Course Code	Course Title	L	T	P	C
BHUM207L	Engineering Economics	3	0	0	3
Pre-requisite	NIL	Syllabus Version			
		1.0			

Course Objectives

1. To introduce the basic concepts of economics in engineering decision making, theories and tools of economics in engineering applications
2. To analyze cost and revenue data and carry out economic analysis to justify or rejectalternatives and projects based on an economic perception
3. To analyze the risk and project uncertainty and to provide guidance to use the appropriateapproach to handle the project uncertainty

Course Outcomes

Upon successful completion of the course students will be able to

1. Comprehend the basic principles of engineering economics.
2. Evaluate the methods of cost estimation and forecast the present and future values of cashflows.
3. Identify project appraisal techniques and evaluate the key factor of the project which definesthe viability of a project proposal.
4. Determine the depreciation and understand the tax impact while calculating depreciation.
5. Identifying, analyse and manage various types of risk.
6. Make decisions on investing funds in the most appropriate and efficient projects.

Module:1	Overview of Engineering Economics	4 hours

The Principles of Engineering Economics – Engineering Economics and the Design Process –Engineering Economic Analysis.

Module:2	Cost Concepts and Cost Estimation Techniques	6 hours

Cost Concepts - Cost terminology - The General Economic Environment - Cost-Driven Optimisation. Cost Estimation Techniques – An Integrated Approach - Selected EstimatingTechniques (Models) and Parametric Cost Estimating.

Module:3	The Time Value of Money	8 hours

Simple Interest - Compound Interest - The concept of Equivalence. Cash flows – Relating present and future equivalent values of single Cash Flows - Relating a uniform series (Annuity) to its present and future equivalent values – Deferred Annuities – Equivalence calculations involving multiple interest formulas – uniform (Arithmetic) Gradient of cash flow – Geometric sequences of cash flow – Interest rates that varies with time - Nominal and effective interest rate – compounding more often than once per year – continuous compounding and discrete cash flow.

Module:4	Project Estimation and Evaluation Techniques	8 hours

Determining the minimum attractive rate of interest (MARR) – The present worth method – The future worth method - The annual worth method - The internal rate of return method - The external rate of return method and payback (payout) period method. Evaluation of Alternatives – comparison and selection among alternatives - Techniques of Evaluation. Cost-Benefit Analysis – Perspective and terminology for analysing public projects and evaluating independent projects.

Module:5	Depreciation and Income Taxes	6 hours

Depreciation concepts and terminology - The classical depreciation methods – The modified accelerated cost recovery system – Income taxes – The effective corporate income rate – Gain (loss) on the disposal of an asset – General procedure for making After-tax economic analysis and Economic value added.

Module:6	**Project Risk Analysis**	**5 hours**
Breakeven analysis – Sensitivity analysis – Multiple factor sensitivity analysis. Probabilistic risk analysis – Sources of uncertainty – Distribution of random variables – Evaluation of projects – Discrete random variables and Continuous random variables - Evaluation of risk and Uncertainty by Monte Carlo Simulation.		
Module:7	**The Capital Budgeting Process and Decision Making**	**6 hours**
Debt Capital – Equity capital – The weighted average cost of capital (WACC) – Project selection – Budgeting of Capital Investments and Management Perspective – Leasing decision and Capital allocation. Multi-attributes – Choices of attributes, Selection of a measurement scale, and Dimensionality of the problem – Compensatory and Non-compensatory models.		
Module:8	**Contemporary Issues**	**2 hours**
	Total Lecture Hours	**45 hours**

Text Book (s)	
1.	Sullivan G William, Elin M Wicks and C. Patrick Koelling (2018), Engineering Economy.Pearson Education, 17th Edition.
Reference Books	
1.	Blank, Leland and Anthony Tarquin (2017), Engineering Economy. Tata Mc Graw Hill, 8th Edition.
2.	Chan S.Park (2019), Fundamentals of Engineering Economics. Pearsons Education, 4th Edition.

Mode of Evaluation: CAT, Quiz, Assignment and FAT.			
Recommended by Board of Studies	23-02-2023		
Approved by Academic Council	No. 69	Date	16-03-2023