Part I Course Organization

Professor Henry M. Koffman, PE
KAP 222
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Office Hours: By Appointment

TA:       ImanYadegaran
          KAP 239
          Email : iyadegar@usc.edu

Office Hours:
            Tuesdays  12-2 PM
            Wednesdays 12-2 PM

Class: MONDAY 6:30 – 9:10 in GFS 116

Blackboard: http://blackboard.usc.edu

WEEK 1
1/14 Introduction/Industry/Project/Overview
Lecture: Chapter 1: The Construction Industry
First Class Quiz

WEEK 2
1/21 No Class
Martin Luther King Day – University Holiday
WEEK 3
1/28  Speaker Guest: Jay Fischer – Catalina Project

Lecture:  Chapter 2:  Business Ownership  
          Chapter 3:  Company Organization

Autobiographies due [Past, Present, Future] Include Recent Color Picture

Homework #1 Due:  Chapter 1: #1-18

WEEK 4
2/4  Homework #2 Due:  Chapter 2: #1, 3, 9-11, 22-24  
     Chapter 3: #1, 4, 5, 8

Ethics Group #1 Presentation

Quiz #1:  Chapters 1-3 [Closed Book]

2/6-2/9  SPARKS

2/10  Chinese New Year [Year of the Snake]

WEEK 5
2/11  Lecture:  Chapter 4:  Drawings & Specifications  
      Chapter 5:  Estimating & Bidding  
      Chapter 6:  Construction Contracts

Ethics Group #2 Presentation

WEEK 6
2/18  No Class  
     President’s Day – University Holiday
WEEK 7
2/25  Lecture:  Chapter 7:  Contracts Surety Bonds
     Chapter 8:  Construction Insurance

Homework #3 Due:  Chapter 4:  #1, 3, 4, 8, and 9
                  Chapter 5:  #1, 4, 6, 12, 17 – 19, 25, 27, 28
                  Chapter 6:  #2, 5, 8 –10, 13, 15, 16

Videos

Ethics Group #3 Presentation

Take-home quiz Unbalancing (due on 3/4)

WEEK 8
3/4  Lecture:  Chapter 9:  Business Methods
     Chapter 10:  Project Management & Administration

Ethics Group #4 Presentation

Homework #4 Due:  Chapter 7:  #1, 4, 5, 7-9
                  Chapter 8:  #1-13
Unbalancing take-home quiz due

WEEK 9
3/11  MIDTERM:  Chapters 1-8 [Closed Book]

TERM PAPER TOPICS DUE

WEEK 10
3/18-3/22  Spring Break
WEEK 11
3/25  Lecture:  Chapter 13: Labor Law
         Chapter 14: Labor Relations

Homework #5 Due: Chapter 9: #1-6
         Chapter 10: #1, 2, 4-9, 12-14

Ethics Group #5 Presentation

WEEK 12
4/1  Lecture: Chapter 11 Project Time Management

Homework #6 Due: Chapter 13: #1, 3, 4, 7-10
         Chapter 14: #3, 4-8, 11-14

Ethics Group #6 Presentation

QUIZ #3 Chapter 11 [take home]

4/2  Symposium #19 @ Town & Gown

4/4-4/6  ASCE PSWRC @ USC/LMU

WEEK 13
4/8  Lecture:  Chapter 12  Project Cost Management
         Chapter 15  Safety

Homework #7 Due:  Chapter 11: #1, 4-10

QUIZ #3 Due

Ethics Group #7 Presentation
WEEK 14
4/15   Homework #8 Due:  Chapter 12: #1 – 7
       Chapter 15: #2-4, 6, 7, 12-14

TERM PAPER DUE!
PAPER/ORAL PRESENTATIONS

WEEK 15
4/22   PAPER/ORAL PRESENTATIONS

WEEK 16
4/29   Class/Teacher/TA/ABET Evaluations
       PAPER/ORAL PRESENTATIONS

WEEK 17
5/6    No Class
       Stop Day

WEEK 18
5/13   7 – 9 PM    FINAL [closed book]    Chapters 9-15

Friday, 5/17   COMMENCEMENT
POLICIES

Examinations:
All examinations will be closed book. Notes will not be allowed. Make-up examinations will be given under extraordinary circumstances only. Missed quizzes will count as zero if prior authorization is not granted. Honor system is observed.

Grading/Values:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Grade Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Participation and Homework</td>
<td>10%</td>
<td>A- to A+ = &gt;90%</td>
</tr>
<tr>
<td>Midterm</td>
<td>30%</td>
<td>B- to B+ = &gt;80% or “Weighted Curve”</td>
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<tr>
<td>Final</td>
<td>30%</td>
<td>C- to C+ = &gt;70%</td>
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<tr>
<td>Paper and Oral Presentations</td>
<td>15%</td>
<td>D- to D+ = &gt;60%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>15%</td>
<td>F &lt; 59%</td>
</tr>
</tbody>
</table>

**Note:** Quizzes cannot be made up without prior authorization from the Professor. Missed quizzes will count as a zero.

Course Content:
A. Objectives:
1. Fulfill degree requirements.
2. Become familiar with Construction Management/Methods.
3. Understand the principles of project management, cost/schedule/methods/terminology, contract administration.
4. Skill development for successful job performance, especially communications, both written and verbal.
5. Ethics comprehension.
6. Teamwork

B. Outcomes:
1. Construction Management Fundamentals
2. Unbalancing
3. Critical Path Method
4. Written Communications
5. Oral Communications
6. Ethics

C. Homework and Paper Submission:
Please be punctual in submitting your home works and term paper. Homework assignments must be submitted by the date specified on this syllabus before the class starts. I will be flexible as long as I feel the reasons are valid and are not excessive. Unexcused late homework will not be accepted. You should submit your homework 1) on paper or 2) through the online link on blackboard under the assignment. These links will be set for each homework assignment separately. Please do not email your homeworks and do not use digital Dropbox to submit your homeworks. The homeworks submitted online, will be graded online. Term
paper should be submitted through the Turnitin Software. For more information about Turnitin, please refer to term paper section in this syllabus.

D. **Instructions:**
1. Includes reading assignments, lectures, example problems, homework, examinations, a term paper, an oral presentation and field trips.
2. Intention in lecture is to: focus on key ideas, work example problems, leaves less important detail for reading and question asking.
3. Students will be expected to fully participate in classroom discussions and problem solving.
4. Industry speakers will present their views and opinions.
5. Tardiness will not be tolerated.
6. Absences are only excused with prior notification via e-mail and/or telephone. Three (3) unexcused absences will result in a failure grade.
7. Cell phones, pagers, etc. must be turned off.

E. **Reading Assignments**
1. Reading Assignments are identified on the course agenda.
2. It is important to keep up with the reading since it will form the basis for classroom discussions.

F. **Extra Credits:**
1. Extra Papers
2. Professional organizational activities and membership in ASCE, AGC, CMAA, etc.
3. Field trips
4. Seminars, Symposia, Conferences, etc. (Symposium #17, ASCE PSWRC, SPARKS Competition, ASCE Student Leadership Conference, etc.)

G. **Student Conduct**
1. Students are Responsible for adhering to “Academic Responsibility.”
ACADEMIC RESPONSIBILITY

“Students, faculty, and administrative officials at the University of Southern California, as members of the academic community fulfill a purpose and a responsibility.

The University must, therefore, provide an optimal learning environment, and all members of the University community have a responsibility to provide and maintain an atmosphere of free inquiry and expression. The relationship of the individual to this community involves these principles: Each member has an obligation to respect:

1. THE FUNDAMENTAL HUMAN RIGHTS OF OTHERS
2. THE RIGHTS OF OTHERS BASED UPON THE NATURE OF THE EDUCATIONAL PROCESS
3. THE RIGHTS OF THE INSTITUTION

ACADEMIC DISHONESTY

The following statements and examples explain specific acts of academic dishonesty.

1. Examination Behavior: Any use of external assistance during an exam is considered academically dishonest unless expressly permitted.
   a. Communicating in any way with another student during the examination.
   b. Copying material from another student’s exam.
   c. Using unauthorized notes, calculators or other devices.

2. Fabrication: Any intentional falsification or invention of data or citation in an academic exercise will be considered a violation of academic integrity.
   a. Inventing or altering data for a laboratory experiment or field project.
   b. Resubmitting returned and corrected academic work under the pretense of grader evaluation error, when, in fact the work has been altered from its original state.

3. Plagiarism: Plagiarism is the theft and subsequent passing off of another’s ideas or words as one’s own. If the words or ideas of another are used, acknowledgement of the original source must be made through recognized referencing practice.
   a. Direct Quotation: Any use of a direct quotation should be acknowledged by footnote citation and by either quotation marks or appropriate indentation and spacing.
   b. Paraphrase: If another’s ideas are borrowed in whole or in part and are merely recast in the student’s own words, proper acknowledgement must, nonetheless, be made. A footnote or proper internal citation must follow the paraphrase material.

4. Other Types of Academic Dishonesty:
   a. Submitting a paper written by another;
   b. Using a paper or essay in more than one class without the instructor’s express permission;
   c. Obtaining an advance exam copy without the knowledge or consent of the instructor;
   d. Changing academic records outside of normal procedures;
   e. Using another person to complete a homework assignment or take-home exam without the knowledge and consent of the instructor.

The above information is taken directly from the SCampus and the Academic Affairs Unit of the Student Senate in conjunction with the Academic Standards Committee.
## APPENDIX A: ACADEMIC DISHONESTY
### SANCTION GUIDELINES

<table>
<thead>
<tr>
<th>VIOLATION</th>
<th>RECOMMENDED SANCTION (assuming first offense)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copying answers from other students on exam.</td>
<td>F for course.</td>
</tr>
<tr>
<td>One person allowing another to cheat from his/her exam or assignment.</td>
<td>F for course for both persons.</td>
</tr>
<tr>
<td>Possessing or using extra material during exam (crib sheets, notes, books, etc.)</td>
<td>F for course.</td>
</tr>
<tr>
<td>Continuing to write after exam has ended.</td>
<td>F or zero on exam.</td>
</tr>
<tr>
<td>Taking exam from room and later claiming that the instructor lost it.</td>
<td>F for course and recommendation for further disciplinary action (possible suspension).</td>
</tr>
<tr>
<td>Changing answers after exam has been returned.</td>
<td>F for course and recommendation for disciplinary action (possible suspension).</td>
</tr>
<tr>
<td>Fraudulent possession of exam prior to administration.</td>
<td>F for course and recommendation for suspension.</td>
</tr>
<tr>
<td>Obtaining a copy of an exam or answer key prior to administration.</td>
<td>Suspension or expulsion from the University; F for course.</td>
</tr>
<tr>
<td>Having someone else take an exam for oneself.</td>
<td>Suspension or expulsion from the University for both students; F for course.</td>
</tr>
<tr>
<td>Plagiarism.</td>
<td>F for course.</td>
</tr>
<tr>
<td>Submission of purchased term papers or papers done by others.</td>
<td>F for course and recommendation for further disciplinary action (possible suspension).</td>
</tr>
<tr>
<td>Submission of the same term papers to more than one instructor where no previous approval has been given.</td>
<td>F for both courses.</td>
</tr>
<tr>
<td>Unauthorized collaboration on an assignment.</td>
<td>F for the course for both students.</td>
</tr>
<tr>
<td>Falsification of information in admission application (including supporting documentation).</td>
<td>Revocation of university admission without opportunity to apply.</td>
</tr>
<tr>
<td>Documentary falsification (e.g., petitions and supporting medical documentation).</td>
<td>Suspension or expulsion from the university; F for course when related to a specific course.</td>
</tr>
<tr>
<td>Plagiarism in a graduate thesis or dissertation.</td>
<td>Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.</td>
</tr>
</tbody>
</table>

Please refer to Trojan Integrity: A Faculty Desk Reference, for more information on assessing sanctions. You may also consult with members of the Office of Student Judicial Affairs and Community Standards at any point in the process, (213) 740-6666.

Note: The Student Conduct Code provides that graduate students who are found responsible for academic integrity violations may be sanctioned more severely than Appendix A suggests.
“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 the TA) as early in the semester as possible. DSP is located in STU 301 and is open early, 8:30 am – 5:00 pm, Monday through Friday. The number for DSP is (213) 740-0776.”
1. Partnering
2. Total Quality Management or QA/QC
3. Termination of a Public Contract
4. Robotics in Construction
5. Construction Safety
6. Starting Your Own Construction Company
7. Privatization
8. Your company has just been awarded a $2.5 billion contract to construct a concrete dam in China. You have been Project Manager in charge and you must develop actions and/or plans to organize and manage the Project.
9. Define a major problem confronting the construction industry today. Elaborate on solutions.
11. The future trend of Construction Management as a business
12. BIM
15. Mechanic Lien Changes
16. IPD [Integrated Project Delivery]
17. Limited Liability Company, Corporations & Chapter S Corporations
18. Data Mining and Analysis in Engineering
19. What are the benefits of continuing professional development? For engineering projects, what are the ethical responsibilities of the engineer to provide sustainable development?
20. Pros and Cons of CPM and other innovative methods to manage construction schedules.
23. Sustainability – LEED
24. Needed changes in engineering curriculum [pick a major]
25. Diversity in the Construction industry.
26. Construction Productivity
27. Lean Construction
28. Construction Bonds & Insurance
29. Public financing for construction projects.
30. PPP [Private Public Partnership] with PPP case studies.
31. Females in the construction industry.
32. Design/Build
33. Infrastructure in California
34. American Construction companies on the global stage.
35. Construction factor in Real Estate Development.
36. Alternate Disputes Resolution
37. Construction Supply Chain Management
38. How to improve building life cycle performance
39. The impact of ergonomic factors in construction industry.
40. Nanotechnology in construction industry
41. The philosophy of construction management
42. Challenges and Opportunities in building energy consumption
43. Prefabrication and mass customization
44. Self-chosen topic upon approval of Professor Koffman
45. Construction of Stadiums
46. Green Skyscrapers
47. Offshore Construction
48. Green alternative construction techniques
49. Bridge construction safety
50. US Highway Construction
51. Case study on World Trade Center
52. Nanostructures and Nano materials in Construction
53. Construction time management
54. Panama Canal
55. International Construction
56. Cost differences between LEED and normal construction
57. Different construction methods for bridges
58. Major problem confronting the construction industry
59. Define "Green"
60. How is a good “place” created through a construction development
61. New Los Angeles Expo line
62. Farmer’s Field project
63. Earth sheltering
64. LEED certified projects
65. Construction industry in different regions of the world
66. Crime, Corruption and Construction
67. Construction automation and visualization
68. Construction of the golden gate bridge, Bay Bridge or other famous structures
69. Experiences and Challenges of a private contractor
70. Construction projects in Dubai
71. Modular construction
72. Self-Sustaining, "Off The Grid" Buildings
73. California High-Speed Rail Project
74. Sustainable methods in engineering and architecture industry
75. Comparing the construction industry between China and US
76. Large commercial ships
Term Paper Submission

USC is committed to the general principles of academic honesty that include and incorporate 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.

By taking this course, students are expected to understand and abide by these principles. Projects for this course may be subject to an originality review as performed by Turnitin technologies (http://www.turnitin.com) to find textual similarities with other Internet content or previously submitted student work. Students of this course retain the copyright of their own original work, and Turnitin is not permitted to use student-submitted work for any other purpose than (a) performing an originality review of the work, and (b) including that work in the database against which it checks other student-submitted work.
CE 460
Spring 2013

Research Papers Organization

1. Title Sheet
   a. Title
   b. Author(s)
   c. Date
   d. Course Number

2. Abstract or Executive Summary

3. Text
   a. Introduction
   b. Body
   c. Conclusion

4. Acknowledgements

5. References and/or Footnotes

10-12 pages, double space
Lower academic performance: The following health factors are associated with lower academic performance on at least one assignment (based on the 2000 Health Survey):

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percent affecting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>37.1</td>
</tr>
<tr>
<td>Sleep difficulty</td>
<td>27.1</td>
</tr>
<tr>
<td>Relationship problems</td>
<td>21.2</td>
</tr>
<tr>
<td>Depression</td>
<td>18.6</td>
</tr>
<tr>
<td>Family concerns</td>
<td>18.4</td>
</tr>
<tr>
<td>Internet and game-playing</td>
<td>16.0</td>
</tr>
<tr>
<td>Alcohol</td>
<td>7.5</td>
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</tbody>
</table>
KEYS FOR SUCCESS

1. FUN. Be passionate; Enjoy what you are doing; Must love product and work; Everyone is able to tell if you are enjoying what you are doing. If you are not having FUN, then you are doing the wrong type of work.

2. FOCUS. Be committed to your work. Focus your energy on ideas and enjoyment of work.

3. CREATIVE. Not stopping at your assignment, but taking it one step beyond. Offering more than asked for, maybe that extra smile, or extra attention.

4. PRIDE. Self esteem.

5. ENTHUSIASM. Let everyone know how terrific things are going. Toot your own horn and let others toot theirs. Give individual thank yous, and give honest positives in a timely fashion.
INSTRUCTOR’S CODE OF ETHICS

I will constantly be aware of all learning styles and adapt to the class to meet those leaning needs using a variety of teaching methods.

I will create an environment in the class that will encourage the greatest opportunity for learning.

I will strive to continuously improve my skills as an instructor, trainer and teacher.

Emergency Training Institute
STUDENT’S CODE OF ETHICS

I will take responsibility for my own learning.

I agree to be an active participant in my quest for new knowledge and skills.

I will participate in the evaluation process in an honest manner.

I will not interfere with the learning of others.

Emergency Training Institute
ENGINEERING-IN-TRAINING (EIT/FE) EXAM

DEADLINE FOR FILING AND EXAM DATES:

<table>
<thead>
<tr>
<th>SPRING 2013 Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>April 2012 Final Filing Dates:</strong></td>
</tr>
<tr>
<td>Final Filing Date for New PE/PLS Applications</td>
</tr>
<tr>
<td>Final Filing Date for PE/PLS Refiles and all FE/FS (EIT/LSIT) Applications</td>
</tr>
<tr>
<td><strong>April 2012 Examination Dates:</strong></td>
</tr>
<tr>
<td>FE/FS (EIT/LSIT) Exams</td>
</tr>
<tr>
<td>NCEES PE Exams</td>
</tr>
<tr>
<td>- Chemical</td>
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<tr>
<td>- Civil</td>
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<tr>
<td>- Electrical</td>
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<tr>
<td>- Mechanical</td>
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<tr>
<td>Principles of Surveying (PS)</td>
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<tr>
<td>NCEES Structural 16 hour Exam</td>
</tr>
<tr>
<td>California Land Surveying Exam</td>
</tr>
<tr>
<td>Special Civil Exams: Seismic Principles and Engineering Surveying</td>
</tr>
</tbody>
</table>

**Notes:**
- Schedule is subject to change in accordance with Board Rule 436(c).
- Applications must be postmarked by the final filing date in accordance with Board Rule 422(a).
- Effective October 2011 exam administration, postponement requests will not be processed for any NCEES PE, FE (EIT) or FS(LSIT) examination or the California Geotechnical exam.
- If you are applying for licensing in California you must apply in accordance with California statutes and regulations, schedules and deadlines. The California Board does not honor NCEES or other state’s deadlines for submitting applications.
- All Civil PE applicants must comply with the posted final filing dates as they are required by law to take and pass the Special Civil Exams.
- The Board does not allow extensions of the final filing dates pending notification of the FE/EIT and FS/LSIT exam results, or exam appeal results.
- * Dates for the Spring 2013 California Seismic Principles, Engineering Surveying and Land Surveying exams will be posted as soon as they are available.

FOR MORE INFORMATION:
California State Board Registration for Professional Engineers and Land Surveyors
PO Box 349002
2535 Capitol Oaks Drive, Suite 300
Sacramento, CA 95833-2944
Phone: 916-263-2222 Fax: 916-263-2246
BPEL_Office@dca.ca.gov
Website: www.dca.ca.gov/pels

NOTE: STUDY BOOKS ARE AVAILABLE AT THE XE + AGC + ASCE OFFICE – KAP 241
ALL CIVIL ENGINEERING STUDENTS ARE URGED TO TAKE THIS EXAM NOW!!
Student Stress Calendar*

This calendar is meant to give you an idea of the stresses that many college students will be dealing with throughout the school year.

**September**
- **Homesickness**: Especially fresh people
- **Values crisis**: Students are confronted with questions of conscience in areas of drugs, alcohol, experimentation, morality, religion, and social expectations.
- Feelings of inadequacy and inferiority develop due to the discrepancy between high school status, grades and initial college performance.
- **“In Loco Parentis Blues”**: Students feel depressed because of real or perceived restrictive policies and regulations of college.
- International students sense confusion, vulnerability, and lack of any advocate in power position.
+ Students’ excitement and willingness to try new things is at a peak.

**October**
- Fresh people realize that college life is not as perfect as expectations led them to believe. Old problems seem to continue and new ones are added.
- Grief develops because of inadequate social skills for finding a group or not being selected by one.
- Mid-term work pressure accumulates, followed by feelings of failure and loss of self-esteem.
- Sexual conflicts and confusion begin to show a result of first time confrontation with different heterosexual and homosexual standards.
- Non-dating students feel a loss of esteem because of societal pressures. Dating students may feel pressure to perform.
- Panic about finding a job strikes mid-year graduates.

**November**
- Academic pressure mounts due to procrastination, difficulty of work, and lack of ability.
- Depression and anxiety increase since students feel they should have adjusted to college by now.
- Party blues for students who have not found a social group.
- **Economic anxiety**: Loans are due and summer finances have now dwindled.
- Some students cease to make attempts at new friendships beyond and existing two or three superficial relationships.
+ Mid-term break provides relief.

*Source Unknown*
Student Stress Calendar (cont’d)

**December**
- Extracurricular time strain: Seasonal parties, concerts, dances, projects, etc.
- Anxiety, fear, and guilt as final examinations approach and papers are due.
- Pre-holiday depression: Those who have no home to visit; those who prefer not to go home.
- Financial strain because of holiday gifts and travel expenses.
- Vacation strains dating relationships.
+ Excitement is up because of season and vacation.

**January**
- Post holiday blues.
- Classes begin again.
- Less daylight hours.
+ Academic pressures are less.

**February**
- Vocational choice causes anxiety and depression.
- Depression increases for those who have failed to establish social groups.
- Social calendar is not active and weather is blah.
+ Transfer students and fresh people have survived the semester.
+ Energy is high because students see the end of the year in sight.

**March**
- Drug and alcohol use increase.
- Depression increases due to anticipated separation from friends and loved ones at college.
- Academic pressures increase – Midterm panic.
+ Spring is coming; weather improves.

**April**
- Frustrations and confusions develop during registration for the next semester.
- Papers and exams mount up.
- Time is extremely full with end of the year banquets, job interviews, award ceremonies, etc.
+ The end is in sight and motivation arises to finish out the school year.

**May**
- End of the year anxiety over leaving friends and facing conflicts at home.
- Senior panic about jobs and ability to finance oneself.
+ Euphoria over completing one year of college/graduating.
+ Friendships solidify as people face having to be separated over the summer.
Part II  Detailed Course Objectives
### CE 460

**Construction Engineering**

**3 Units**

USC | SONNY ASTANI DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

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**Course Information, Textbook, and Supplementary Materials**

**Course Description:** Introduction to the construction processes; estimating and bidding, construction administration, planning and scheduling, equipment and methods, labor relations, cost control systems, and safety.

**Required for:** BSCE Structural  **Elective for:** BSCE and BSCE Building Science

**Prerequisite:** none

**Co-Requisite:** none


**Reference:** none

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<table>
<thead>
<tr>
<th>Topics Covered</th>
<th>Learning Outcomes</th>
</tr>
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<tbody>
<tr>
<td>Development of professional skills</td>
<td>Students will have learned:</td>
</tr>
<tr>
<td></td>
<td>1. Site safety</td>
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<td></td>
<td>2. Labor law and labor relations</td>
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<td>3. Project cost management</td>
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<td>4. Project time management</td>
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<td>5. Business methods</td>
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<td>6. Bonds and insurance</td>
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<td>7. Cost estimating and bidding</td>
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<td>8. Drawings and specifications</td>
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<td>9. Company organization</td>
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<td>10. Business ownership</td>
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<td>11. The construction company</td>
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<td>12. Construction contracts and law</td>
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<td>13. Ethics</td>
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<td>14. To research, organize, and write a technical paper</td>
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<td>15. To prepare and orally present a technical paper</td>
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<tr>
<td>Ethics</td>
<td>16. To differentiate various ethical behaviors</td>
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<tr>
<td>Networking</td>
<td>17. To learn various codes of ethics</td>
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<td>18. How to join professional organizations (AGC, ASCE, etc.)</td>
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<td>19. About opportunities to attend professional conferences, meetings, symposia, etc.</td>
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<td></td>
<td>20. About professional registration</td>
</tr>
<tr>
<td>Principles of Construction</td>
<td>21. Construction vocabulary</td>
</tr>
<tr>
<td>Management and Methods</td>
<td>22. Critical path method</td>
</tr>
<tr>
<td></td>
<td>23. Unbalancing</td>
</tr>
<tr>
<td></td>
<td>24. The construction process</td>
</tr>
</tbody>
</table>

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Lecture and Lab Schedule

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sessions per Week</td>
<td>Duration per Session</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Contribution of Course to Meeting the Professional Component

Engineering Topics
In this course, students will further develop their professional skills and networking capabilities, understand the importance of ethics along with the principles of construction management and methods.

Relation of Course Objectives to Program Outcomes

The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.

This course contributes to the program outcomes as outlined in the adjacent table.

<table>
<thead>
<tr>
<th>Course Contribution to Program Outcomes (a-k)</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. An ability to apply knowledge of mathematics, science, and engineering.</td>
<td></td>
</tr>
<tr>
<td>d. An ability to function on multi-disciplinary teams.</td>
<td>✓</td>
</tr>
<tr>
<td>e. An ability to identify, formulate and solve engineering problems.</td>
<td></td>
</tr>
<tr>
<td>f. An understanding of professional and ethical responsibility.</td>
<td>✓</td>
</tr>
<tr>
<td>g. An ability to communicate effectively.</td>
<td>✓</td>
</tr>
<tr>
<td>h. The broad education necessary to understand the impact of engineering solutions in a global economic and environmental and societal context.</td>
<td></td>
</tr>
<tr>
<td>i. Recognition of the need for, and an ability to engage in life-long learning.</td>
<td></td>
</tr>
<tr>
<td>j. Knowledge of contemporary issues.</td>
<td></td>
</tr>
<tr>
<td>k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.</td>
<td></td>
</tr>
</tbody>
</table>

Prepared by: Henry M. Koffman, P.E.
Director, Construction Engineering and Management Program

Semester: Spring 2013