# Engineering Economics

| Course Code | Credit Hours |
|---|---|
| ECO-130 | 2-0 |

**Course Description**

Engineering economics emphasizes the systematic evaluation of the costs and benefits associated with proposed technical projects. The student will be exposed to the concepts of the “time value of money” and the methods of discounted cash flow. Students are prepared to make decisions regarding money as capital within a technological or engineering environment. This course is mainly concerned with economic analysis for engineering and managerial decision making by the use of techniques for evaluating the worth of prospective projects, investment opportunities and design choices.

**Text Book:**

1. Engineering Economy by Leland T. Blank, Anthony J. Tarquinii **7TH** edition

**Reference Book:**

1. Fundamentals of Engineering Economics, 3rd ed., by Chan S. Park
2. Engineering Economy. Macmillan Publishing Company, New York .DeGarmo, E. Paul; Sullivan, G. William and Bontadelli, A. James.
3. Engineering Economic and Cost Analysis. Harper & Row, Publishers, New York. Collier, A. Courtland and Ledbetter, B. William.
4. Principles of Engineering Economic Analysis. John Wiley & Sons.White, A. John; Agee H. Marvin and Case, E. Kenneth.

**Prerequisites :**

Nil**.**

**ASSESSMENT SYSTEM FOR THEORY**

| | Without Project (%) | With Project/Complex Engineering Problems (%) |
|---|---|---|
| Quizzes | 15 | 10-15 |
| Assignments | 10 | 5-10 |

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|---|---|---|
| Mid Terms | 25 | 25 |
| Project | - | 5-10 |
| End Semester Exam | 50 | 45-50 |

**ASSESSMENT SYSTEM FOR LAB**

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| Lab Work/ Psychomotor Assessment/ Lab Reports | 70% |
| Lab Project/ Open Ended Lab Report/ Assignment/ Quiz | 10% |
| Final Assesment/ Viva | 20% |

**Teaching Plan**

| Week No | Topics/Learning Outcomes |
|---|---|
| 1 | Difference Between Finance Accounting and Economics |
| | Foundations of Engineering Economy, introduction of the basic concepts and terminology |
| | How Time and Interest Affect Money |
| 2 | Interest rate and Equivalence |
| | Types of Interests |
| | Types of Funding |
| | WACC and MARR |
| | Re Payment Plans |
| | Rule 72 and Opportunity Costs |
| 3 | Cashflows and its types |
| | Solving the Cashflows |
| | Irregular Cashflows |
| | Sigle Cashflow Projects |
| 4 | Athematic Series |
| | Geometric Series |
| | Use of Factor Table |
| | Finding the Missing Value |
| 5 | Combining Factors |
| | Shifted Series |
| | Combination of Series |
| | Shifted and Combination of Series |
| 6 | Types of Interests |
| | Nominal Interest Rates |
| | Effective Interest Rates |
| | Floating Interest Rates |
| | Real interest rates |

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| 7 | Present Worth Analysis |
| | Types of Alternatives |
| | Use of MARR as a Discounting Factor |
| | Evaluation of Complex Projects |
| | Future Worth Analysis |
| 8 | Annual Worth Analysis |
| | LCM and Study Period Methods |
| | Evaluation of Permanent Projects |
| | Evaluation of Recurring and Non-Recurring Costs |
| 9 | MSE |
| 10 &11 | Interpretation of a Rate of Return Value |
| | Rate of Return Calculation Using a PW or AW Relation |
| | Special Considerations When Using the ROR Method |
| | Multiple Rate of Return Values |
| | Techniques to Remove Multiple Rates of Return |
| 12 &13 | Rate of Return Analysis: Multiple Alternatives |
| | Why Incremental Analysis Is Necessary |
| | Calculation of Incremental Cash Flows for ROR Analysis |
| | Interpretation of Rate of Return on the Extra Investment |
| | Rate of Return Evaluation Using PW: Incremental and Breakeven |
| | Rate of Return Evaluation Using AW |
| | Incremental ROR Analysis of Multiple Alternatives |
| 14 &15 | Benefit/Cost Analysis and Public Sector Economics |
| | Public Sector Projects |
| | Benefit t/Cost Analysis of a Single Project |
| | Alternative Selection Using Incremental B/C Analysis |
| | Incremental B/C Analysis of Multiple, Mutually Exclusive Alternatives |
| | Service Sector Projects and Cost-Effectiveness Analysis |
| 16 | Breakeven Analysis<br>Taxes |
| | Sensitivity Analysis |
| | Incremental Analysis based on Benefit-Cost Ratio |
| 17 | ESE |

**Practical**: Nil.