

Course Title: Engineering Economics

Course Code: MGTS 301

Credit Hours: 3

Course Description:

This course provides the understanding of basic economic structures and the tools to evaluate engineering projects in the public sector, private sector and utility areas.

Course Contents:

Unit 1: Introduction to Engineering Economy

Origin, principles, objectives and basis of engineering economy, engineering economy and design process, engineering economic analysis procedure, accounting and engineering economic studies

Unit 2: Cost Concepts and Design Economics

Introduction cost estimating (top down & bottom up) and cost terminology (different types of cost: opportunity, sunk etc), the general economic environment (general economic terms; demand, supply, utility, value, luxury, necessity, monopoly, perfect market), break-even point, cost-driven design optimization

Unit 3: Money-Time Relationships and Equivalence

Introduction, simple and compound interests, Equivalence-concept, cash flow diagrams, simple interest formula for present, future and annual equivalents (singly cash flow, uniform cash flow, uniform gradient, deferred uniform gradient, uniform geometric: *only for single interest and discrete compounding*), nominal and effective interest rate

Unit 4: Applications of Money-Time Relationship

MARR, PW, FW and AW method, IRR and ERR method, payback period method

Unit 5 Comparing Alternatives

Analysis & comparison of project using IRR, NPV, PW, FW, AW: Useful lives equal to study period, useful lives are different among alternatives, mutually exclusive combinations of projects, *Replacement Analysis:* Reasons and factors for replacement studies, economic life

Unit 6: Cost & Benefit Estimation Technique

Integrated approach to develop the net cash flows, parametric cost estimating, cost estimation in the design process, value engineering

Unit 7: Analysis of Alternatives with Benefit Cost (B/C ratio)

Use of B/C ratio and its analysis

Unit 8: Depreciation

Concept and terminology; Classical depreciation methods

Unit 9: Dealing with Uncertainty

Risk and uncertainty, sensitivity analysis

References:

1. William G. *Sullivan*, Elin M. Wicks, C. Patrick Koelling, *Engineering Economy*, Pearson
2. Chan S. Park, *Contemporary Engineering Economics*, Prentice Hall