

City University of Hong Kong
Course Syllabus

offered by Department of Systems Engineering
with effect from Semester A 2024 / 25

Part I Course Overview

Course Title:	<u>Engineering Economic Analysis</u>
Course Code:	<u>SYE6050</u>
Course Duration:	<u>One Semester</u>
Credit Units:	<u>3</u>
Level:	<u>P6</u>
Medium of Instruction:	<u>English</u>
Medium of Assessment:	<u>English</u>
Prerequisites: <i>(Course Code and Title)</i>	<u>Nil</u>
Precursors: <i>(Course Code and Title)</i>	<u>Nil</u>
Equivalent Courses: <i>(Course Code and Title)</i>	<u>SEEM6050 Engineering Economic Analysis (offered until 2021/22)</u> <u>ADSE6050 Engineering Economic Analysis (offered until 2023/24)</u>
Exclusive Courses: <i>(Course Code and Title)</i>	<u>Nil</u>

Part II Course Details

1. Abstract

This course aims to enable students, to understand the essentials of economic and financial analysis and apply them to financial decision-making in industrial and engineering management. Topics in engineering economics include operating and capital budgets, financial statement used by managers, replacement analysis, and cost of capital and leasing. The course will also cover analysis of financial statements with an emphasis on implications for engineering management and industrial investment analysis.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Explain the concept of social and commercial values of money.	9%	✓		
2.	Articulate the underlying principles of the financial management, and discuss the contents of financial statements.	17%		✓	
3.	Analyze the financial statements and construct investment strategies from engineering economic perspectives.	24%		✓	
4.	Describe the nature of project risk and assess the risk from a particular project.	25%		✓	
5.	Evaluate decision options from the financial and non-financial perspectives.	25%		✓	
		100%			

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Learning and Teaching Activities (LTAs)

(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lecture	The lectures covering not only the narrowly focused techniques in engineering economy but also the wider issues of the environment that affect engineering economic decision making. Students are expected to participate in class discussion when needed.	✓	✓	✓	✓	✓	39 hours/sem

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>50</u> %							
Group project-Report	✓	✓	✓	✓	✓	25%	
Group project- Presentation	✓	✓	✓	✓	✓	5%	
Case studies		✓	✓	✓	✓	10%	
Homework assignments	✓	✓	✓	✓	✓	10%	
Examination: <u>50</u> % (duration: 2 hours , if applicable)							
						100%	

The homework assignments allow the students to practise what is learned from the lectures and assess the degree of their understanding of the subject in the form of short exercises.

The case studies require the students to practise and review what is learned in the subject in a more integrative manner.

The project provides the students with hand-on practice of the subject and the experience of a real and messy engineering economical environment.

The final examination covers all the topics taught in the course.

For a student to pass the course, at least 30% of the maximum mark for the examination should be obtained.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Group project- Report	The project provides the students with hand-on practice of the subject and the experience of a real and messy engineering economical environment.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Group project- Presentation	The presentation provides the students to practise their presentation skills.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Case studies	The case studies require the students to practise and review what is learned in the subject in a more integrative manner.	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Homework assignments	The homework assignments allow the students to practise what is learned from the lectures and assess the degree of their understanding of the subject in the form of short exercises.	High	Significant	Moderate	Basic	Not even reaching marginal levels
5. Examination	The final examination covers all the topics taught in the course.	High	Significant	Moderate	Basic	Not even reaching marginal levels

The examination, homework assignments and case studies will be marked according to the respective marking schemes. The marking schemes will be designed at the time they are set. The Grades will then be awarded according to the marks attained. The group project report is graded with the following criteria:

- (i) analytic framework- the ability to conceptualize and formulate an accurate model for financial analysis, CILO3;
- (ii) data- the ability to judge the quality of the data to be collected and the ability to make estimates from the data, CILO3 & CILO4;
- (iii) findings- the ability to analyze using the appropriate analytical approach with the data and estimates, CILO4;
- (iv) conclusion- the ability to draw conclusion and make recommendations by evaluating the results of the financial analysis and the other factors relevant to the purpose of the project, CILO5 and
- (v) presentation- the ability to organize and communicate, and to achieve coherence and balance in the articulation of the project, CILO1 & CILO2.

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Group project- Report	The project provides the students with hand-on practice of the subject and the experience of a real and messy engineering economical environment.	High	Significant	Moderate/Basic	Not even reaching marginal levels
2. Group project- Presentation	The presentation provides the students to practise their presentation skills.	High	Significant	Moderate/Basic	Not even reaching marginal levels
3. Case studies	The case studies require the students to practise and review what is learned in the subject in a more integrative manner.	High	Significant	Moderate/Basic	Not even reaching marginal levels

4. Homework assignments	The homework assignments allow the students to practise what is learned from the lectures and assess the degree of their understanding of the subject in the form of short exercises.	High	Significant	Moderate/Basic	Not even reaching marginal levels
5. Examination	The final examination covers all the topics taught in the course.	High	Significant	Moderate/Basic	Not even reaching marginal levels

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- (i) analytic framework- the ability to conceptualize and formulate an accurate model for financial analysis, CILO3;
- (ii) data- the ability to judge the quality of the data to be collected and the ability to make estimates from the data, CILO3 & CILO4;
- (iii) findings- the ability to analyze using the appropriate analytical approach with the data and estimates, CILO4;
- (iv) conclusion- the ability to draw conclusion and make recommendations by evaluating the results of the financial analysis and the other factors relevant to the purpose of the project, CILO5 and
- (v) presentation- the ability to organize and communicate, and to achieve coherence and balance in the articulation of the project, CILO1 & CILO2.

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

- Definition, Concepts & Scopes of Engineering Economics.
- Time Values of Money, Present Worth, Equivalent Annual Worth.
- Investment Appraisal Techniques.
- Project risk, Sensitivity Analysis, Break-Even Analysis, Scenario Analysis

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	“Contemporary engineering economics” by Chan S. Park, 4 th ed., Upper Saddle River, N.J. : Prentice Hall, 2007
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2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	“Essentials of engineering economic analysis” by Donald G. Newnan, Jerome P. Lavelle, Ted G. Eschenbach, 2 nd ed., New York : Oxford University Press, 2002.
2.	“Finance for Non Financial Managers” by Pierre G. Bergeron, , Thomson.