

# SDSC3020: ENGINEERING ECONOMICS

---

## Effective Term

Semester A 2024/25

## Part I Course Overview

### Course Title

Engineering Economics

### Subject Code

SDSC - School of Data Science

### Course Number

3020

### Academic Unit

School of Data Science (DS)

### College/School

School of Data Science (DS)

### Course Duration

One Semester

### Credit Units

3

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

MA1503 Linear Algebra with Applications

### Precursors

Nil

### Equivalent Courses

Nil

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

The goal of the course is to equip engineering students with the proficiency needed to make economically sounds decisions, and to realize practical and affordable engineering designs, projects and solutions. We will provide students with a basic

understanding of the principles and techniques in engineering economic analysis that are needed in the decision making process. While emphasis is on the analytical consideration of money and its impact on decision making, the course also considers other factors such as social and environmental responsibilities in the economic analysis and decision process. At the end of the course students build a framework to systematically analyse the economic aspects of engineering solutions and to evaluate alternative designs by considering notions such as time value of money, economic equivalence, depreciation, tax etc.

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the underlying principles of the engineering decision making process involving cash flow.	15	x		
2	Model engineering system economic decision problems as decision options of income streams for economic analysis.	25	x	x	
3	Estimate the cash flow of a decision option.	10	x	x	
4	Apply the analytical techniques based on the concept of the time value of money to the analysis of a decision option with cash flow.	25	x	x	
5	Evaluate decision options from the financial and non-financial perspectives.	25	x	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	Lectures	Students will engage in formal lectures to gain knowledge on 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	3 hours/week

**Assessment Tasks / Activities (ATs)**

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Test	1, 2, 3	30	
2	Group project - Report	3, 4, 5	15	
3	Group project - Presentation	3, 4, 5	5	
4	Homework assignments	3, 4, 5	10	

**Continuous Assessment (%)**

60

**Examination (%)**

40

**Examination Duration (Hours)**

2

**Additional Information for ATs**

Note: To pass the course, apart from obtaining a minimum of 40% in the overall mark, a student must also obtain a minimum mark of 30% in both continuous assessment and examination components.

**Assessment Rubrics (AR)****Assessment Task**

Test

**Criterion**

The mid-term test provides students with an opportunity to reflect what they have learned and covers the topics taught before the mid-term.

**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

**Criterion**

The project provides the students with hand-on practice of the subject and the experience of a real and messy decision making 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**

Homework assignments

**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

**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

**Additional Information for AR**

The examination, test, and homework assignments 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:

- analytic framework- the ability to conceptualize and formulate an accurate model for financial analysis, CILO2;
- data- the ability to judge the quality of the data to be collected and the ability to make estimates from the data, CILO3;
- findings- the ability to analyze using the appropriate analytical approach with the data and estimates, CILO4;
- 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
- presentation- the ability to organize and communicate, and to achieve coherence and balance in the articulation of the project, CILO1.

**Part III Other Information****Keyword Syllabus**

Definition, Concepts & Scopes of Engineering Economics.  
 Time Values of Money, Present Worth, Equivalent Annual Worth.  
 Computation of Interests, Investment Appraisal Techniques.  
 Estimating cash flows.

**Reading List****Compulsory Readings**

Title	
1	Engineering Economy- Applying theory to practice, Ted G Eschenbach, 3rd Edition, 2010, Oxford University Press

**Additional Readings**

Title	
1	Contemporary Engineering Economics, Chan S Park, 6th Edition, 2015, Pearson Education
2	Engineering Economy, William G. Sullivan, Elin M. Wicks, and C. Patrick Koelling, 16th Edition, Pearson Education Limited 2014
3	Online learning material is provided via University computer network.