
  - K. Progress reporting
  - L. Acceptance and final payment
- IV. Contracts
  - A. Major construction contract types
    1. Stipulated sum
    2. Unit-price
    3. Negotiated
    4. Design-build
    5. Construction management
    6. Time and material
    7. Home improvement
  - B. Prime versus sub-contracts
  - C. Material supply contracts
  - D. Typical contract forms
    1. American Institute of Architects (AIA) contract forms
    2. Association of General Contractors (AGC) contract forms
  - E. Change orders
- V. Construction Company Structure and Business Operating Costs
  - A. Business ownership structure
    1. Proprietorship
    2. Partnership
    3. Corporation
    4. Joint venture
  - B. Business taxation
    1. Business deductions in general
    2. Taxable income
    3. Itemized deductions, standard deductions, and personal exemptions

- 4. Tax payroll withholding
- 5. Sales tax
- C. Workers Compensation and insurance-related issues
- VI. Project Scheduling
  - A. Estimating activity durations
  - B. Using historic productivity data
  - C. Bar charts
  - D. Scheduling logic
  - E. Scheduling networks
  - F. The critical path method
    - 1. Predecessors and successors
    - 2. Process time
    - 3. Float
  - G. Adjusting schedules
  - H. Working to calendar dates
  - I. Milestones
  - J. Long lead times
  - K. Computer-generated scheduling
  - L. Resource-related and advanced linear scheduling techniques
- VII. The Mathematics of Money
  - A. Time value of money
  - B. Simple and compound interest
  - C. Discount rate
  - D. Cash flow diagrams
- VIII. Project Cash Flow
  - A. Cash flow projection
  - B. Cash flow to the contractor
  - C. Overdraft requirements
  - D. Effect of retentions and timing of receivables
  - E. Processing change orders
  - F. Billing formats and frequency
- IX. Project Funding
  - A. Construction financing process
  - B. Construction loan
  - C. Verification of funds
  - D. Contingency allowances
- X. Equipment Ownership
  - A. Equipment ownership and operating costs
  - B. Depreciation of equipment
  - C. Operating costs
  - D. Overhead and markup
  - E. Temporary equipment requirements
  - F. Rental equipment availability factors
  - G. Recaptured depreciation
  - H. Residual value
- XI. Construction Labor
  - A. The labor resource
  - B. Davis-Bacon Act
  - C. Unions
  - D. Open shop
  - E. Labor agreements
  - F. Labor costs

- G. Average hourly cost calculation
- H. Apprenticeship and training
- XII. The Estimating Process
  - A. Estimating construction costs
  - B. Types of estimates
  - C. Detailed estimate preparation
  - D. Quantity takeoff
  - E. Methods of detailed cost determination
  - F. Problems with unit-cost method
- XIII. Cost Control
  - A. Cost control as a management tool
  - B. Project cost control systems
  - C. Cost accounts
  - D. Cost coding systems
  - E. Project cost code structure
  - F. Cost accounts for integrated project management
  - G. Earned value method
  - H. Labor cost data collection
  - I. Charges for indirect and overhead expense
  - J. Project indirect costs
  - K. Fixed overhead
- XIV. Materials Management
  - A. Material management process
  - B. The order
  - C. Approval process
  - D. Fabrication and delivery process
  - E. Installation process
  - F. Material types
- XV. Safety
  - A. Need for safe practices
  - B. Humanitarian concerns
  - C. Economic costs and benefits
  - D. Occupational Safety and Health Administration (OSHA) requirements
  - E. Safety recordkeeping
  - F. Safety program

**Assignment:**

1. Reading assignments (10-20 pages per week)
2. Study question sets (1-3 weekly)
3. Quiz(zes) (1-4)
4. Project scheduling assignments (2-6)
5. Field reports and construction management forms (2-6)
6. Midterm exam
7. Final exam
8. Field trip(s) (0-3)

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Field reports and construction management forms

Writing  
10 - 20%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Study question sets; project scheduling assignments

Problem solving  
20 - 50%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Quiz(zes); midterm exam; final exam

Exams  
30 - 50%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Class participation

Other Category  
5 - 10%

### **Representative Textbooks and Materials:**

Instructor prepared materials