SYE6050: ENGINEERING ECONOMIC ANALYSIS

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Engineering Economic Analysis

Subject Code
SYE - Systems Engineering
Course Number
6050

Academic Unit
Systems Engineering (SYE)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
SEEM6050 Engineering Economic Analysis (offered until 2021/22) / ADSE6050 Engineering Economic Analysis (offered until 2023/24)

Exclusive Courses
Nil

Part II Course Details

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.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the concept of social and commercial values of money.	9	x		
2	Articulate the underlying principles of the financial management, and discuss the contents of financial statements.	17		x	
3	Analyze the financial statements and construct investment strategies from engineering economic perspectives.	24		x	
4	Describe the nature of project risk and assess the risk from a particular project.	25		x	
5	Evaluate decision options from the financial and non-financial perspectives.	25		x	

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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	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.	1, 2, 3, 4, 5	39 hours/sem

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Group project-Report	1, 2, 3, 4, 5	25	nil	No
2	Group project-Presentation	1, 2, 3, 4, 5	5	nil	No
3	Case studies	2, 3, 4, 5	10	nil	No
4	Homework assignments	1, 2, 3, 4, 5	10	nil	No

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Additional Information for ATs

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.

Assessment Rubrics (AR)

Assessment Task

Group project-Report (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

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

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task
Group project- Presentation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
The presentation provides the students to practise their presentation skills.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Case studies (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

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

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Homework assignments (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion
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.

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

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

Excellent
(A+, A, A-) High

Good
(B+, B, B-) Significant

Fair
(C+, C, C-) Moderate

Marginal
(D) Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Group project-Report (for students admitted from Semester A 2022/23 to Summer Term 2024)

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

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Group project- Presentation (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
The presentation provides the students to practise their presentation skills.

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Case studies (for students admitted from Semester A 2022/23 to Summer Term 2024)

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

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Homework assignments (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
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.

Excellent
(A+, A, A-) High

Good

(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

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

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate/Basic

Failure
(F) Not even reaching marginal levels

Additional Information for AR
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.

Part III Other Information

Keyword Syllabus
- 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

Reading List

Compulsory Readings

	Title
1	"Contemporary engineering economics" by Chan S. Park, 4th ed., Upper Saddle River, N.J. : Prentice Hall, 2007

Additional Readings

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