IE 5003 Cost Analysis and Engineering Economy
Workload: 3-0-0-3-4

Description: The objective of this subject is to train engineers to estimate appropriate cost, evaluate and decide on the most optimal economic choice of engineering projects. Techniques for cost estimation, cost allocation, activity-based costing and life cycle costing analysis will be introduced. Economic analyses of engineering projects over time under conditions of certainty and uncertainty will be discussed. Methods of capital sourcing and allocation for competing projects will also be introduced.

Syllabus:

1. Introduction and Basic Concepts
   Role of engineering economics and introduction to cost concepts.

2. Time-Value of Money
   Simple interests, compound interests, concept of equivalence, interest formulas, single sums of money, series of cash flows, cash clow diagrams, compounding frequency, nominal and effective rates, continuous compounding.

3. Comparing Alternative Investment Projects
   Present worth, annual worth future worth, internal rate of return, external rate of return payback period. Benefit-cost ratio methods. Public projects evaluation. Depreciation and taxes. Replacement analysis.

4. Capital Planning and Budgeting
   Capital planning and budgeting, sources of funds, debt and equity capital, identification and evaluation of opportunities, project selection and post-morten reviews. Mathematical programming techniques for capital budgeting. Cost of capital.

5. Risk and Uncertainty in Economic Evaluation
   Causes of risk and uncertainty, methods of analyses, reduction of uncertainty, breakeven analysis, sensitivity analysis, risk analysis using analytical methods and simulation

6. Cost Estimating
   Classification of cost. Cost accounting principles, cost estimation models and methods, learning curves and progress functions, estimating manufacturing, quality and maintenance costs.

7. Cost Allocation and Control
   Job order costing, process costing, standard cost, indirect cost allocation, activity-based costing (ABC), life-cycle costing (LCC).

Text:

- W.G. Sullivan, E.M. Wicks and J.T. Kuxhoj, Engineering Economy, (12^{th} ed.), Prentice Hall, 2003.

References:

- Chan S. Park, Contemporary Engineering Economics, (3^{rd} ed.), Prentice Hall, 2002.