

Instructor: Michael Fairchild, AIA

SPRING 2010

COURSE SYLLABUS

The University of Texas at Arlington

College of Engineering

Department of Civil Engineering

CE 3310 – Construction & Value Engineering

(3 Credit Hours)

Name of Instructor: Michael Fairchild, AIA, LEED® AP

Office Number: 265 Engineering Laboratory Building

Office Telephone Number: 817-247-4371 cell

Email Address: michaelf@uta.edu

Office Hours: Tuesday and Thursday, 4:50 PM to 5:30 PM, or by appointment

Course Number, Section Number, and Course Title:

- Section 001 (Class Code 21102) - **Room 203 Nedderman Hall**
CE 3310 – Construction & Value Engineering

Time and Place of Class Meetings: Tuesday and Thursday, 3:30 PM to 4:50 PM

Teaching Assistant (TA): TBD

Description of Course Content: This course covers the principles of construction engineering and decision making processes, review of the U.S. construction industry, quantity takeoff and cost estimating, scheduling and project controls, simple and compound interest calculations, equivalence, present worth, uniform annual cost, rate of return, equipment depreciation and replacement, plus competing projects.

Student Learning Outcomes: Upon completion of the course, the student will:

- Understand the dynamic nature of the U.S. construction industry and its impact on the U.S. economy.
- Recognize the principles of construction engineering and their effect on the construction decision making process.
- Know the principles of engineering decision making and how they interface with construction methodology.
- Comprehend the construction process and product delivery methods through the study of project controls, construction documents, cost estimating, bidding, construction agreements, scheduling and construction administration.
- Develop critical thinking skills and analytical judgment related to construction economics through the application of interest calculations, present worth, equivalence, uniform annual cost, rate of return, depreciation and equipment replacement costs.
- Analyze the purpose, structure and importance of value engineering in the design, construction and facility management processes, and develop critical thinking skills regarding the evaluation of alternative materials, equipment and methods involved in construction.
- Grasp the intent and purpose of building codes and green building initiatives.
- Develop insight into the practical applications of engineering principles through presentations by local professionals in the engineering, architecture and legal fields.

Specific Course Objectives:

- Demonstrate the interaction and influences of engineering principles and decision making with the construction process and product delivery.
- Present the Value Engineering Process and the interfacing of construction economic principles leading to life cycle costing decisions.
- Present financial aspects of engineering projects and the decision making process.

Requirements: Grade of C or better in CE 2313; grade of C or better in either CE 3301 or IE 3301, or concurrent enrollment.

Required Textbooks and Other Course Materials: Construction Contracting, A Practical Guide to Company Management, Seventh Edition, by Richard H. Clough, Glenn A. Sears and S. Keoki Sears, published by John Wiley & Sons, Inc. WebCT will be used for course management.

Descriptions of major assignments and examinations with due dates: There will be three exams (two during the semester and one final which will be comprehensive), and 8 homework assignments. See the Tentative Course Outline on Pages 4 & 5 for specific dates.

Grading Policy: Grades will be determined according to the following scale (the grading scale may be lowered at the discretion of the instructor, but will not be raised):

Grade	% Required
A	90 -100
B	80-89
C	70-79
D	60-69
F	Less than 60

Students will be required to accumulate points from the following:

Homework Assignments	15%	
Class Attendance & Participation		15%
Daily Quiz		15%
Hourly Exam (2)	25%	
Final Exam (Comprehensive)		30%
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Total		100%

Attendance Policy: Students are expected to attend all classes. For total professional development, class participation and oral discussions will be encouraged. Everyone is asked to arrive on time and be seated promptly for duration of class to minimize the disruption to others.

Drop Policy: Students need to consult UTA Web site for information on the university drop policy.

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 - The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled *Americans with Disabilities Act (ADA)*, pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at www.uta.edu/disability. Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

Academic Integrity: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Series 50101, Section 2.2)

Student Support Services Available: The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabi. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. Classes are held as scheduled during this week and lectures and presentations may be given.

Librarian to Contact:

Barbara R. Howser
Librarian
UT Arlington Science & Engineering Library
Mailing address: 702 Planetarium Place, Arlington, TX 76019
Phone: 817.272.7519
Email: howser@uta.edu

E-Culture Policy: The University of Texas at Arlington has adopted the University email address as an official means of communication with students. Through the use of email, UT-Arlington is able to provide students with relevant and timely information, designed to facilitate student success. In particular, important information concerning registration, financial aid, payment of bills, and graduation may be sent to students through email.

All students are assigned an email account and information about activating and using it is available at www.uta.edu/email. New students (first semester at UTA) are able to activate their email account 24 hours after registering for courses. There is no additional charge to students for using this account, and it remains active as long as a student is enrolled at UT-Arlington. Students are responsible for checking their email regularly.

Laptop use in the classroom: In order to minimize distraction, the use of laptop in the classroom is NOT allowed.

Cell Phone Policy: All cell phones must be off in class and no texting allowed during class.

Grade Grievance Policy: Refer to UTA Catalog.

Assignment Policy:

Homework and/or class assignments, class attendance, quizzes, exams and the project are important segments of this course. **Homework and/or class assignments are taken at the beginning of the class and due at the stated date on the course outline.** Points will be subtracted for late assignments. No credit after the solution is given or maximum one week late of any assignments.

- Students, who copy homework, will receive a grade of zero (0) for those assignments and will not make good grades on the tests.
- For full or partial credit, you need to show all calculations in an organized, logical, and orderly manner. Please **write legibly, draw diagrams and underline your answers.** Type the questions and the answers for essay questions. Specify problem statements (information given), what is required, and the solution for each problem. Draw the necessary diagram(s). Show all the units during your calculations and with your answers. No partial or full credit if you do not show all of your work.
- Fold your assignment in half and put your name, course number, assignment #, date submitted and Problem #'s on the back.
- Use good quality paper, such as engineering graph paper with no spiral edges.
- Write on only one side of the paper.
- Either pen or pencil is acceptable.
- Include your name, section, and page number (e.g. 1/3 means Page 1 of 3 Pages) on each sheet.
- Staple all pages together in the upper left corner.
- Neatly box all answers, and include appropriate units for numerical answers.
- Show all work (e.g. no work means no credit will be given).

NOTE: If the above guidelines are not followed, the Grader will either reject the assignment outright, for extreme cases, or deduct points for items that do not conform to the specifications.

Exam Policy

- Students, who talk during the exam or quiz, look at each other's papers, or exchange materials, their exam and quiz paper will be marked and their file will be submitted to the Office of Dean of Engineering for appropriate action.
- You need to organize all their course notes, graded homework and lab assignments, and previous exams in a binder for a fast and quick reference.
- Periodic class exercises and/or quizzes may be given in the lecture period. You should bring the text, a calculator and engineering paper to every class period.
- During the exams and quizzes, you need to be AT LEAST one seat apart.

Make-up Exam Policy: All students must take the final exam. Only extenuating circumstances will be accepted as excuse for missing the exam. Health related excuses require medical reports and the signature of a physician that provided treatment.

CE 3310 – Construction & Value Engineering

TENTATIVE COURSE OUTLINE

Day	Date	Topic	Text Reference	Assignments
Week 1				
Tuesday	January 19	Introduction to CE 3310		
Thursday	January 21	The U.S. Construction Industry	Chapters 1, 2, 3,13, 14 & 15	Review Chapters
Week 2				
Tuesday	January 26	Principles of Construction Engineering & Engineering Decision Making Process	<u>Design Matters</u> , James Armstrong, 2008	Read Chapter 2
Thursday	January 28	The Construction Process & Delivery Methods	Chapter 6	Read Chapter, Answer Questions 1,2,3,5,6,10
Week 3				
Tuesday	February 2	Project Controls	Chapters 10 &12	Read Chapters, Answer Questions: Chp. 10 – 1,5,12,14; Chp. 12 – 3,4,6
Thursday	February 4	Scheduling Techniques	Chapter 11	Read Chapter, Answer Odd No. Questions
Week 4				
Tuesday	February 9	Construction Documents	Chapter 6 & Appendix C	Read Chapter & App. C, Define “Construction Documents” & List
Thursday	February 11	GUEST SPEAKER / Building Information Modeling – Vincent Hunter, AIA		
Week 5				
Tuesday	February 16	Estimating & Quantity Takeoffs	Chapter 5	Read Chapter, Answer Questions 3,4,5,6,7,10
Thursday	February 18	Bidding the Work	Chapter 5	Read Chapter, Answer Questions 11,12,13,16,20,28
Week 6				
Tuesday	February 23	Construction Agreements	Chapters 6, 7, 8, 10 & Appendices A & L	Review Chapters & App.'s, List Major Topics
Thursday	February 25	GUEST SPEAKER / Litigation Attorney – Mitch Milby, Esq.		
Week 7				
Tuesday	March 2	Review for Exam No. 1		
Thursday	March 4	EXAM No. 1		

Day	Date	Topic	Text Reference	Assignments
Week 8				
Tuesday	March 9	Construction Administration	Appendices A & C	Review Documents, List Duties of Engineer/Architect
Thursday	March 11	GUEST SPEAKER / Structural Engineer – Mike Powell, P.E.		
Week 9				
Tuesday	March 16	SPRING BREAK		
Thursday	March 18	SPRING BREAK		
Week 10				
Tuesday	March 23	Project Close-Out	Appendices A & C	Review, List 5 activities of Close-Out & Describe
Thursday	March 25	Value Engineering	Chapter 6, VE Project	Read Chapter, Define VE, Note Examples
Week 11				
Tuesday	March 30	Simple & Compound Interest Calculations	VE Project	Hand-out Problems
Thursday	April 1	Present Worth & Uniform Annual Cost	VE Project	Hand-out Problems
Week 12				
Tuesday	April 6	Rate of Return	VE Project	
Thursday	April 8	Depreciation & Equipment Replacement	Chapter 9	Read Chapter, Answer Questions 4,5
Week 13				
Tuesday	April 13	Equivalence & Competing Projects	VE Project	Hand-out Problems
Thursday	April 15	Review for Exam No. 2		
Week 14				
Tuesday	April 20	EXAM No. 2		
Thursday	April 22	Green Building - LEED® v.3.0 2009	USGBC's <u>Green Building Design & Construction</u>	Visit Website, List 7 Credit Categories
Week 15				
Tuesday	April 27	GUEST SPEAKER / Life Cycle Sustainability Economics, Dr. Melanie Sattler, Ph.D., P.E.		
Thursday	April 29	Building Codes	International Building Code (IBC)	Visit Website, List Chapters & Subjects
Week 16				
Tuesday	May 4	Final Exam Review		
Thursday	May 6	Final Exam Review		
Week 17				
Tuesday	May 11	FINAL EXAM		