

COLLEGE OF ENGINEERING
General Engineering
GENG 360 Engineering Economics
Fall 2022

Instructor Information

Name:
Academic Title:
Office:
Phone:
E-mail:
Office Hours:

TA Information

Name:
Office:
Phone:
E-mail:
Office Hours:

Class/Laboratory Schedule

Coordinator Information

Name: Dr. Pilsung Choe
Office: Building C07- 277
Phone: 4403-6395
E-mail: pchoe@qu.edu.qa

Course Information

Catalog Description:

Principles of Engineering Economy. Equivalence and compound interest formula. Single payment model. Uniform payment model. Gradient payment model. Decision criteria for single and multiple alternatives: Present worth, annual worth, future worth, internal rate of return, and benefit cost ratio. Before and after tax analysis.

Credits:

3 Credit hours.

Contact Hours:

3 Lecture hours.

Prerequisites:

MATH 102 Calculus II

Textbook(s):

Engineering Economy, Leland Blank and Anthony Tarquin 8th Edition, McGraw-Hill, Feb-9-2017. ISBN 10: 0073523437, ISBN 13: 978-0073523439.

References:

- Principles of Engineering Economic Analysis, 5th Ed., John White, Kenneth Case, David Pratt, John Wiley and Sons, Inc., 2010.
- Fundamentals of Engineering Economics, Chan S. Park, Prentice Hall.

Course Objectives:

- Provide students with fundamental concepts of engineering economics.
- Provide students with economical methods to compare and evaluate alternatives based on present, annual, rate of return, and benefit over cost analyses.
- Emphasize practical engineering-based applications and the use of real data examples.

Course Learning Outcomes (CLOs):

1. Identify engineering projects in economic influences based on cash flows, interest rate, and project period.
2. Differentiate differences between engineering projects (independent/mutually exclusive project, public/private sector's project)
3. Formulate engineering project alternatives based on cash flows and an interest rate in a specified project period.
4. Analyze and compare engineering project alternatives based on present worth, annual worth, future worth, rate of return, B/C ratio, and/or Breakeven.

Relationship of Course Learning Outcomes (CLOs) to Student Outcomes (SOs):

Course Learning Outcomes (CLOs)	Related Student Outcomes (SOs)						
	1	2	3	4	5	6	7
1				✓			
2				✓			
3	✓						
4	✓						

Student Outcomes (SOs):

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered:

Topics	Chapter*	Section*	Weeks
Introduction: Why engineering economy? The concept "time value of money", interest rate (simple and compound), cash flow estimation & diagram.	1	1.1-1.9	1
Factors, interest tables and interpolation, gradient factors, determination of unknown IRR & N, shifted series. Nominal and effective interest rate.	2-4	2.1-2.7, 3.1-3.3, 4.1-4.3	3.5
Formulating alternatives (mutually exclusive, independent) Analysis of alternatives using PW equal/unequal lives, FW, Capitalized cost.	5	5.1-5.5	2
Midterm Exam (Week 7)			0.5
AW analysis/calculations: single project, capital recovery, permanent projects. Determine Rate of Return Analysis using PW for single project and ROR analysis using incremental PW calculations.	6-8	6.1-6.4, 7.1-7.3, 8.1, 8.2, 8.4	1.5
Use of Excel in Engineering Economy: introduction to excel functions, PW analysis, Payback period*, rate of return (IRR).	1	1.10	0.5
Benefit Cost analysis: single projects, B/C formulation, modified B/C, B- C difference, selection of alternatives using incremental B/C, use of excel in B/C analysis.	9	9.1-9.4	1
Breakeven analysis: single project, two alternatives.	13	13.1-13.2	1
Inflation: Understanding impact, inflation rate, interest rate relationship.	14	14.1-14.2	0.5
Depreciation: terminology, SL, DB, MACRS, Switching from DB to SL.	16	16.1-16.5 16A.2	1
Taxes: terminology, CFBT & CFAT. Effects of taxes: different depreciation methods, ROR. After-tax: PW, AW and ROR.	17	17.1-17.3 17.5	1.5
Final exam (TBA)			1
Total			15

*Optional

Method of Instruction

- Conventional Lectures: power point presentation and white board delivery.
- Group Class Exercises.
- Class Discussion.

Assessment Methods and Grading Policy

Homework:	10 %
Quizzes:	25 %
Midterm exam:	30 %
Final exam:	35 %

ABET Contribution of Course to Professional Component

Subject Area (Credit Hours)

College-Level Math & Basic Science:

Engineering : 3cr

Engineering Design :

Broad Education :

Computer/Software Usage

MS Excel

Laboratory Projects

N/A

Course Ground Rules

No late homework will be accepted unless you have a legible excuse acceptable to the instructor and in line with university policies. Attendance and active participation in class discussion are expected. University regulations will be applied regarding excessive absences (failure for absences over than 25% of lectures resulting in “FB”), missing of quizzes or exams, etc.

University Code of Conduct

QU expects its students to adopt and abide by the highest standards of conduct in their interaction with professors, peers, staff members and the wider university community. Moreover, QU expects its students to act maturely and responsibly in their relationships with others. Every student is expected to assume the obligations and responsibilities required from them for being members of the QU community.

As such, a student is expected not to engage in behaviors that compromise their integrity, as well as the integrity of QU. Further information regarding the University Code of Conduct may be found on the web at <http://www.qu.edu.qa/students/code-of-conduct>

Support for Students with Special Needs

It is Qatar University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Special Needs Section will exert all efforts to accommodate for individuals' needs.

Contact Information for Special Needs Section:

Tel-Female: (00974) 4403 3843
Tel-Male: (00974) 4403 3854
Location: Student Activities Building
Email: specialneeds@qu.edu.qa

Academic Support and Learning Resources

The University Student Learning Support Center (SLSC) provides academic support services to male and female students at QU. The SLSC is a supportive environment where students can seek assistance with academic coursework, writing assignments, transitioning to college academic life, and other academic issues. SLSC programs include: Peer Tutoring, the Writing Lab, Writing Workshops, and Academic Success Workshops. Students may also seek confidential academic counseling from the professional staff at the Center.

Contact Information for Students Support and Learning Resources:

Tel: (00974) 4403 3876
Fax: (00974) 4403 3871
Location: Female Student Activities Building
E-mail: learningcenter@qu.edu.qa

Student Complaints Policy

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the student handbook.

Declaration

This syllabus and contents are subject to changes in the event of extenuating circumstances. The instructor (with approval of the Head of Department) reserves the right to make changes as necessary. If changes are necessitated during the term of the course, the students will be notified by email communication and posting the notification on the online teaching tool Blackboard. It is the student's responsibility to check on announcements made while they were absent.

Faculty Name: Pilsung Choe
Last Modified: Aug 17, 2022
Date: Aug 17, 2022