

**ARE323K PROJECT MANAGEMENT AND ECONOMICS**  
**Fall 2018 – Unique # 15030, 15035**

**INSTRUCTOR:** Dr. William J. O'Brien  
Office: ECJ 5.2  
Email: wjob@mail.utexas.edu

**MEETINGS:** T-TH 9:30-11:00 (15030); T-TH 11:00-12:30 (15035)

**OFFICE HOURS:** Monday 2:00-5:00 (subject to change) or by appointment.  
*Note 1:* I generally keep an open door policy...if the door is open, I am available.  
*Note 2:* I read email frequently but am not always able to respond right away.  
(But e-mail is a great way to reach me late at night with questions!)  
*Note 3:* If the question is of general interest, I will post the reply.

**GRADER:** Brant Mock (brantmock@gmail.com); Jong Won Ma (jwma1231@utexas.edu)

**WEBPAGE:**

Course content may be found online on Canvas at <http://canvas.utexas.edu/>

**COURSE CATALOG DESCRIPTION:**

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

**PREREQUISITES:** Mathematics 408D, CE333T

**COURSE OBJECTIVES:**

This class is an introduction to project management and economics, which in real life are closely related topics. It is hard to be a good project manager without a working knowledge of finance and cash flow. And while some people get really good at economic calculations, applying the results usually takes some project management skill, whatever the domain. As such, my two main learning objectives for the course are simple but profound:

1. Learn the basics of how a project comes together (time line, main components, participating organizations, etc.) Applications will be construction focused, but many of the ideas are generalizable.
2. Learn to be smart about money on projects (investment, budgeting, risk and decision making).

By taking this class you will be able to:

1. Define and describe the main elements in the project time and as well as the major sub-elements
2. Apply net present value and related concepts to the analysis of cash flows, including selection of alternatives and life-cycle costing (this is the big one for this class)
3. Develop elementary project schedules and perform basic scheduling calculations
4. Estimate construction costs based on square footage and quantities
5. Identify risks in each phase and apply sensitivity analysis to quantify risks in cost and time where possible/practicable.

**TEXTBOOK AND READINGS:**

NOTE: All assigned readings are required to be completed BEFORE class. As I expect you to be familiar with them, I have every right to ask you questions about the reading during class time.

There are two required textbooks for the course. The first is available at the bookstore:

- Newnan, Lavelle, and Eschenbach. (2017). *Engineering-Economic Analysis*. 13<sup>th</sup> Edition. Oxford University Press, New York/Oxford. (Note: 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> editions are ok as substitutes).

The second textbook is available free online! We will use it as a general reference.

- Hendrickson and Au. (2000/3). *Project Management for Construction*. Available at <https://www.cmu.edu/cee/projects/PMbook/>

Other reading material will be distributed on Canvas or in class.

### **GRADING:**

Grade components will be weighted as follows:

Quiz 1	05%
Midterm 1	25%
Midterm 2	25%
Final Exam	20% (seen note on optional final)
Homework	20% (individual weights vary by size of assignment)
Class Participation	<u>05%</u> (attendance)
	100%

Letter grades will be determined as follows:

A:	grade $\geq 93\%$
A-:	$90\% \leq \text{grade} \leq 92.99\%$
B+:	$87\% \leq \text{grade} \leq 89.99\%$
B:	$83\% \leq \text{grade} \leq 86.99\%$
B-:	$80\% \leq \text{grade} \leq 82.99\%$
C+:	$77\% \leq \text{grade} \leq 79.99\%$
C:	$73\% \leq \text{grade} \leq 76.99\%$
C-:	$70\% \leq \text{grade} \leq 72.99\%$
D+:	$67\% \leq \text{grade} \leq 69.99\%$
D:	$63\% \leq \text{grade} \leq 66.99\%$
D-:	$60\% \leq \text{grade} \leq 62.99\%$
F:	grade $< 60\%$

Assigned grades will strictly follow calculated scores.

### ***Exams and quizzes:***

Quizzes, midterm, and final are closed book, closed note exams. I *may* adjust scores upward if the class mean is low. Calculators are allowed provided you haven't programmed them with notes. The final will be cumulative. Other exams will cover part of the class material (subjects will be announced in class) and motivate you to review the material to-date. Exams will include problems, definition/matching, multiple choice, and short answer questions as appropriate to the material covered. This class has both quantitative and qualitative elements and both will be tested.

Quizzes, midterm and final exams will not be returned to the student. The exam solutions will be reviewed in class. Exams can be reviewed during office hours.

***Makeups exams:***

If you have an excused absence, I will work with you to take a makeup exam as close as possible to the date of the exam. If you have an excused absence that you know about ahead of time, let me know as early as possible – my preference is for you to take the exam before others. In special cases, I will work with the student on alternate accommodations.

***Homework:***

Homework consists of traditional problem sets as well as short written questions relating to the course materials and reading. All homework should be completed using the format guidelines discussed on the first day of class (example format will be uploaded on canvas for your reference). 10% will be deducted from the homework score automatically for not adhering to the format. The format is for your benefit. If the grader cannot understand your work or thought process, it can be very difficult to grade accurately. Furthermore, if only an answer is provided, with no calculations (unless appropriate to do so, such as multiple choice), the problem receives 0 credit.

Homework assignments should be completed individually, but I encourage study groups for discussion. Length of homework assignments will vary, and weighting of homework grades will vary with length and difficulty. Homework is due at the beginning of class, at 9:30am/11:00am depending on section. Late homework will not be accepted unless there is an excused absence or it has been prearranged with me.

*Written homework:* Some homework write-ups are short one page or so written assignments. There will be a write-up about every few weeks based on a short reading or response to a video. The intent is to get you thinking about broader issues related to class materials. Write-ups will be due at the beginning of class and serve as the basis of discussion. I will randomly call on an individual to start discussion by giving their answers to the write-up questions.

***Final Exam:***

This year, the final exam will be optional. Grades without the final will be posted the last week of classes (or as soon as possible to allow grading of the final homework). If you elect NOT to take the final, all class scores above will be proportionally weighted to 95% and averaged with the attendance score for 100%. If you do elect to take the final, scores will follow the table above. If you take the final exam, it will be counted toward your final grade (i.e., if you take the final and your score lowers your grade compared to not taking it, you must take the grade with the final).

***Class Participation:***

Class participation is based on attendance (see below).

**GRADE DISPUTES:**

You may dispute a grade within 5 calendar days from when the grade is posted or returned in class. Grade disputes should be submitted to me, in writing, and I will determine if the request will be granted. Do not submit re-grade requests to the grader.

When submitting grade dispute, you must put in writing (word document) what the nature of the dispute is, along with the homework/quiz to be reviewed.

If you have a grade dispute on an exam, please see me during office hours (or make an appointment) within 5 calendar days from when the graded exams were reviewed in class.

If you do not understand why you received a grade or what mistakes were made, please seek clarification. Come to office hours so we can sit down and discuss the material to ensure you understand the concepts can be as successful as possible in this course.

### **ATTENDANCE:**

Class attendance is 5% of your grade in this course and based on attendance. Attendance in this class is strongly encouraged. There is a lot of learning that goes on in the classroom, so I want students to attend and participate. As such, I will take attendance with a class roster most days (you sign by your name). If you do not want your name on this list, contact me as soon as possible to make other arrangements.

Class attendance will count towards class participation grade. Students get one unexcused absence free. After that, each unexcused absence counts as one letter grade less towards your final score for class participation. Please contact me ahead of the class if you need an excused absence (e.g., travel for job interview, student activity, etc. Family fun is NOT an excused absence). If you miss a class due to illness (or death other than your own) and were not able to contact me before class, please see me as soon as possible with evidence of your illness.

Note 1: No 'free' unexcused absences are allowed on days with guest speakers (e.g., no freebies on days when people take the time to come and speak to you!).

Note 2: extended absences without excuse are grounds for a failing grade in the course (per university policy).

**Accommodations:** If you have a long-term problem or family emergency, please talk with me about it as soon as possible so we can make mutually agreeable accommodations. It is difficult for me and generally unfair to other students if you approach me after the fact.

Accommodations will also be made for religious observance and for military duty. See the University policy here: <http://catalog.utexas.edu/general-information/academic-policies-and-procedures/attendance/>

### **EXPECTATIONS OF STUDENTS:**

This is an upper division undergraduate course. At this point, I expect you to be able to learn and assimilate materials on your own. Students are also expected to comport themselves in a professional manner. Specific expectations for students include:

1. Students should review course material on their own outside of class.
2. Students should be on time to class. It can be very disruptive to other's learning to have someone come in late. The attendance sheet will be passed around at the start of class. If you are not present to sign, you may not sign in at the end of class, unless you have already made accommodations with me *before* the class.
3. Students should participate actively in course discussions. If you need to miss class, please inform the instructor ahead of time.
4. In class, students are expected to be courteous and respectful of the views and needs of other students and instructors. Disruptive students will be asked to leave. Students are allowed to use laptops during lectures for note taking only.
5. Students will not be engaged with their cell phones (or similarly technology) in class, and cell phones will be placed on silent in a bag, or turned off. If you are on your cell phone during class, you will receive not participation credit for that class. This is YOUR time in class and I would like you to get the most out of every class.

6. Students should work on in-class assignments as if they were job assignments. At any time, the instructor may call upon students to present their work to the class.
7. Students should turn in their work on-time. In the construction industry, bids for projects are not accepted posted the deadline. Similarly, in this class, homework will not be accepted after the beginning of class on the due date.
8. If you have a family emergency or extended problem with attending class or doing homework, please contact me as soon as possible so we can accommodate your needs. It is hard to do this after the fact!

## GENERAL ADMINISTRATIVE RULES AND ANNOUNCEMENTS

### ***Course Instructor Survey:***

An evaluation of the course and instructor will be conducted at the end of the semester using the approved UT Course/Instructor evaluation forms. Feedback from students will be requested throughout the semester.

### ***Scholastic dishonesty policy:***

*You will be expected to adhere to the UT Honor Code: The core values of the University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.*

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, visit the Student Judicial Services web site <http://deanofstudents.utexas.edu/sjs/>.

In addition, see: <http://catalog.utexas.edu/general-information/appendices/appendix-c/student-discipline-and-conduct/>

Any class materials may not be uploaded onto 3rd party websites without the professor's explicit permission. If you do so, it will be considered a violation of the honor code. The professor has the right (even after the class is completed) to submit these violations to Judicial Affairs for adjudication.

### ***Students with disabilities:***

The University of Texas at Austin provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information, contact the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259 (Videophone: 512-410-6644) or <http://diversity.utexas.edu/disability/>.

### ***Office of Campus and Security:***

- Contact and further information may be found at 512-471-5767 or [www.utexas.edu/safety](http://www.utexas.edu/safety)
- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.
- In the event of an evacuation, follow the instruction of faculty or class instructors.

- Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.
- Behavior Concerns Advice Line (BCAL) 512-232-5050.
- Link to information regarding emergency evacuation routes and emergency procedures can be found at: [www.utexas.edu/emergency](http://www.utexas.edu/emergency)

### ***Counseling:***

The University of Texas at Austin maintains extensive counseling facilities for students. Resources are available at <https://cmhc.utexas.edu/>. The instructor recommends that you visit this web-site to become acquainted with the range of services available.

### ***Drop policy for long sessions:***

- Undergraduate Students - From the 1st through the 12th class day, an undergraduate student can drop a course via the web and receive a refund, if eligible. From the 13<sup>th</sup> through the university's academic drop deadline, a student may Q drop a course with approval from the Dean, and departmental advisor.
- Graduate Students - From the 1st through the 4th class day, graduate students can drop a course via the web and receive a refund. During the 5th through 12th class day, graduate students must initiate drops in the department that offers the course and receive a refund. After the 12th class day, no refund is given. No class can be added after the 12th class day. From the 13th through the 20th class day, an automatic Q is assigned with approval from the Graduate Advisor and the Graduate Dean. From the 21st class day through the last class day, graduate students can drop a class with permission from the instructor, Graduate Advisor, and the Graduate Dean. Students with 20-hr/week GRA/TA appointment or a fellowship may not drop below 9 hours.

### ***Accommodation for religious holy days:***

With notice, we will work to accommodate observance of religious holy days. The University catalog makes the following statement: "A student who misses classes or other required activities, including examinations, for the observance of a religious holy day should inform the instructor as far in advance of the absence as possible, so that arrangements can be made to complete an assignment within a reasonable time after the absence."

### ***Class web sites, use, and student privacy:***

This class will use Canvas for posting course announcements, changes to the syllabus, schedule, grades, additional reading materials, assignments, etc. I will also send messages via e-mail over the course e-mail list, which I inherit from the registrar/CLIPS. IT IS YOUR RESPONSIBILITY to make sure that address is up-to-date and an address you read frequently – and one that has space to receive messages. E-mails bounced back to me are not my responsibility. As to privacy, let me know as soon as possible if you do not want your name on class lists, etc. Students can elect to restrict their information in general university functions using this web site: <https://registrar.utexas.edu/students/records/restrictmyinfo>.

### ***Other:***

All other university policies not explicitly included on this syllabus can be found on the General Information Catalog: <http://catalog.utexas.edu/general-information/>

## SCHEDULE OF CLASS LECTURES, READINGS, AND ASSIGNMENTS

Date	Lecture Topic	Reading (Completed before class on the given date)	Assignments (Subject refers to lecture topics for the week)
8/30	Course introduction; Big Dig video		HW#1 due 9/4
9/4	Project lifecycle	Hendrickson chap 1	
9/6	Project organizations	Hendrickson chap 2	HW#2 due 9/13
9/11	Owners' perspectives / project selection & feasibility	Newnan chap 1&2 (skim); Hendrickson chap 7	
9/13	Discounting/NPV formulations	Newnan chaps 3 &4, chap 5 pp. 152-153	HW #3 due 9/20
9/18	Discount/PV examples		
9/20	Internal Rate of Return, Incremental Analysis	Newnan –chaps 7-8 (ignore appendices)	HW # 4 due 10/2
9/25	<b>Quiz 1</b> Skyscraper Video: Rock and Paper		
9/27	IRR, Incremental Analysis		
10/2	Skyscraper Video: Time and Money		
10/4	Assessing RISK	Newnan chaps 9 & 10	HW#5 due 10/1
10/9	Assessing RISK (con't)	Newnan chaps 9 & 10	
10/11	Spreadsheet exercises		Mid semester feedback due 10/15- via survey
10/16	Review		
10/18	<b>Midterm 1 (cumulative)</b>		
10/23	Depreciation	Newnan chap 11	HW#6 due 10/30
10/25	Taxes	Newnan chap 12	
10/30	Interlude: inflation and the time value of money	Newnan chap 14	
11/1	Life Cycle Costing I	Additional materials	HW#7 due 11/8
11/6	Life Cycle Costing II	Additional materials	
11/8	Estimating	Hendrickson Chap 5, RS Means	HW#8 due 11/20
11/13	Estimating		
11/15	<b>Midterm 2 (Depreciation, Taxes, LCC)</b>		
11/20	Project Scheduling	Hendrickson Chap 10	HW#9 due 11/27
11/22	<b>Thanksgiving</b>		
11/27	Project Scheduling		
11/29	Cost loading/control; schedule of values	Hendrickson Chap 12	HW #10 due 12/6
12/4	Earned value		
12/6	Course review		
12/13	<b>FINAL EXAM (Cumulative) 9:30 section – 9a-noon</b>		
12/15	<b>FINAL EXAM (Cumulative) 11:00 section – 7-10pm</b>		

This is a tentative schedule → it will change. Check the course website on Canvas for updates.

**Good luck this semester!**