

Syllabus – CE 4220 Principles of Construction II Spring 2018

Course and Instructor Information

Course Title: Principles of Construction II **Credits:** 3
Class Time: 9:05AM-9:55AM MWF
Location: ITE 336
Instructors: Dr. Jin Zhu
Assistant Professor
CEE Department, UConn
Office: CAST 329
Office Tel: (860)486-0489
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Office hours: 1:00PM-2:00PM MWF or by appointment
Course Website (HuskyCT): <<http://huskyct.uconn.edu/webct/entryPageIns.doweбct>>

Course Description

CE 4220 is an advanced level course built upon CE 3220. This course focuses on techniques and methods in addressing the time, cost, productivity, and decision-making challenges in construction engineering and management. Topics to be covered include: advanced scheduling, construction sequencing, economic analysis, financial management, construction equipment and methods, risk management, and introduction to building information modeling.

Course Objectives

Upon successful completion of this class, students will be able to:

1. Make schedules for construction projects considering resource requirements and constraints
2. Arrange the order of tasks/activities in construction projects to optimize performance measures
3. Conduct economic analysis in construction for various decision making purposes
4. Interpret and utilize financial information of construction companies in making decisions
5. Select and manage construction equipment
6. Understand and deal with risks in construction
7. Learn the basics of building information modeling

Topics

The major topics of this course include:

1. Advanced Scheduling and Sequencing
 - Resource-related scheduling
 - Linear construction scheduling
 - Monte Carlo based scheduling
 - Construction sequencing
2. Economic and Financial Management
 - Economic analysis
 - Project cash flow
 - Accounting methods and transactions
3. Construction Equipment and Methods
 - Earthwork planning
 - Equipment power requirement
 - Equipment type, operation, and productivity
4. Risk and Uncertainty in Construction Projects
 - Risk management
 - Decision making under uncertainty
5. Introduction to Building Information Modeling

Prerequisite

CE 3220 Principles of Construction I

Course Materials

Recommended Textbook:

Daniel W. Halpin, Bolivar A. Senior, Gunnar Lucko. (2017). Construction Management, 5th edition. Wiley. ISBN: 9781119256809.

Additional materials (extra readings, homework assignments and solutions) will be distributed on HuskyCT.

Course Requirements and Grading

| Components | Weight | Requirements |
|---------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Homework | 20% | <p>Six assignments will be given and collected on the dates indicated on the Course Calendar. Homework will be posted on HuskyCT. Each assignment is collected at the beginning of the class on the due date. <i>No late submission will be accepted.</i> It is expected that homework is printed neatly or typed. Illegible homework will be considered incomplete. The top 5 out of 6 homework grades will be counted for the overall homework score.</p> <p>For each homework problem, students will receive ½ credit for attempting the problem and showing their steps to arrive at the solution, and ½ credit for arriving the correct answer. Solutions will be discussed in class.</p> |
| Group Project | 20% | In this group project, you and your group members will work together to develop a proposal/business plan for addressing one or several significant challenges construction companies are facing. Refer to “Term Project Guide” for detailed requirements and information. |
| Mid-term Exam | 30% | There will be a mid-term exam on March 21. The exam will include multiple choice questions and problems. |
| Final Exam | 30% | The final exam is scheduled during April 30 to May 5. Check HuskyCT for a final date and time as we near final exam week. The final exam will be cumulative with more emphasis on contents covered after the mid-term exam. The exam will include multiple choice questions, short answer questions, and problems. |

Grading Scale:

| Grade | Letter Grade | GPA |
|--------|--------------|-----|
| 93-100 | A | 4.0 |
| 90-92 | A- | 3.7 |
| 87-89 | B+ | 3.3 |
| 83-86 | B | 3.0 |
| 80-82 | B- | 2.7 |
| 77-79 | C+ | 2.3 |
| 73-76 | C | 2.0 |
| 70-72 | C- | 1.7 |
| 67-69 | D+ | 1.3 |
| 63-66 | D | 1.0 |
| 60-62 | D- | 0.7 |
| <60 | F | 0.0 |

Feedback and Grades

I will make every effort to provide feedback and grades. To keep track of your performance in the course, refer to My Grades in HuskyCT.

Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. This section provides a brief overview to important standards, policies and resources.

Student Code

You are responsible for acting in accordance with the [University of Connecticut's Student Code](#). Review and become familiar with these expectations. In particular, make sure you have read the section that applies to you on Academic Integrity:

- [Academic Integrity in Undergraduate Education and Research](#)

Cheating and plagiarism are taken very seriously at the University of Connecticut. As a student, it is your responsibility to avoid plagiarism. If you need more information about the subject of plagiarism, use the following resources:

- [Plagiarism: How to Recognize it and How to Avoid It](#)
- [Instructional Module about Plagiarism](#)
- [University of Connecticut Libraries' Student Instruction](#) (includes research, citing and writing resources)

Copyright

Copyrighted materials within the course are only for the use of students enrolled in the course for purposes associated with this course and may not be retained or further disseminated.

Adding or Dropping a Course

You must officially drop a course through the [Student Administration System](#) to avoid receiving an "F" on your permanent transcript. Simply discontinuing class or informing the instructor you want to drop does not constitute an official drop of the course. For more information, refer to the:

- [Undergraduate Catalog](#)

Academic Calendar

The University's [Academic Calendar](#) contains important semester dates.

Students with Disabilities

Students needing special accommodations should work with the University's [Center for Students with Disabilities \(CSD\)](#). You may contact CSD by calling (860) 486-2020 or by emailing csd@uconn.edu. If your request for accommodation is approved, CSD will send an accommodation letter directly to your instructor(s) so that special arrangements can be made. (Note: Student requests for accommodation must be filed each semester.)

Course Calendar (Tentative)

| Week | Lecture | Date | Topic | Assignment |
|-------------|----------------|-------------------|------------------------------------------------------------------------------|--------------------------------------|
| 1 | 1 | Friday, Jan 19 | Course Introduction and Team Building Activity | |
| 2 | 2 | Monday, Jan 22 | Advanced Scheduling: Resource Allocation | |
| | 3 | Wednesday, Jan 24 | Advanced Scheduling: Resource leveling | |
| | 4 | Friday, Jan 26 | Advanced Scheduling: Time Cost Tradeoff I | HW#1 Assigned |
| 3 | 5 | Monday, Jan 29 | Advanced Scheduling: Time Cost Tradeoff II | |
| | 6 | Wednesday, Jan 31 | Advanced Scheduling: Linear Scheduling | Schedule for Term Project Due |
| | 7 | Friday, Feb 2 | <i>Exercise Class</i> | |
| 4 | 8 | Monday, Feb 5 | Monte Carlo Based CPM | HW#1 Due |
| | 9 | Wednesday, Feb 7 | Construction Sequencing I | HW#2 Assigned |
| | 10 | Friday, Feb 9 | Construction Sequencing II | |
| 5 | 11 | Monday, Feb 12 | Economic Analysis in Construction | |
| | 12 | Wednesday, Feb 14 | Economic Analysis Methods I | HW#2 Due |
| | 13 | Friday, Feb 16 | Economic Analysis Methods II | |
| 6 | 14 | Monday, Feb 19 | Economic Analysis Methods II | HW#3 Assigned |
| | 15 | Wednesday, Feb 21 | Economic Analysis Methods II | |
| | 16 | Friday, Feb 23 | Financial Management in Construction | |
| 7 | 17 | Monday, Feb 26 | Project Cash Flow | HW#3 Due |
| | 18 | Wednesday, Feb 28 | <i>Jobsite Visit: Rec Center</i> | |
| | 19 | Friday, Mar 2 | Comparison of Payment Schemes I | |
| 8 | 20 | Monday, Mar 5 | Comparison of Payment Schemes II | |
| | 21 | Wednesday, Mar 7 | Snow Day (No Class) | |
| | 22 | Friday, Mar 9 | No Class | Group Project Presentation I (Video) |
| 9 | 23 | Monday, Mar 12 | No Class | |
| | 24 | Wednesday, Mar 14 | No Class | |
| | 25 | Friday, Mar 16 | No Class | |
| 10 | 26 | Monday, Mar 19 | <i>Guest Lecture: Construction Estimating (Chief Estimator from Turner)</i> | |
| | 27 | Wednesday, Mar 21 | Mid-term Exam | |
| | 28 | Friday, Mar 23 | Mid-Term Exam Review | Term Project Report I Due |
| 11 | 29 | Monday, Mar 26 | Accounting Method and Transactions I | |
| | 30 | Wednesday, Mar 28 | Accounting Method and Transactions II | |
| | 31 | Friday, Mar 30 | Power Requirements of Mobile Equipment I | HW#4 Assigned |
| 12 | 32 | Monday, Apr 2 | Power Requirements of Mobile Equipment II (video) | |
| | 33 | Wednesday, Apr 4 | <i>Guest Lecture: Construction Accounting (Project Engineer from Turner)</i> | |
| | 34 | Friday, Apr 6 | Power Requirements of Mobile Equipment III | |
| 13 | 35 | Monday, Apr 9 | Construction Equipment: Dozers | HW#4 Due |
| | 36 | Wednesday, Apr 11 | Construction Equipment: Scrapers | |
| | 37 | Friday, Apr 13 | Construction Equipment: Excavators | HW#5 Assigned |
| 14 | 38 | Monday, Apr 16 | Construction Equipment: Cranes and Lifting Equipment | |
| | 39 | Wednesday, Apr 18 | Group Project Presentation II | |
| | 40 | Friday, Apr 20 | <i>Jobsite Visit (New York)</i> | Complete Term Project Report Due |
| 15 | 41 | Monday, Apr 23 | Risk Management in Construction I | HW#5 Due/ HW#6 Assigned |
| | 42 | Wednesday, Apr 25 | Risk Management in Construction II | |
| | 43 | Friday, Apr 27 | <i>Jobsite Visit: Tunneling Project</i> | HW#6 Due |

The course calendar is a tentative plan. The professor reserves the right to make changes in the calendar. Students will be notified in advance if any changes will be made. Students should always refer to the latest version of the syllabus that will be available electronically on HuskyCT.