The University of Texas at Austin

ARE 323K - Project Management and Economics
Fall 2003

Syllabus

UNIQUE NUMBER: 13540

INSTRUCTOR: Dr. Carlos H. Caldas
ECJ 5.206
Phone: 471-6014 Fax: 471-3191
e-mail: caldas@mail.utexas.edu
http://www.ce.utexas.edu/prof/caldas/

TIME: Tuesday and Thursday – 11:00AM-12:30PM

PLACE: CPE 2.204

OFFICE HOURS: Tuesday and Thursday – 1:30PM-3:00PM or by appointment.

GRADER: David Grau (dut@mail.utexas.edu)

WEB PAGE: You will find the online materials for this course at the Blackboard web site at:
http://www.utexas.edu/cc/blackboard/index.html

COURSE CATALOG DESCRIPTION:

Solving economic problems related to construction and engineering; construction project management techniques; characteristics of construction organizations, equipment, and methods.

PREREQUISITE:

Mathematics 408D.

COURSE OBJECTIVES:

This course will introduce the principles of construction project management and engineering economic analysis. To address these subjects, the course covers a substantial amount of material. Two textbooks are used, and we will cover most of their content.

The objectives of this course are: (1) to introduce the students to the fundamentals of construction project management including the project management process, construction contracts, and project delivery methods; (2) to describe the methodologies used for project cost estimating and scheduling; (3) to demonstrate the application of project control techniques; (4) to introduce concepts of engineering economic analysis such as economic decision making, engineering costs, and time value of the money; (5) to present analytical methods including present worth analysis, cash flow analysis, rate of return analysis, incremental analysis, sensitivity analysis, and replacement analysis; and (6) to describe depreciation methods and the calculation of income taxes.
TEXTBOOKS (REQUIRED):


TOPICS:

PART I – CONSTRUCTION PROJECT MANAGEMENT
1. Introduction; Construction Industry and the Project
2. Project Management Process
3. Contracts and Project Delivery Methods
5. Cost Estimating: Conceptual
7. Cost Estimating: Detailed
8. Project Scheduling: Fundamentals
9. Project Scheduling: Network Construction
10. Project Scheduling: Activity Duration & Network Calculations
11. Project Controls: Fundamentals
12. Project Controls: Cost, Schedule, and Resource
13. Project Controls: Updating the Project

PART II – ENGINEERING ECONOMIC ANALYSIS
14. Economic Decisions
15. Engineering Costs
16. Interest and Equivalence
17. Interest Formulas
18. Present Worth Analysis
19. Annual Cash Flow Analysis
20. Rate of Return Analysis
21. Incremental Analysis
22. Sensitivity and Breakeven Analysis
23. Depreciation
24. Income Taxes
25. Replacement Analysis

GRADING:

Grade components will be weighted as follows in the computation of the final course grade:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

The correspondence of letter grade to numerical grade is:

A: grade ≥ 90
B: 80 ≤ grade < 90
C: 70 ≤ grade < 80
B: 60 ≤ grade < 70
F: grade < 60
COURSE/INSTRUCTOR EVALUATIONS:

Each student will be given the opportunity to evaluate the course using the standard course/instructor evaluation form (MEC form) during the last week of classes. Feedback from students will be requested throughout the semester.

POLICIES:

Exams and Homework Assignments: All exams are closed book, closed notes. The midterm exam will cover topics 1 to 13. The final exam will be comprehensive. The instructor reserves the right to adjust letter grades, upward only, based on individual attendance and class participation if the numerical grade warrants such consideration. Exams will include material covered in reading assignments and class discussions. Exam make-up’s will be given only in the event of a verified emergency or doctor-verified sickness. The student is responsible for all reading assignments and class handouts whether or not covered in class or listed on the syllabus. Ten homework problem sets will be assigned. All assignments are due at the beginning of the period assigned and those turned in late will count off 10% per day. (no exceptions!—except those listed for the test make-up). My goal is to return all exams and homework assignments to students within two course-weeks from the date submitted.

Class Participation and Attendance: Regular attendance is expected and encouraged. Each student is responsible for all material and administrative instructions given during the lecture period. Attendance will be observed and will become a consideration for borderline grade cases.

Personal Problems: If you have illness or personal problems that will affect your performance during the course of the semester, please let me know as soon as possible. “After the fact” provides little protection unless there are extreme circumstances. I have an answering machine, a fax machine and an e-mail address if you need to get in touch with me after hours. Do not hesitate to use them.

Academic Honesty: IMPORTANT! Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from The University. Since dishonesty harms the individual, all students, and the integrity of The University, policies on scholastic dishonesty will be strictly enforced. (See General Information, The University of Texas at Austin, 2001-2002, Appendix C, Subchapters 11-801 and 11-802, Student Standard of Conduct (see http://www.utexas.edu/student/registrar/catalogs/gi00-01/app/appc11.html). Remember, individual assignments are not group projects and do not build on the efforts of others without due reference.

Students with Disabilities: The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Services for Students with Disabilities area of the Office of the Dean of Students at 471-6259 as soon as possible to request an official letter outlining authorized accommodations. For more information, contact that Office, or TDD at 471-4241, or the College of Engineering Director of Students with Disabilities at 471-4321.

Privacy – Web Based Class Sites: Web-based, password-protected class sites may be associated with all academic courses taught at the University. Syllabi, handouts, assignments and other resources are types of information that may be available within these sites. Site activities could include exchanging email, engaging in class discussions and chats, and exchanging files. In addition, electronic class rosters will be a component of the sites. Students who do not want their names included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1. For information on restricting directory information, see: http://www.utexas.edu/student/registrar/catalogs/gi00-01/app/appc09.html.

Dropping the Class:
Undergraduate Students: From the 1st through the 4th class day, an undergraduate student can drop or add a course on ROSE or TEX. From the 5th through the 12th class day, a student can drop through ROSE or TEX; adds must be done in the department offering the course. For any drops beginning with the 13th class day, a student must initiate the drop process in the office of the Dean (ECJ 2.200). Departmental advisor and instructor approval may be required.
Graduate Students: From the 1st through the 4th class day, graduate students can drop or add a course on Rose or TEX. Beginning with the 5th class day, graduate students must initiate any adds or drops in their department. Graduate students can drop a class until the last class day with permission from the departmental Graduate Advisor and the Dean. Graduate students with GRA/TA/Grader positions or with Fellowships may not drop below 9 hours in a long session.

Computer Usage: Students are expected to be proficient on a personal computer and to be able to use word processing and spreadsheet programs such as Word and Excel. Familiarity with the Civil Engineering Learning Resources Center (LRC) is assumed. The web-based UT Blackboard system will be used extensively to coordinate class assignments and disseminate course information, including class notes.

IMPORTANT DATES:

No classes on November 27 due to Thanksgiving holiday. September 12 is the last day to drop a class for a possible refund. September 24 is the last day to drop a class without a possible academic penalty. October 22 is the last day to change the course to/from credit/no credit or pass/fail. December 5 is the last day a graduate student may, with the approval of the instructor, the graduate adviser, and the graduate dean, drop a course.

Midterm: Tuesday, October 21
Final Exam: Saturday, December 13, 2 – 5 PM, room TBA

SCHEDULE:

<table>
<thead>
<tr>
<th>Week</th>
<th>Lect.</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>DUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Aug 28</td>
<td>Introduction; Construction Industry and the Project</td>
<td>Gould Ch.1</td>
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<tr>
<td>2</td>
<td>2</td>
<td>Sep 2</td>
<td>Project Management Process</td>
<td>Gould Ch.2</td>
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<tr>
<td>3</td>
<td>3</td>
<td>Sep 4</td>
<td>Contracts and Project Delivery Methods</td>
<td>Gould Ch.3</td>
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<td>4</td>
<td>4</td>
<td>Sep 9</td>
<td>Cost Estimating: Fundamentals</td>
<td>Gould Ch.4</td>
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<td>5</td>
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<td>Sep 11</td>
<td>Cost Estimating: Conceptual</td>
<td>Gould Ch.5</td>
<td>HW1</td>
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<tr>
<td>6</td>
<td>6</td>
<td>Sep 16</td>
<td>Cost Estimating: Assemblies</td>
<td>Gould Ch.6</td>
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<tr>
<td>7</td>
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<td>Sep 18</td>
<td>Cost Estimating: Detailed</td>
<td>Gould Ch.7</td>
<td>HW2</td>
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<td>8</td>
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<td>Sep 23</td>
<td>Project Scheduling: Fundamentals</td>
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<td>10</td>
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<td>Sep 30</td>
<td>Project Scheduling: Act. Duration &amp; Net. Calculations</td>
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<td>Project Controls: Fundamentals</td>
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<td>HW4</td>
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<td>Project Controls: Cost, Schedule, and Resource</td>
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<td>Oct 9</td>
<td>Project Controls: Updating the Project</td>
<td>Gould Ch.13</td>
<td>HW5</td>
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<td>Integrated Project Controls</td>
<td>readings</td>
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<td>15</td>
<td>15</td>
<td>Oct 16</td>
<td>Economic Decisions</td>
<td>Newnan et al. Ch.1</td>
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<td>Oct 21</td>
<td>MIDTERM EXAM</td>
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<td>Newnan et al. Ch.2</td>
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<td>11</td>
<td>18</td>
<td>Oct 30</td>
<td>Interest Formulas</td>
<td>Newnan et al. Ch.3</td>
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<td>Present Worth Analysis</td>
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<td>Annual Cash Flow Analysis</td>
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<td>14</td>
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<td>Nov 11</td>
<td>Rate of Return Analysis</td>
<td>Newnan et al. Ch.6</td>
<td>HW7</td>
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<td>15</td>
<td>22</td>
<td>Nov 13</td>
<td>Incremental Analysis</td>
<td>Newnan et al. Ch.7</td>
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<td>16</td>
<td>23</td>
<td>Nov 18</td>
<td>Sensitivity and Breakeven Analysis</td>
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<td>Depreciation</td>
<td>Newnan et al. Ch.9</td>
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<td>18</td>
<td>25</td>
<td>Nov 25</td>
<td>Income Taxes</td>
<td>Newnan et al. Ch.10</td>
<td>HW9</td>
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<td>26</td>
<td>Dec 2</td>
<td>Replacement Analysis</td>
<td>Newnan et al. Ch.12</td>
<td>HW10</td>
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<td>27</td>
<td>Dec 4</td>
<td>Course Review</td>
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