UNIVERSITY OF SOUTHERN CALIFORNIA
Civil and Environmental Engineering Department
Spring Semester 2013

CE 566: Project Controls – Planning & Scheduling

(Thursdays 3:30 PM)

Professor: **Russ Vakharia**
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Course Outline and Objectives:

The objective of the course is to provide students an overview of Project Controls, with a focus on Planning and Critical Path Method (CPM) Scheduling. The course begins by reviewing the various components of Project Controls, including scheduling. It continues with a review of the basic principles of CPM scheduling, scheduling contract provisions, delay analysis, risk analysis and management of the scheduling process.

The course includes some hands-on instruction in the use of Primavera scheduling software to create and manage cost and resource loaded construction schedules.

Textbook, Software & Other Tools:

TEXTBOOOK: Construction Project Scheduling and Control (Second Edition), by Saleh Mubarak, John Wiley and Sons, 2010.

Course Grading:

Midterm Exam:	25%
Final Exam:	40%
Class Project/H.W.:	25%
Class Participation:	10%

SESSION-BY-SESSION COURSE OUTLINE (Subject to Adjustment)

NOTE: Reading assignments should be read prior to the session in which they are listed.

	Sessions/Topics	Reading Assignments
1	***INTRODUCTION & OVERVIEW*** • Review syllabus and administrative issues. • Overview of the Project Life Cycle, Project Controls and Scheduling. • Benefits and pitfalls of CPM scheduling. • Introduction to basic CPM concepts.	
2	***BASIC CPM SCHEDULING CONCEPTS & TERMS*** • Review basic CPM scheduling terminology including Activities, Logic Ties, Calendars, Constraints, Float, Critical Path, Work Breakdown Structure and others. • Enter schedule network into Primavera scheduling software. • Review the schedule.	Mubarak, Chapters 1, 2, 4 (pp. 43-52), 5 (pp. 83-88), 10
3	***SCHEDULING CONTRACT PROVISIONS AND THE SCHEDULE PLANNING PROCESS*** • Review the 'contract documents' for the in-class project including: drawings, specifications and scheduling provisions. • Discuss and plan the overall approach to planning the project and building a schedule for it. • Break the project into detailed schedule activities and enter the activities into Primavera scheduling software.	Text reading TBA. Handout of contract documents for in-class exercise.
4	***DETAILED ASPECTS OF SCHEDULE PREPARATION*** • Review schedule logic ties, activity codes, milestones, calendars, constraints and resource/cost loading. • Confirm that the schedule meets contract requirements. • Troubleshoot the schedule. • Review float and critical & near critical paths. • Grouping, sorting, selecting and formatting activities.	
5	***CONSTRAINTS, CALENDARS AND COST LOADING***	

6	***UPDATING THE SCHEDULE*** • Review the updating portion of the schedule specification. • Principles of schedule updating, including adding actual dates, logic changes and reflecting schedule impacts. • Comparing two schedules using Targets, comparison software and other techniques.	Text Reading TBA.
7	***ADDITIONAL SCHEDULE UPDATING ISSUES*** • Baseline & Target schedules • Out of Sequence Progress • Float management and sequestering	Text reading TBA.
8	***OTHER SCHEDULING METHODS/ISSUES & MIDTERM REVIEW***	
9	***MIDTERM EXAM***	
10	***DELAY ANALYSIS*** • Review the different types of delay. • Review different methods of delay analysis.	Text reading TBA. Handouts on delays and delay analysis.
11	***CASE STUDY OF SCHEDULE & DELAY ISSUES***	Text reading TBA.
12	***DELAYS & OTHER ISSUES*** • Legal issues regarding delay analysis. • Quantification of delay costs. • Detecting schedule problems, including loops • Globally changing and importing/exporting data	Text Reading TBA.
13	***RISK ANALYSIS & OTHER ISSUES*** • Introduction to and overview of schedule Risk Analysis. • Real world samples of time/delay issues. • Review different approaches to scheduling used owners.	Text Reading TBA.
14	***COST/RESOURCE LOADING, REPORTING*** • Overview of cost and resource loading.	Text Reading TBA.

	• Application of cost/resource loading using scheduling software. • Resource Leveling. • Misc. topics.	
15	***MANAGEMENT & PROFESSIONAL DEVELOPMENT*** • Management and Mismanagement of the scheduling process. • Industry Standard Recommended Practices for Scheduling. • Skills required and raining of scheduling personnel. • Information on Professional Associations, scheduling certifications, job opportunities in scheduling and suggestions for future readings. • Final Exam review.	
	FINAL EXAM	