جامعة الشرقية
A' SHARQIYAH UNIVERSITY

# Course Descriptor
# [ENGR4001-Engineering Economics]

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| **Proposed Academic Year** | 2019-2020 | **Last Reviewed Academic Year** | Spring 2020-2021 |
| **Course Code** | ENGR4001 | **Course Title** | Engineering Economics |
| **Credit hours** | 4 | **Level of study** | Undergraduate |
| **College / Centre** | College of Engineering | **Department** | Civil & Environmental Engineering |
| **Co-requisites** | | **Pre-requisites** | |

## 1. COURSE OUTLINE

[Basics of cost analysis and accounting. Application of engineering economics to decision making. Analysis of engineering alternatives based on use of interest computations, valuations, depreciation, and cost estimates]

## 2. AIMS

[The objective of this course is to introduce the basic concepts of engineering economy and to demonstrate the importance of financial management and engineering decisions in financial project analysis. This includes an overview of financial accounting, time-value of money, risk in financial decisions, and book and tax depreciation]

## 3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

| **Learning Outcomes** ***(Definitive)*** Upon successful completion of this course, students will be able to**:** | **Teaching and Learning methods** ***(Indicative)*** | **Assessment** ***(Indicative)*** |
|---|---|---|
| **1.** Apply the basic concepts of engineering economics to a decision making process | Lectures, Tutorials; Group work and seminars; etc | Quiz, Written Examination |
| **2.** Derive and use the different engineering economy factors | Lectures, Tutorials; Group work and seminars; etc | Quiz; Written Examination |
| **3.** Evaluate investment opportunities and compare between alternatives using single and combined economic factors | Lectures, Tutorials; Group work and seminars; etc | Assignment, Written Examination |
| **4.** Perform a replacement study considering inflation and indirect cost allocation | Lectures, Tutorials; Group work and seminars; etc | Written Examination |
| **5.** Use depreciation and depletion models; perform breakeven | Lectures, Tutorials; Group work and seminars; etc | Written Examination |

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| analysis and sensitivity analysis. | | |

## 4. ASSESSMENT WEIGHTING

| Assessment | Percentage of final mark (%) |
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| Midterm 01 | 20 |
| Midterm 02 | 20 |
| Participation and assignments | 20 |
| Final Examination | 40 |
| **TOTAL** | **100%** |

## 5. ACHIEVING A PASS

Students will achieve 4 credit hours for this course by passing ALL of the course assessments and achieving a minimum overall score of 50%

NB *Ensure that ALL learning outcomes are taken into account

## 6. COURSE CONTENT (Indicative)

| LECTURE TOPIC | TIME (HOURS) |
|---|---|
| Syllabus presentation | 1.5 |
| Basic concepts of engineering economics | 1.5 |
| Simple and compound interest | 1.5 |
| Minimum Attractive rate of Return | 1.5 |
| Excel exercises | 1.5 |
| Engineering economics abbreviations and terminologies | 1.5 |
| Single payment factors | 1.5 |
| Excel exercises | 1.5 |
| Uniform series factors | 1.5 |
| Excel exercises | 1.5 |
| Arithmetic and geometric gradient factors | 1.5 |
| Hand and Excel exercises | 1.5 |
| Combining economic factors | 1.5 |
| Hand and excel exercises | 1.5 |
| Economic decision making using economic factors | 1.5 |
| Hand and excel exercises | 1.5 |
| Nominal and effective interest rate | 1.5 |
| Hand and excel exercises | 1.5 |

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| Deferent forms of payment and compounding periods | 1.5 |
| Hand and excel exercises | 1.5 |
| Economic indicators and proposal evaluation | 1.5 |
| Hand and excel exercises | 1.5 |
| Inflation and indirect cost | 1.5 |
| Hand and excel exercises | 1.5 |
| Breakeven analysis | 1.5 |
| Hand and excel exercises | 1.5 |
| Sensitivity analysis | 1.5 |
| Hand and excel exercises | 1.5 |
| Global revision | 3 |
| Case Study | 15 |
| **TOTAL HOURS** | **60** |
| Plus **RECOMMENDED INDEPENDENT STUDY HOURS** | **120** |
| **TOTAL COURSE HOURS** | **180** |

## 7. RECOMMENDED READING

**Core text/s:**

Leland T Blank & Anthony Tarquin (2017) Engineering Economy (8th edition), McGraw-Hill Education

**Library + online resources:**

MIT-esd-70j-fall-2009 - MIT OpenCourseware
https://ocw.mit.edu/courses/engineering-systems-division/esd-70j-engineering-economy-module-fall-2009/