CONS 104 Course Outline as of Fall 2022

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	1.50	17.5	Lecture Scheduled	26.25
Minimum	3.00	Lab Scheduled	4.50	6	Lab Scheduled	78.75
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 52.50 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:
In this course, students will gain an understanding of the functions and operations of a construction business as related to construction projects. Students will explore topics including the process of scheduling work, providing funding, acquiring labor, equipment, and materials for construction projects and for the general operation of a construction company. Field trips will be required.

Prerequisites/Corequisites:
Course Completion of CONS 101

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: In this course, students will gain an understanding of the functions and operations of a construction business as related to construction projects. Students will explore topics including the process of scheduling work, providing funding, acquiring labor, equipment, and materials for construction projects and for the general operation of a construction company.

Field trips will be required. (Grade Only)
Prerequisites/Corequisites: Course Completion of CONS 101
Recommended:
Limits on Enrollment:
Transfer Credit:
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**	Effective:	Inactive:
CSU GE:	**Transfer Area**	Effective:	Inactive:
IGETC:	**Transfer Area**	Effective:	Inactive:

CSU Transfer:	Effective:	Inactive:
UC Transfer:	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. Describe 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. Examine construction projects during different phases of construction.
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:

Lecture and Lab
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. Construction management is resource driven

4. 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 requirements
   E. Safety recordkeeping
   F. Safety program

Assignment:

Lecture
1. Reading assignments (10-20 pages per week)
2. Study question sets (1-3 weekly)
3. Quiz(zes) (1-4)
4. Midterm exam
5. Final exam

Lab
1. Project scheduling assignments (2-6)
2. Field reports (6-12)

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	Writing 10 - 20%

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

Study question sets and 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) and exams	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