IE 301: Engineering Economics

General Information:

Term: 2021 Summer Session **Instructor: Staff** **Language of Instruction: English** **Classroom: TBA** **Office Hours: TBA**
Class Sessions Per Week: 5 **Total Weeks: 5** **Total Class Sessions: 25** **Class Session Length (minutes): 145** **Credit Hours: 4**

Course Description

This course introduces students to the basic concepts of finance, accounting, and engineering economics. Students will learn the skills to assess the costs and benefits of engineering investments, such as product and technology development programs and capital purchases. Topics covered include cost concepts, financial statements, company economic environment, analysis of time value of money, comparison of project alternatives before and after taxes, cash flows, replacement analysis, risk management, and financial cash statements.

Prerequisite: MATH 201 Calculus II.

Course Material

Engineering Economy, 17th edition, William G. Sullivanf

Course Assignments:

Quizzes

Quizzes will usually consist of True-False, multiple choice and short answer questions. Quizzes cannot be made up and will typically take 10 minutes or less. Five quizzes will be given through the whole semester.

Homework

Homework must be turned in at the specified due date prior to the beginning of class. No late assignments will be accepted. Homework assignments are to be done individually.

Project

Students will form into teams of 3-4 members and each team will be assigned a topic to work on. The group project will provide you with the opportunity to demonstrate your mastery of Engineering Economy concepts. Your project will be graded based on a class presentation, a report and a team peer rating.

Exams

There will be two midterm exam and a final exam. All exams (midterms and final) will be in class and closed book.

Course Assessment:

Quizzes	10%
Project	20%
Homework	5%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	25%
Total	**100%**

Grading Scale (percentage):

A+: 98%-100%
A: 93%-97%
A-: 90%-92%

B+: 88%-89%
B: 83%-87%
B-: 80%-82%
C+: 78%-79%
C: 73%-77%
C-: 70%-72%
D+: 68%-69%
D: 63%-67%
D-: 60%-62%
F: Below 60%

Course Schedule

Class 1:

Overview of the course;

Go through syllabus;

Self-introduction;

Students form discussion group

Class 2:

Engineering Economy Principles and Wiley Plus Tutorial;

Cash Flow Diagrams, conventions;

Single cash flows

Class 3:

Future worth;

Present worth;

Assign Team

Class 4:

Quiz 1

Kirchhoff's Laws, Dependent Sources

Multiple Cash Flows: Irregular series;

Class 5:
Uniform series of cash flows
Compounding Frequency;
Periodic Interest Rate Approach;

Class 6:
Quiz 2
Effective and nominal interest rates;
Equivalence
Interest Payments and Principal Payments;

Class 7:
Bond Investment;
Variable Interest Rates;
Annual Percentage Rates

Class 8:
Midterm Exam 1

Class 9:
Present Worth Analysis: Methods of comparing economic worth;
Present Worth Analysis: Equivalence of methods;
Ranking and incremental methods;
Project Checkpoint 1

Class 10:
Before-tax vs. After-tax analysis
Present Worth Analysis: Equal vs. Unequal lives;
A single alternative;

Class 11:

A single alternative (cont.);

Present Worth Calculations

Benefit-Cost analysis;

Class 12:

Quiz 3

Discounted Payback;

Capitalized Worth;

Class exercises, examples

Class 13:

Annual worth:

Single alternative

Multiple alternatives

Class 14:

Future worth:

Single alternative

Multiple alternatives

Class 15:

Quiz 4

Future worth:

Portfolio analysis

Class 16:

Internal Rate of Return:

Single alternative

Multiple alternatives

Class 17:

Midterm Exam 2

Class 18

External Rate of Return:

Single alternative

Multiple alternatives

Project Checkpoint 2

Class 19:

Replacement analysis;

Fundamentals;

Replacement analysis: Cash flow and opportunity cost;

Optimum replacement interval

Class 20:

Depreciation;

Straight line and declining balance;

Modified accelerated cost recovery system (MACRS)

Class 21:

Quiz 5

Income Taxes;

Corporate income taxes;

After-tax analysis using retained earnings;

After-tax analysis using borrowed capital

Class 22:

Inflation: The meaning and measure of inflation;

Before-tax analysis

Class 23:

Inflation: After-tax analysis;

After-tax analysis with borrowed capital

Project Presentation

Class 24:

Break Even, sensitivity analysis and risk analysis;

Ethics in Engineering Economy

Project Presentation

Class 25:

Wrap-up

Review for final

Final Exam (Cumulative): TBA

Academic Integrity:

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Huazhong University of Science & Technology's *Academic Conduct Code.* Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean's Office. Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.

Special Needs or Assistance:

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have

learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.