

ENGR 155 Engineering Economic Analysis Spring 2022

Description: The application of the principles of economics to the problems of engineering is the focus of this course. During the semester, the student will be introduced to the mathematical and conceptual basis on which project analysis is built. The techniques and tools necessary for making informed financial decisions in the engineering practice will be discussed. Topics such as time value of money, interest, equivalence, cost-benefit analysis, depreciation, taxes, cash flow, and financial risk will be discussed.

Instructor: Manuchehr Shahrokhi, Ph.D.

Email: mshahrokhi@ucmerced.edu

Faculty Profile: <https://www.glofin.org/about>

[\(Links to an external site.\)](#)

Lecture Location: Zoom

<https://ucmerced.zoom.us/j/87250761015?pwd=SjR0YWl1VHB1L3BkZmFQQld1b0NpZz09>

Meeting ID: [872 5076 1015](#)

Passcode: 009146

Lecture: **Mondays & Wednesdays, 13:30-14:45 on Zoom.** See Catcourses for details

TA: Alireza Dastan – Email: adastan@ucmerced.edu

Office Hours: Thursdays 14:00 – 16:00

<https://ucmerced.zoom.us/j/81777593253>

Meeting ID: [817 7759 3253](#)

Textbook:

Newnan, T. Eschenbach, J. Lavelle, and N. Lewis; *Engineering Economic Analysis*. 14th edition; Oxford University Press, 2019.

Oxford online learning resources can be accessed through:

<https://oup.instructure.com/enroll/3XRLYD>

[\(Links to an external site.\)](#)

Once you have Learning Cloud credentials, you may log in at

<https://oup.instructure.com/>

[\(Links to an external site.\)](#)

.

Your Learning Cloud course comes prepopulated with content and assessments specifically designed to accompany Newnan, Engineering Economic Analysis 14e.

Grading: Homework assignments 10% - OUP - iCloud Learning Center - CANVAS

First exam 25%

Second exam 25%

First project review 10%

Second project review 15%

Third project review 15%

A+ = 99%-100%; A = 95%-99%; A- = 90%-95%; B+ = 87%-90%,

B = 83%-87%; B- = 80%-83%; C+ = 77%-80%; C = 73%-77%,

C- = 70%-73%; D+ = 67%-70%; D = 63%-67%; D- = 60%-63%, F = 0%-60%

Policies:

- Attendance and active participation are expected. We will discuss many details of the course live during lecture, so it is important to be present and actively participate.

- All assignments will be submitted through Canvas (OUP iCloud Platform) will be accepted.
- Late submissions will not be accepted unless in the case of an extreme circumstance properly documented to the instructor
- Catcourses will be the principal means of official communication between the instructor and the students, so be sure to check your inbox often

ENGR 155 Engineering Economic Analysis Spring 2022

Course project

- In this course, 40% of your grade will come from a group project. You will be assigned to a group and you will work with that group throughout the semester.
- The course project is inherently open-ended. Group members will have to conduct their own research to fill in any gaps in the information provided by the instructor.
- The course project will be completed in three phases, each with its own goals and expectations. We will discuss each phase in class and will define guidelines for each one.
- It is your responsibility to manage the group work. Group members will have to agree on a schedule for regular meetings, communication media (text, email, chat, etc.), roles and responsibilities for each group member, corrective measures, etc.

Learning outcomes

By the conclusion of this course, students will be able to:

- Apply the basic theory and concepts of economics to the analysis of engineering projects.
- Systematically make informed, practical, and consistent decisions when evaluating engineering projects that contain uncertainties.
- Demonstrate critical thinking when evaluating the economic aspects of different alternatives within an engineering project.
- Communicate effectively their thought process and final decisions to an audience outside of their field as well as to their peers.
- Proficiently use the mathematical tools available within MS Excel for the analysis of the economic factors of an engineering project

Academic Integrity

- All students are expected to abide by the University of California Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit ought to be the student's own work
- You are encouraged to study together and to discuss information and concepts covered in class with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, other electronic file, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be

copied will automatically receive a zero for the assignment

Students with disabilities

The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity.

ENGR 155 Engineering Economic Analysis Spring 2022

The instructor is available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are

encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Diversity and Inclusion

This class is conducted in accordance to the UC Merced Principles of Community¹, which include the recognition and celebration of all identities, values, and beliefs.

Discrimination on the basis of race, religion, sex, sexual orientation, gender identity, national origin, citizenship, documented status, or any other social identity will not be tolerated. All students are invited to discuss any situation they perceive as harmful or threatening with the instructor in class or during office hours

Course Schedule

WEEK	DATES	TOPICS - SUBJECTS
1	1/19/2022	INTRODUCTION - Chapter 1: MAKING ECONOMIC DECISIONS
2	24-Jan	Chapter 2: ENGINEERING COSTS AND COST ESTIMATING
3	31-Jan	Chapter 3: INTEREST AND EQUIVALENCE
4	7-Feb	Chapter 4: MORE INTEREST FORMULAS
5	14-Feb	Chapter 5: PRESENT WORTH ANALYSIS
6	21-Feb	Presidents Day -Chapter 6: ANNUAL CASH FLOW ANALYSIS
7	28-Feb	Chapter 7: RATE OF RETURN ANALYSIS
8	7-Mar	Chapter 8: CHOOSING THE BEST ALTERNATIVE - MIDTERM EXAM

9	14-Mar	Chapter 9: OTHER ANALYSIS TECHNIQUES
10	21-Mar	SPRING RECESS
11	28-Mar	Chapter 10: UNCERTAINTY IN FUTURE EVENTS
12	4-Apr	Chapter 11: DEPRECIATION
13	11-Apr	Chapter 12: INCOME TAXES
14	18-Apr	Chapter 13: REPLACEMENT ANALYSIS
15	25-Apr	Chapter 14: INFLATION AND PRICE CHANGE
16	2-May	Chapter 15: SELECTION OF A MINIMUM ATTRACTIVE RATE OF RETURN
17	9-May	FINAL EXAM - MONDAY MAY 9 - ONLINE