INDUSTRIAL ECONOMICS

ENIE 252

Lecture : 3 **Year : II**
Tutorial : 1 **Part : II**
Practical : 0

Course Objectives:
The objective of this course is to equip students with basic understanding of industrial and engineering economics, enabling them to analyze economic problems, evaluate market structures, and make informed financial decisions. After completion of this course students will be able to perform cost estimation, asset replacement, sustainability economics, and innovation management to optimize resources and enhance productivity in industrial operations.

1 Introduction (3 hours)

1.1 Scope and relevance of economics in industrial engineering
1.2 Relationship between industrial economics and engineering economics
1.3 Key concepts: Demand, supply, and cost concepts

2 Microeconomics for Industrial Applications (8 hours)

2.1 Demand and supply analysis
2.2 Elasticity and applications in pricing and forecasting
2.3 Consumer behavior
2.4 Producer behavior, cost and production analysis
2.5 Cost concepts: fixed, variable, marginal, and total costs
2.6 Economies of scale and scope
2.7 Market structures
2.8 Perfect competition, monopoly, oligopoly, and monopolistic competition
2.9 Exchange rate system

3 Macroeconomics and Industry (6 hours)

3.1 National income and economic indicators
3.2 Inflation, interest rates, and their industrial impacts
3.3 Fiscal and monetary policies affecting industries
3.4 Government budget
3.5 Industrial policy and economic development
3.6 Labor market dynamics
3.7 Global trade
3.8 Import substitutions and export promotion

4 Engineering Economic Analysis (12 hours)

4.1 Time value of money: Present worth, future worth, and annual equivalent worth, discounted cash flow and net present value (NPV)

4.2 Economic decision-making techniques: Benefit-cost analysis, payback period, internal rate of return (IRR), and break-even point analysis, sensitivity analysis, depreciation methods and tax implications

4.3 Replacement and maintenance analysis: Economic life of assets, trade-off between maintenance and replacement

4.4 Industrial project risk and risk analysis methods and applications

5 Financial Performance and Cost Analysis (10 hours)

5.1 Financial ratios: Liquidity, profitability, and solvency ratios

5.2 Financial reports: Balance sheets, income statements, and cash flow analysis

5.3 Cost estimation techniques: Fixed, variable, and semi-variable costs, direct and indirect costs, activity-based costing (ABC)

5.4 Costing in projects: Cost classification and allocation, breakeven analysis

6 Technological Change and Innovation Economics (4 hours)

6.1 Role of technology in industrial and engineering growth

6.2 Cost-benefit analysis of technological investments

6.3 Gig economy

6.4 Artificial intelligence and it economy

6.5 Economics of research and development

7 Sustainability and Environmental Economics (2 hours)

7.1 Economics of sustainable development and circular economy

7.2 Environmental policies and their impacts on industry

7.3 Concept of green economy

Tutorial (15 hours)

1. Solving numerical problems on demand, supply, and price elasticity
2. Group activity: Identifying real-world industrial economic principles
3. Case study: Pricing strategies in monopoly, oligopoly, and competitive markets
4. Solving problems on cost functions, economies of scale, and profit maximization
5. Discussion on real-world price discrimination and its applications
6. Analysis of GDP, inflation, interest rates, and their impact on industries
7. Group discussion: Effects of fiscal and monetary policies on industrial growth
8. Research task: Evaluating recent government policies and their implications for manufacturing and services

9. Solving problems on time value of money, PW, AW and FW
10. Exercises on investment decision-making: NPV, IRR and BCR
11. Case discussion: Choosing between alternative industrial projects based on economic feasibility
12. Asset replacement decisions using economic life vs service life
13. Discussion: Strategies to optimize maintenance costs in industries
14. Case study: Cost-benefit analysis of preventive vs corrective maintenance
15. Numerical exercises on cost estimation, break-even analysis, and cost-volume-profit analysis
16. Case study: Costing techniques in manufacturing and service industries
17. Group problem-solving: Applying activity-based costing and marginal costing in real-world scenarios
18. Economic evaluation of renewable energy and green manufacturing practices
19. Case discussion: Circular economy and sustainable industrial strategies.
20. Group exercise: Cost-benefit analysis of R&D investment in sustainable technology

Final Exam

The questions will cover all the chapters in the syllabus. The evaluation scheme will be as indicated in the table below:

Chapters	Hours	Marks distribution*
1	3	4
2	8	10
3	6	8
4	12	18
5	10	12
6 and 7	6	8
Total	**45**	**60**

* There may be minor deviation in marks distribution.

Reference

1. Samuelson, P. A., Nordhaus, W. D. (2019). Economics (20th ed.). McGraw-Hill Education.
2. Devine, P. J., Lee, N., Jones, R. M., Tyson, W. J. (1985). Industrial Economics and Organization (1st ed.). Routledge.
3. Shepherd, W. G., Shepherd, J. M. (2003). The Economics of Industrial Organization (5th ed.). Waveland Press.
4. Thomas, C. R., Maurice, S. C. (2015). Managerial Economics: Foundations of Business Analysis and Strategy (12th ed.). McGraw-Hill Education.
5. Park, C. S. (2018). Fundamentals of Engineering Economics (4th ed.) Pearson.