# CE 566 Project Controls – Planning and Scheduling

## 2011 Spring Semester — Course Syllabus

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Thursday</th>
<th>3:30 – 6:10 PM</th>
<th>RTH 109</th>
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<tbody>
<tr>
<td>Professor</td>
<td>Russ Vakharia</td>
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<tr>
<td>Phone</td>
<td>(310) 710-4458</td>
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<tr>
<td>Email</td>
<td><a href="mailto:RussVakharia@yahoo.com">RussVakharia@yahoo.com</a></td>
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<tr>
<td>Office Hours</td>
<td>Before and after class, or by appointment</td>
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<tr>
<td>Prerequisite</td>
<td>CE 556 (recommended)</td>
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<tr>
<td>Course Description</td>
<td>Fundamental principles and practices of planning, CPM scheduling, and resource management. Development of project schedules using CPM theory applied to current and emerging software applications. (Duplicates credit in the former CE 556b.) Open only to graduate students in engineering, architecture, business, or urban and regional planning.</td>
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<td>Course Objectives</td>
<td>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. As part of the class instruction, the instructor and students will jointly develop a cost and resource loaded construction schedule in class from a set of construction contract documents. This schedule will then be updated and different scenarios will be introduced. Time impact analyses of delay scenarios will be produced. Both the owner and contractor’s perspectives towards managing the schedule will be discussed.</td>
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<td>Final grade schema is based on percentages of graded coursework</td>
<td>Class Project; Homework</td>
<td>20 %</td>
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<tr>
<td></td>
<td>Midterm</td>
<td>25 %</td>
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<tr>
<td></td>
<td>Participation</td>
<td>10 %</td>
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<tr>
<td></td>
<td>Final Exam</td>
<td>45 %</td>
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<tr>
<td></td>
<td>Total</td>
<td>100 %</td>
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## CE 566 Project Controls – Planning and Scheduling
### 2011 Spring Semester — Course Syllabus

### Course Calendar

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<tr>
<th>Week</th>
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<th>Topics</th>
<th>Reading Assignments</th>
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</table>
| 1    | 1/13 | INTRODUCTION AND 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 terminology.  
• Hand Calculate Basic CPM Network. | |
| 2    | 1/20 | BASIC CPM SCHEDULING CONCEPTS and TERMS  
• Review basic CPM scheduling terminology including Activities, Logic Ties, Calendars, Constraints, Float, Critical Path, Work Breakdown Structure and others.  
• Enter simple schedule network into Primavera scheduling software.  
• Review the schedule. | Text reading TBA. |
| 3    | 1/27 | 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    | 2/3  | 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 and near critical paths.  
• Grouping, sorting, selecting and formatting activities. | |
| 5    | 2/10 | CONSTRAINTS, CELENDARS AND COST/RES LOADING  
• Constraints and calendars.  
• Introduction to cost and resource loading of schedules. | Text reading TBA. |
| 6    | 2/17 | 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    | 2/24 | MISC. TOPICS and MIDTERM REVIEW  
• Linear Scheduling  
• Baseline and Target schedules  
• Out of Sequence Progress  
• Float management and sequestering  
• In-class practice exercise and review of concepts. | Text reading TBA. |
| 8    | 3/3  | MIDTERM EXAM | |
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| 9    | 3/10 | OTHER SCHEDULING and PROJECT MANAGEMENT SOFTWARE  
- Review of Midterm Exam.  
- Review other CPM scheduling software.  
- Brief Review of Project Management Software.  | Handouts on other scheduling software. |
| 10   | 3/17 | NO CLASS | |
|      | 3/24 | DELAY ANALYSIS  
- Review the different types of delay.  
- Review different methods of delay analysis.  
- Briefly review acceleration and inefficiency claims.  
- Methods of entering delays into the schedule.  | Text reading TBA. |
| 12   | 3/31 | DELAY ANALYSIS CONTINUED  
- Continue discussing delay analysis issues, including software techniques for schedule analysis.  | Text reading TBA. |
| 13   | 4/7  | DELAYS and OTHER ISSUES  
- Legal issues regarding delay analysis.  
- Detecting schedule problems, including loops  
- Globally changing and importing/exporting data  
- Review some examples of ‘real world’ schedules | |
| 14   | 4/14 | RISK ANALYSIS and OTHER ISSUES  
- Introduction to and overview of schedule Risk Analysis.  
- Real world samples of time/delay issues.  
- Review different approaches to scheduling used owners. | |
| 15   | 4/21 | COST/RESOURCE LOADING, REPORTING  
- Overview of cost and resource loading.  
- Application of cost/resource loading using scheduling software.  
- Misc. topics.  
- Review of other selected course topics. | |
| 16   | 4/28 | MANAGEMENT and PROFESSIONAL DEVELOPMENT  
- Management and Mismanagement of the scheduling process.  
- 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. | Handouts. |
| 17   | 5/5  | NO CLASS | |
| 18   |      | FINAL EXAM | |
GENERAL ADMINISTRATIVE ISSUES

STATEMENT ON ACADEMIC INTEGRITY

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own.

All students are expected to understand and abide by these principles. SCampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

http://www.usc.edu/dept/publications/SCAMPUS/gov/

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:

http://www.usc.edu/student-affairs/SJACS/

STATEMENT FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible.

DSP Contact Information

Location: STU 301

Hours open: 8:30 a.m. until 5:00 p.m., Monday — Friday

Phone number: (213) 740-0776

HOW THE INSTRUCTOR WILL COMMUNICATE WITH THE STUDENTS (OUTSIDE OF CLASS) AND HOW THE STUDENTS WILL COMMUNICATE WITH EACH OTHER?

- Due to normal work commitments the professor will not be available on campus at times other than just prior to class, or by special arrangement.
- Electronic communication using the online system.
- If there are updates to online files, including new materials, assignments, completed grading assignments and examinations, email notice or electronic announcements will be posted.
THE PROTOCOLS DEFINED BY THE USC STUDENT CONDUCT CODE MUST BE UPHELD IN DISTANCE CLASSES. FOR EXAMPLE,

- Posting inappropriate material
- SPAM to the class
- Online flaming
- Offensive language
- For more information, please visit [http://www.usc.edu/student-affairs/SJACS/](http://www.usc.edu/student-affairs/SJACS/)

THE LEVEL OF TECHNOLOGY AND OF TECHNICAL COMPETENCE WILL BE REQUIRED OF THE STUDENT:

- Online DEN system.
- Primavera P6 will be taught.
- MS Word, MS Excel, and MS PowerPoint will be utilized. Students MUST have a working knowledge of windows.
- Assignments may be completed electronically and submitted via Blackboard, or printed and turned in at the start of class.