

Instructor: Michael Fairchild

FALL 2017

COURSE SYLLABUS

The University of Texas at Arlington

College of Engineering

Department of Civil Engineering

CE 3311 & AREN 3311 – Construction Engineering

(3 Credit Hours)

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

Office Number: 426 Nedderman Hall

Office Telephone Number: 817-272-0650

Email Address: michaelf@uta.edu

Office Hours: Monday-Thursday 12:30 PM until 2:30 PM & Friday 8:00 AM until 9:45 AM

Course Number, Section Number, and Course Title:

CE & AREN 3311 – Construction Engineering

- Sections 001, Woolf Hall, Room 404
- Sections 101, Off Web

Time and Place of Class Meetings: Monday, Wednesday & Friday, 10:00 AM to 10:50 AM

Teaching Assistant (TA):

Description of Course Content: Principles of construction engineering and the project management process, value engineering, specifications, different construction contracts and delivery methods, estimating and scheduling fundamentals and project control, and management of construction process. Prerequisite: Grade of C or better in [IE 2308](#) and Permission of the CE Chair or Admission to the CE Professional Program.

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.
- Develop the ability to analyze and interpret data for analysis of engineering economy alternatives and construction scheduling data.
- Advance their ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. In particular, economical analysis and construction safety are covered in the course, plus construction sustainability.
- 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 project management process and product delivery.
- Estimating Fundamentals
- Scheduling Fundamentals, network construction, activity duration and network calculations.
- Fundamentals of Project Control, cost and schedule performance, Resource Control
- Present financial aspects of engineering projects and the decision making process.

Requirements: Consent of Professor Dr. Najafi or instructor.

Recommended Textbooks and Other Course Materials: Managing the Construction Process, Estimating, Scheduling, and Project Control by Frederick E. Gould, Fourth Edition, Pearson, Prentice Hall, 2012; AIA Document A-201, "General Conditions of the Contract for Construction", 2017 Edition, published by the American Architects of America (on Blackboard)

Descriptions of major assignments and examinations with due dates: There will be two exams (one close to midterm and one final which will be non-comprehensive), one project, and several homework and lab assignments. See Course Outline 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:

Participation	15%
Homework	15%
Hourly Exams (2)	40%
<u>Final Exam (Comprehensive)</u>	<u>30%</u>
Total	100%

Make-up Exam Policy: All students must take the exams. 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.

Grade Grievance Policy: Refer to UTA Catalog for more information.

Attendance: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor for this course, I will take attendance for each class. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](#), [major-based learning centers](#), developmental education, [advising and mentoring](#), personal counseling, and [federally funded programs](#). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

Engineering Librarian:

Sylvia George-Williams, Engineering Librarian

UT Arlington Science & Engineering Library

Mailing address: B03B Nedderman Hall, Arlington, TX 76019. Phone: (817) 272 7519, Email: sylvia@uta.edu

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: for semester-long courses, 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 syllabus*. 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. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Laptop use in the classroom: In order to minimize distraction, the use of laptop and/or any other digital device (except standard scientific calculators) in the classroom is NOT allowed.

Emergency Exit Procedures: (Applies to face-to-face courses only.) Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, look for illuminated EXIT signs. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

CE/AREN 3311 – Construction Engineering

TENTATIVE COURSE OUTLINE

Day	Date	Topic	Reference	Assignments Due
Week 1				
Friday	August 25	Overview of Course & Objectives		
Week 2				
Monday	August 28	Construction Industry	Chapter 1	Answer questions 1-10 on p. 21
Wednesday	August 30	Engineering Principles & Decision Making	On Blackboard	Define: AHP, The Vision, Engineering Design Principles
Friday	September 1	Project Mgmt. Process	Chapter 2	Answer questions 1-10, p. 37
Week 3				
Monday	September 4	LABOR DAY HOLIDAY		
Wednesday	September 6	Value Engineering	Chapter 2	Define VE
Friday	September 8	Project Closeout	Chapter 2	List major steps
Week 4				
Monday	September 11	Facility Management	Chapter 2	List types of budgets
Wednesday	September 13	Contracts & Delivery Methods	Chapter 3	Answer questions 1-10, p. 54
Friday	September 15	General Conditions	Chapter 3	
Week 5				
Monday	September 18	AIA A201	On Blackboard	List major articles
Wednesday	September 20	Estimating	Chapter 4	Answer questions 1-10, p. 73
Friday	September 22	Estimating	Chapters 5 & 6	Answer Odd Number questions, p. 97 & Even Number question on p. 129
Week 6				
Monday	September 25	Estimating	Chapter 7	Answer questions 1-10, p. 150
Wednesday	September 27	Bidding	On Blackboard	Answer question
Friday	September 29	Scheduling	Chapter 8	Answer questions 1-10, p. 168
Week 7				
Monday	October 2	Scheduling	Chapter 9	Answer even numbered questions on p. 182
Wednesday	October 4	Scheduling	Chapter 10	Answer questions 1-5 on p. 195
Friday	October 6	GUEST SPEAKER: Attorney		
Week 8				
Monday	October 9	REVIEW FOR EXAM #1		
Wednesday	October 11	EXAM #1		
Friday	October 13	Project Controls	Chapter 11	Answer questions 1-10, p. 208

Week 9				
Monday	October 16	Cost, Schedule & Resource Control	Chapter 12	Answer questions 1-10, p. 235
Wednesday	October 18	Updating Project Controls	Chapter 13	Answer questions 1-10, p. 259
Friday	October 20	Project Controls 2	On Blackboard	
Week 10				
Monday	October 23	Interest Calculations	Handout on Blackboard	Answer questions on homework sheet
Wednesday	October 25	Economic Equivalence	Handout on Blackboard	Answer questions on homework sheet
Friday	October 27	Present Worth	Handout on Blackboard	Answer questions on homework sheet
Week 11				
Monday	October 30	Rate of Return	Handout on Blackboard	Answer questions on homework sheet
Wednesday	November 1	Depreciation		
Friday	November 3	Economics Homework Review		
Week 12				
Monday	November 6	2015 IBC	On Blackboard	List the major topics covered by the IBC
Wednesday	November 8	Construction Drawings	On Blackboard	List major design disciplines
Friday	November 10	Construction Drawings		
Week 13				
Monday	November 13	GUEST SPEAKER: ENGINEER		
Wednesday	November 15	OSHA	On Blackboard	List the major topics covered by OSHA
Friday	November 17	LEED	On Blackboard	List the major credit headings per LEED
Week 14				
Monday	November 20	REVIEW FOR EXAM #2		
Wednesday	November 22	EXAM #2		
Friday	November 24	THANKSGIVING HOLIDAY		
Week 15				
Monday	November 27	STUDENT PRESENTATIONS		
Wednesday	November 29	STUDENT PRESENTATIONS		
Friday	December 1	STUDENT PRESENTATIONS		
Week 16				
Monday	December 4	EXAM #1 Review		
Wednesday	December 6	EXAM #2 Review		
Friday	December 8	NO CLASS!!!		
Week 17				
Monday, Dec. 11, 8:00 – 10:30 AM		FINAL EXAM (Comprehensive) – verify date & time		

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – Michael W. Fairchild

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.