

ITT Technical Institute
CM440
Construction Project Scheduling
Onsite Course

SYLLABUS

Credit hours: 4

Contact/Instructional hours: 50 (30 Theory Hours, 20 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: CM310 Commercial Construction Methods

Course Description:

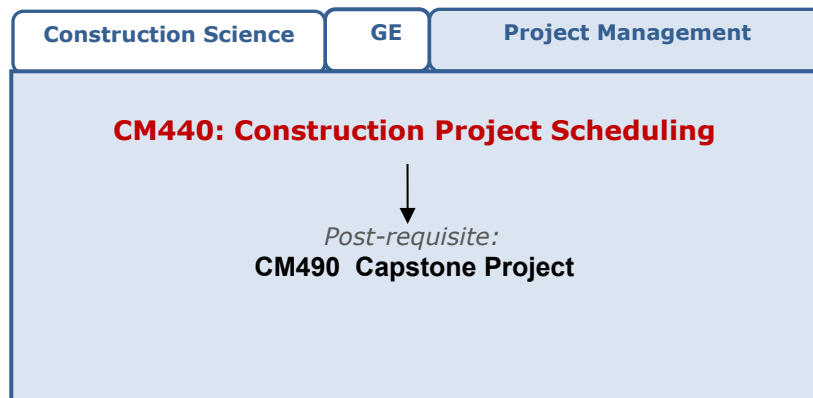
This course introduces the planning and scheduling of construction projects. Topics include time schedules for materials, labor and equipment and use of communication tools in project planning.

Where Does This Course Belong?

Construction Project Scheduling is a course required to obtain a bachelor's degree in the Construction Management program. This course introduces the aspect of planning and scheduling for construction projects and the use of software applications in determining activity lists, durations, and a schedule sequence for construction. Some of the topics included in this course are time schedules for materials, labor, and equipment, and the use of communication tools in project planning.

The following course sequence provides an overview of how Construction Project Scheduling fits into the program.

Construction Management Core



Course Summary

Major Instructional Areas

1. Review of project management basics
2. Checklists, daily to-do lists, and magnetic scheduling boards
3. Bar chart schedules
4. Introduction to CPM scheduling

5. Creating the rough logic diagram
6. Determining durations
7. Calculating start and finish dates
8. Calculating float
9. Using lags in rough logic diagrams
10. Reviewing and analyzing schedules
11. Creating bar charts and tabular reports from rough logic diagrams
12. Linear schedules
13. Updating the schedule
14. Using schedules to forecast and balance resources

Course Objectives

1. Describe project scheduling and how it relates to the construction industry.
2. Prepare a work breakdown structure and the rough logic diagram for a construction project.
3. Develop and calculate a CPM schedule.
4. Control resource management in construction scheduling.
5. Perform schedule updating and earned value analysis
6. Manage costs in construction scheduling project management software.
7. Perform schedule acceleration.
8. Produce reports that communicate the right level of information to the recipient in the most efficient manner.
9. Properly identify, document and incorporate delays into the project schedule in order to resolve construction delay claims.

Learning Materials and References

Required Resources

Textbook Package	New to this Course	Carried over from Previous Course(s)	Required for Subsequent Course(s)
Mubarak, S. (2010). Construction Project Scheduling and Control (2nd ed.). Hoboken, NJ: John Wiley and Sons, Inc.	■		■
Other Items	New to this Course	Carried over from Previous Course(s)	Required for Subsequent Course(s)
Microsoft Project		■	

Recommended Resources

Internal

- ITT Tech Virtual Library:
<http://myportal.itt-tech.edu/library/Pages/HomePage.aspx>.

External

- Periodicals:
 - Engineering News Record (ENR) (<http://enr.construction.com/>)
Find information here on news and features about construction projects.
- Professional Associations:
 - Project Management Institute (PMI) (<http://www.pmi.org/>)
PMI establishes standards for project management.
 - Associated General Contractor's of America (AGC) (<http://www.agc.org/>)
AGC is a trade association for the construction industry. It has a database of members you can access.

Information Search

Use the following keywords to search for additional online resources that may be used for supporting your work on the course assignments:

- Project scheduling
- Construction project management
- Logic diagrams
- Earned value analysis
- Schedule updating

NOTE: All links to Web references are subject to change without prior notice.

Course Plan

Instructional Methods

This course is designed to promote learner-centered activities and support the development of cognitive strategies and competencies necessary for effective task performance and critical problem solving. The course utilizes individual and group learning activities, performance-driven assignments, problem-based cases, projects, and discussions. These methods focus on building engaging learning experiences conducive to development of critical knowledge and skills that can be effectively applied in professional contexts.

Suggested Learning Approach

In this course, you will be studying individually and within a group of your peers. As you work on the course deliverables, you are encouraged to share ideas with your peers and instructor, work collaboratively on projects and team assignments, raise critical questions, and provide constructive feedback.

Use the following advice to receive maximum learning benefits from your participation in this course:

DO	DON'T
<ul style="list-style-type: none"> ▪ Do take a proactive learning approach 	<ul style="list-style-type: none"> ▪ Don't assume there is only one correct

- Do share your thoughts on critical issues and potential problem solutions
- Do plan your course work in advance
- Do explore a variety of learning resources in addition to the textbook
- Do offer relevant examples from your experience
- Do make an effort to understand different points of view
- Do connect concepts explored in this course to real-life professional situations and your own experiences

- answer to a question
- Don't be afraid to share your perspective on the issues analyzed in the course
 - Don't be negative about the points of view that are different from yours
 - Don't underestimate the impact of collaboration on your learning
 - Don't limit your course experience to reading the textbook
 - Don't postpone your work on the course deliverables – work on small assignment components every day

Course Outline

Unit	Reading Assignments	Graded Activities & Deliverables
1. Unit 1: Introduction to Construction Project Scheduling	•Mubarak, Chapters 1-3, Introduction, pp. 1-42	<ul style="list-style-type: none"> ▪ Unit 1. Writing Assignment 1. Extracting Information ▪ Unit 1. Exercise 1. Vacation Planning ▪ Unit 1. Project 1. New Building
2. Unit 2: Basic Networks	Mubarak, Chapters 3-4, pp. 21-81	<ul style="list-style-type: none"> ▪ Unit 2. Writing Assignment 1. Lags and Leads ▪ Unit 2. Exercise 1. Commercial Building Precedence Diagram ▪ Unit 2. Project 1. Remodeling Chemical Laboratory
3. Unit 3: The Critical Path Network	Mubarak, Chapters 4-5, pp. 43-110	<ul style="list-style-type: none"> ▪ Unit 3. Discussion 1. Factors Affecting Productivity ▪ Unit 3. Exercise 1. CPM Calculations ▪ Unit 3. Exercise 2. Final Schedule ▪ Unit 3. Exercise 3. Small Office Building ▪ Unit 3. Project 1. Natural Gas Compressor
4. Unit 4: Resource Allocation and Resource Leveling	Mubarak, Chapter 6, pp. 111-137	<ul style="list-style-type: none"> ▪ Unit 4. Exercise 1. Leveling Algorithms ▪ Unit 4. Exercise 2. Resource Leveling Problem Set 1 ▪ Unit 4. Exercise 3. Resource Leveling Problem Set 2 ▪ Unit 4. Project 1. Resource Allocation with Microsoft Project
5. Unit 5: Schedule Updating & Project Control	Mubarak, Chapter 7, pp. 139-188	<ul style="list-style-type: none"> ▪ Unit 5. Discussion 1. Modifying and Revising the Schedule ▪ Unit 5. Exercise 1. Earned Value Analysis ▪ Unit 5. Project 1. Updating with Microsoft Project
6. Unit 6: Schedule Compression and Time-Cost Trade-off	Mubarak, Chapter 8, pp. 189-220	<ul style="list-style-type: none"> ▪ Unit 6. Discussion 1. Determining the Costs of Accelerating a Project Schedule ▪ Unit 6. Exercise 1. Time-Cost Trade-off

		<ul style="list-style-type: none"> ▪ Unit 6. Exercise 2. Disaster Strikes! ▪ Unit 6. Project 1. Acceleration with Microsoft Project
7. Unit 7: Reports & Presentations	Mubarak, Chapter 9, pp. 221-239	<ul style="list-style-type: none"> ▪ Unit 7. Exercise 1. Reports and Presentation Questions ▪ Unit 7. Project 1. Reports and Roles
8. Unit 8: Delays and Schedule Analysis	Mubarak, Chapter 13, pp. 313-335	<ul style="list-style-type: none"> ▪ Unit 8. Exercise 1. Delays ▪ Unit 8. Exercise 2. Legal Research ▪ Unit 8. Project 1. Delays and Microsoft Project
9. Course Review and Final		<i>Final Exam</i>

Evaluation and Grading

Evaluation Criteria

The graded assignments will be evaluated using the following weighted categories:

Category	Weight
Writing Assignment	3%
Exercise	42%
Discussion	6%
Project	24%
Exam	25%
TOTAL	100%

Grade Conversion

The final grades will be calculated from the percentages earned in the course, as follows:

Grade	Percentage	Credit
A	90–100%	4.0
B+	85–89%	3.5
B	80–84%	3.0
C+	75–79%	2.5
C	70–74%	2.0
D+	65–69%	1.5
D	60–64%	1.0
F	<60%	0.0

Graded Activities and Deliverables

Grading Category	Category Weight	Graded Deliverable	Weight
Writing Assignment	9%	<i>Unit 1. Writing Assignment 1. Extracting Information</i>	1%
		<i>Unit 2. Writing Assignment 1. Lags and Leads</i>	2%
		<i>Unit 3. Writing Assignment 1. Factors Affecting Productivity</i>	2%
		<i>Unit 5. Writing Assignment 1. Modifying and Revising the Schedule</i>	2%
		<i>Unit 6. Writing Assignment 1. Determining the Costs of Accelerating a Project Schedule</i>	2%
Exercise	42%	<i>Unit 1. Exercise 1. Vacation Planning</i>	3%
		<i>Unit 2. Exercise 1. Commercial Building Precedence Diagram</i>	3%
		<i>Unit 3. Exercise 1. CPM Calculations</i>	3%
		<i>Unit 3. Exercise 2. Final Schedule</i>	3%
		<i>Unit 3. Exercise 3. Small Office Building</i>	3%
		<i>Unit 4. Exercise 1. Leveling Algorithms</i>	3%
		<i>Unit 4. Exercise 2. Resource Leveling Problem Set 1</i>	3%
		<i>Unit 4. Exercise 3. Resource Leveling Problem Set 2</i>	3%
		<i>Unit 5. Exercise 1. Earned Value Analysis</i>	3%
		<i>Unit 6. Exercise 1. Time-Cost Trade-off</i>	3%
		<i>Unit 6. Exercise 2. Disaster Strikes!</i>	3%
		<i>Unit 7. Exercise 1. Reports and Presentation Questions</i>	3%
		<i>Unit 8. Exercise 1. Delays</i>	3%

Grading Category	Category Weight	Graded Deliverable	Weight
		<i>Unit 8. Exercise 2. Legal Research</i>	3%
Project	24%	<i>Unit 1. Project 1. New Building</i>	3%
		<i>Unit 2. Project 1. Remodeling Chemical Laboratory</i>	3%
		<i>Unit 3. Project 1. Natural Gas Compressor</i>	3%
		<i>Unit 4. Project 1. Resource Allocation with Microsoft Project</i>	3%
		<i>Unit 5. Project 1. Updating with Microsoft Project</i>	3%
		<i>Unit 6. Project 1. Acceleration with Microsoft Project</i>	3%
		<i>Unit 7. Project 1. Reports and Roles</i>	3%
		<i>Unit 8. Project 1. Delays and Microsoft Project</i>	3%
Final Exam	25%	Final Exam	25%

Academic Integrity

All students must comply with the policies that regulate all forms of academic dishonesty, or academic misconduct, including plagiarism, self-plagiarism, fabrication, deception, cheating, and sabotage. For more information on the academic honesty policies, refer to the Student Handbook and the Course Catalog.

(End of Syllabus)