ISE561-Economic Analysis of Engineering Projects
Units: 4
Fall 2024 Tuesday/Thursday 10:00 am- 11:50 am
Location: RTH 109

http://courses.uscden.net

Instructor: Dr. Shalini Gupta
Office: GER 207
Contact Info: shalinig@usc.edu
Office Hours: Thursday 4:30 pm – 5:30 pm
(Via zoom)

Teaching Assistant: TBD

Course Description
Economic evaluations of engineering systems for both government and private industry; quantitative techniques for evaluating non-monetary consequences; formal treatment of risk and uncertainty.

Student Learning Outcomes:
Students will be able to:
- determine the equivalent value of money at a specified time given the timing of deposits and interest value;
- select the most attractive interest rate in various compound and simple interest forms;
- determine if an independent investment opportunity is economically attractive;
- determine the least-cost alternative of multiple solutions in a cost comparison scenario; and
- identify the best project(s) to perform from a set of potential projects that are independently economically attractive.

Students will learn the following topics.
- Introduction to engineering economy
- Interest factors and equivalence
- Depreciation and depreciation models
- Tax considerations
- Evaluation of a single investment (including internal rate of return, net present value, cash flows)
- Revenue requirements
- Capital budgeting
- Break-even models (linear and nonlinear)
- Cost comparisons
- Decision Making Under Uncertainty

Textbooks:
- **Required Book -** Economic Analysis of Capital Expenditures for Managers & Engineers, G.T. Stevens, Jr. (ISBN13:9780536583468)

Recommended Books
- Principles of Engineering Economic Analysis, White, J.A., K.E. Case, and D.B. Pratt, 6th edition, John Wiley & Sons, Inc., 2012. (ISBN13: 978-1118163832)
- Engineering Economy, Sixth Edition, Leland blank and Anthony Tarquin ISBN13: 978-0073205342)
- Engineering Economy Ninth Edition, G.J. Thuesen and W.J. Fabrycky (ISBN13: 978-0130281289)
- Engineering Economics Jose A. Sepulveda, William E. Souder, Byron S. Gottfried (ISBN13: 978- 9780070238343)

Required Software:
- You will need Microsoft Excel for analyzing the data.

DEN and WebEx Instructions
- Each class will be conducted in person and recorded "Live" using WebEx or Zoom software.
- DEN students can access live class by clicking on the "Virtual Meetings" link located in the D2L main menu of our course homepage.
- Your microphone will initially be muted. When you want to talk, simply un-mute yourself by pressing and holding down your space bar. When you release your space bar, you will continue to be muted.
- Later in the day following class, the recording of the session will be updated to that week's D2L module.

Description and Assessment of Assignments:

Course Material: All assigned sections of the texts, plus topics discussed in lecture by the instructor.

Exams: The exams will not be comprehensive. Points will be assigned to each section of the exam. No retakes will be allowed. No make-up exam will be given. All answers should be clearly and fully justified. If the steps are unclear, points will be deducted even if the final answer is correct. All exams are open-book and open-notes. Any person caught cheating on an examination will be referred to the Office of academic integrity.

Project: The final project is a team assignment. The project will be assigned after the mid-term exam. The final project is meant to use your "Engineering Economics Knowledge" to evaluate an engineering project. The engineering project case and domain will be provided by the instructor. This project requires students to explore and understand various engineering economics techniques that are widely implemented in the assigned domain to address the economic challenges of engineering projects. For

the purpose of calculations, students need to apply equity cash flows technique, total cash flows and operating cash flows techniques. The minimum acceptable rate of returns (MARR), depreciation accounting models, estimated salvage values, and interest rates can be obtained from the library and the internet. Students are required to write a well-organized report and make an informative PowerPoint presentation. Each team must submit a 14-page report. The project is due during week 14. Additional details and instructions will be made available during the course.

Quizzes: Quizzes will address concepts and calculations related to topics covered in the previous week's classes. The specific guidelines will be posted on D2L for DEN students. Late submissions will not be accepted. Everybody must write their own solution independently and make sure to fully understand it. All answers should be clearly and fully justified. Exchanging solutions, consulting other class members, finding solutions online or elsewhere, etc. are not allowed. Violations result in losing the credit for the entire quiz set in addition to a significant percentage of the overall course grade, all with the discretion of the instructor. All quizzes are open-book and open-notes. No make-up quiz will be given.

Classroom Rules and Policies

Any form of academic dishonesty is strictly prohibited and may result in severe penalties, including suspension and expulsion. To ensure a conducive and respectful learning environment for everyone, please take note of the following guidelines and academic integrity policies:

1. **Distracting Others:** Please avoid activities that may distract your peers, such as engaging in side conversations during the class.
2. **Late Arrival or Early Departure:** It is essential to attend the entire class session. Repeatedly arriving late or leaving early without a valid reason can disrupt the flow of the class.
3. **Use of Devices:** Laptops, phones, iPads, or similar devices are not permitted during classes, exams and quizzes.
4. **Cheating or Plagiarism:** Do not engage in any form of cheating or plagiarism.
5. **Food Consumption:** Eating during class can be disruptive. Please consume food outside the classroom to maintain a focused and respectful atmosphere.
6. **Frequency of Questions:** While questions are encouraged, repeated interruptions with numerous questions may disrupt the teaching rhythm and the learning experience for others. Please consider holding questions until appropriate times or utilizing office hours for further clarification.
7. **Respectful Conduct:** Disruptive behavior will not be tolerated, and students are expected to express their views in a calm and reasonable manner. Familiarize yourself with the Academic Code of Conduct. Persistent disruptive behavior may result in disciplinary action.

8. **Attendance and Punctuality:** Attendance will be taken at every lecture. Please arrive on time and be attentive during the class.

Classroom Policies

Any form of academic dishonesty is strictly prohibited and may result in severe penalties, including suspension and expulsion. Examples of academic offenses include:

1. Falsifying data or research results.
2. Sharing quizzes/assignments.
3. Benefiting from others' work.
4. Seeking an unfair advantage.
5. External assistance during exams.
6. Possession of unauthorized materials/collaboration or devices during exams/quizzes.
7. Copying without proper citation.
8. Allowing another student to copy your work.
9. Unauthorized communication during an exam.

These guidelines are in place to ensure a fair and ethical learning environment for everyone.

To quote from a USC guidebook: "Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn, and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office of Student Judicial Affairs for disciplinary action."

Grading Breakdown

Exam 1	**20 %**
Exam 2	**20 %**
Exam 3	**25 %**
Project	**25 %**
Quizzes	**10 %**
Total	**100%**

The final grade for this course will be based on the total percentage earned in the grading breakdown shown above and will not be curved/averaged. There will not be any additional assignment substitute to improve the final grade. Also, students are encouraged to participate actively. However, there is no grade percentage assigned for active participation.

F	0
D-	60
D	63
D+	67
C-	70
C	73
C+	77
B-	80
B	83
B+	87
A-	90
A	95

Course Schedule: A Weekly Breakdown

Week	Date	Topic	Text Chapters	Deliverables
1	August 27th	Introduction and Interest	Chapter 2	No assignment this week.
1	August 29th	Interest and Interest Factors	Chapter 2	
2	Sep. 3rd	Interest and Interest Factors	Chapter 2	
2	Sep. 5th	Depreciation	Chapter 3	**(Quiz -1)**
3	Sep. 10th	Depreciation	Chapter 3	
3	Sep. 12th	Tax Considerations	Chapter 4	**(Quiz -2)**
4	Sep. 17th	Tax Considerations	Chapter 4	
4	Sep. 19th	Econ. Evaluation- a Single Pro.	Chapter 5	**(Quiz – 3)**
5	Sep. 24th	Economic Evaluation of a Single Project	Chapter 5	
5	**Sep. 26th**	**Examination 1**		
6	Oct. 1st	Economic Evaluation of a Single Project	Chapter 5	
6	Oct. 3rd	Minimum Annual Revenue Requirements	Chapter 6	**(Quiz -4)**
7	Oct. 8th	Minimum Annual Revenue Requirements	Chapter 6	
7	**Oct. 10th**	**Fall Recess**		
8	Oct. 15th	Capital Budgeting	Chapters 7	
8	Oct. 17th	Capital Budgeting	Chapters 7	**(Quiz -5)**

9	Oct. 22nd	Capital Budgeting	Chapters 7	
9	Oct. 24th	Break Even Models	Chapters 8	**(Quiz -6)**
10	Oct. 29th	Break Even Models	Chapters 8	
10	**Oct. 31st**	**Examination 2**		
11	Nov. 5th	Cost Comparisons	Chapters 9	
11	Nov. 7th	Cost Comparisons	Chapters 9	**(Quiz -7)**
12	Nov. 12th	Cost Comparisons	Chapters 9	
12	Nov. 14th	Cost Comparisons	Chapters 9	**(Quiz -8)**
13	Nov. 19th	Decision Under Uncertainty	Chapters 15	
13	Nov. 21st	Decision Under Uncertainty	Chapters 15	**(Quiz -9)**
14	**Nov. 26th**	**Project Presentations**		
14	**Nov. 28th**	**Thanksgiving Holiday**		
15	**Dec. 3rd**	**Project Presentations**		
15	**Dec. 5th**	**Examination 3**		
	Thursday, December 12	**Graded Exam 3 Review 11 a.m.-1 p.m.**		

Statement on Academic Conduct and Support Systems

Academic Integrity:
The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as

accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - 988 for both calls and text messages – 24/7 on call
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL) – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 740-0411
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.