CVEEN 2300 Engineering Economics
Course Syllabus

(Last updated: August 15, 2020)

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Schedule: 2.0 Credit Hours. Online Course with Expected Completion of One Learning Module Every Week
Dr. Burian’s Office Hours: TBD (on Zoom)

Prerequisites by topic: Full Major status in Civil Engineering OR Construction Engineering.

Catalog Description: Fundamental engineering economics topics, including equivalence, compound interest and discount rate factors, nominal and effective interest rates, cash flow diagrams, capitalized cost, net present worth analysis, equivalent uniform annual cost, internal rate of return, benefit-cost analysis, basic microeconomics, cost estimation, and cost indexes.


Course Overview, Goal, and Objectives:
Engineering economics plays a central role in the decision making associated with civil engineering projects, and indeed it commonly plays a role in everyday life. To be a successful civil engineer you will need to accurately compare project alternatives using economics as a key criterion. Civil engineers, therefore, must be familiar with ways to calculate the costs of projects, compare to the benefits, and inform decisions of all types of projects – e.g., public works, industry, etc. Considering more broadly, engineering economics is a core capacity needed for all engineers. The goal of this course is to equip you with the basic knowledge, skills, and attitudes to conduct engineering economic analyses common in civil engineering practice. After completing this course, you will be able to:

1. Explain engineering economics concepts to decision makers.
2. Apply computer tools, especially Microsoft Excel, to analyze the engineering economics of a project.
3. Use factor notation and compound interest tables to organize and complete economic analyses.
4. Choose the appropriate analysis technique and apply to solve an engineering economics problem.
5. Evaluate engineering work by ethically using an economic basis.
6. Judge multidimensional projects considering a benefit/cost analysis.

Modules:
1. Making Economic Decisions
2. Engineering Costs and Cost Estimating
3. Interest and Equivalence
4. Equivalence for Repeated Cash Flows
5. Present Worth Analysis
6. Annual Worth Analysis
7. Rate of Return Analysis
8. Choosing the Best Alternative
9. Other Analysis Techniques
10. Economic Analysis in the Public Sector
Assessments:
You are responsible to complete assignments, quizzes, exams, and other learning assessments before the designated deadline. Details, submission requirements, schedules and deadlines will be provided on the course’s Canvas site.

1. Problem Assignments. Each module will include an assignment of selected problems to be solved individually and in small groups. You will be expected to solve problems manually and using computer tools. Submissions will be through Canvas.

2. Quizzes. Each module will include one or more announced quizzes focused on concepts, terms, and simple methodological steps. The quizzes will be administered through Canvas.

3. Exams. There will be exams after Module 3, Module 7, and Module 10. The exams will be cumulative up to the point they are administered, but will focus on the most recently covered material that has not been previously assessed by an exam.

4. Team Project. Teams will provide an independent cost analysis of the senior capstone design course project. Teams will work with senior students in civil engineering to analyze two or more design alternatives and provide a recommendation for selection based on economic criteria. This will be an open-ended assignments with teams selecting the appropriate methods, doing desk-research to collect the necessary data, and compiling the economic analysis in a brief report.

Performance Evaluation (Course Grade):
Overall performance evaluation (grade) will be assigned based upon the weighted sum of selected summative assessments:

Overall Grade = (Assignments Grade*10%) + (Quizzes Grade*5%) + (Exams Grade*70%) + (Project Grade*15%)

The basic rubric for performance is as follows:
- 90 – 100% Demonstrated exemplary performance beyond the minimum competency level
- 80 – 90% Demonstrated value beyond minimum competency but is lacking in completeness, accuracy, and/or professionalism
- 70 – 80% Slight added value beyond minimum competency
- <70% Lacking competency because of severe lack of completeness, accuracy, and/or professionalism

Student Responsibilities:
Though the online format allows students greater flexibility to complete their work, this course does have a structure and timeline! As such, the following is expected of all students in this class:

- Students must be self-motivated, organized, self-reliant, and willing to stay on top of their schedule. Students should take control of their learning while in this course.
- Students are expected to follow the Core Rules of Netiquette at all times while participating in the class and communicating with others.
- Students will log in to the course a minimum of 3 times per week.
- Students are not expected to interact with their classmates in person. Students may be expected to work with classmates via online communication options like Canvas Discussions, video conferencing, or another communication technologies of choice (Groupme, FaceTime, Google Hangouts, etc).
- Students will regularly check for course updates and will update their Canvas notification settings to ensure they receive timely notifications from the course.
- Students will contact their instructor or teaching assistant in a timely manner if they have any questions, are struggling with course materials, or need further assistance from their instructor.
  - If you do not hear back within 3 days after sending a message, please contact your instructor again.
• Students will follow all official University of Utah policies regarding interpersonal conduct, academic dishonesty, and other rights and responsibilities of students outlined in the University of Utah Student Handbook and Code of Student Rights and Responsibilities.
  o If you have any questions about this, please contact the Dean of Students.

Instructor Responsibilities:
Your course instructor is an expert in the topics you will learn about this semester. Your instructor is your mentor and facilitator of the classroom experience. The instructor is committed to:

• The instructor will design the course to include seminars, learning materials, and assignments that are accessible and provide students with opportunities to learn and practice course content.
• The instructor will ensure that the course remains a safe space where students can engage with difficult content thoughtfully and respectfully.
• The instructor will interact with the class regularly via announcements, virtual office hours (one-on-one video conferencing), emails/the Canvas Inbox, feedback on assignments, and comments on Discussions, among other methods.
• The instructor will respond to students in a timely manner: within 24 hours.
• The instructor will be available for individual consultation via virtual office hours (one-on-one video conferencing), email, or phone and will not require students to meet in person.
• The instructor will provide relevant feedback in a timely manner.
• The instructor will follow all official University of Utah policies regarding interpersonal conduct, accommodations, and other important duties.

COURSE POLICIES (see Canvas for a more complete listing of university policies)
Late Submission. Late submission of assignments, exams, project, and other deliverables is not accepted. If you have a circumstance arise that prevents timely submission contact the instructor immediately. Depending on the circumstances, and agreement between you and the instructor an appropriate submission timeline will be established.

Resubmission for Re-Grading. All grades are final, except in the case of a mistake made by the grader. No other revision of assignment submittals is permitted.

Authorized Aid. You must adhere to U of U policies on Academic Integrity and to the ASCE Code of Professional Ethics. Consequences for failure to adhere to those policies will follow the U of U Student Handbook and include the range of receiving a zero grade for the item in question to possible failure in the course and/or dismissal from the program/university.


The Americans with Disabilities Act. The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

University Safety Statement. The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.
Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran’s status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).