

PROJECT MANAGEMENT

ENIE 412

Lecture : 3
Tutorial : 1
Practical : 0

Year : IV
Part : I

Course Objectives:

The objective of this course is to provide students with a comprehensive understanding of the project environment while developing the practical skills necessary to conduct feasibility studies and draft professional project proposals. It aims to equip students with robust techniques for planning, implementing and controlling projects, including the management of financial resources, auditing processes and associated risks.

1 Introduction (6 hours)

- 1.1 Definition of project, objective and goal and characteristics
- 1.2 Classification of projects
- 1.3 Development and modern trends of project management
- 1.4 Project life cycle (PLC): Phases, level of effort and influence of stakeholders
- 1.5 Project environment: Internal and external factors
- 1.6 Elements of project management

2 Project Appraisal and Project Formulation (7 hours)

- 2.1 Concept of project appraisal
- 2.2 Economic and financial analysis: Time value of money, NPV, IRR and payback period
- 2.3 Project proposal development: Technical and financial components for bidding
- 2.4 Feasibility analysis: Market, technical and environmental (EIA/IEE) considerations
- 2.5 Resource identification and logistical planning

3 Project Planning and Scheduling (9 hours)

- 3.1 Concept of project planning and its Importance
- 3.2 Work breakdown structure (WBS)
- 3.3 Project scheduling with bar chart, CPM and PERT
- 3.4 Resource management: Resource leveling versus resource smoothing
- 3.5 Project risk management: Identification, qualitative analysis and mitigation strategies
- 3.6 Impact analysis: Consequences of time and cost overruns

4 Project Implementation and Controlling (7 hours)

- 4.1 Project monitoring, evaluation and controlling
- 4.2 Project control cycle
- 4.3 Elements of project control (Time, cost and quality)
- 4.4 Project schedule control
- 4.5 Project cost control: Methods and procedure (Earned value analysis)
- 4.6 Project quality control
- 4.7 Project management information system (PMIS)
- 4.8 Communication and reporting: Progress reports and stakeholder updates

5 Project Evaluation and Auditing and Closure (6 hours)

- 5.1 Purpose and types of project evaluation (Mid-term, terminal and ex-post)
- 5.2 Project auditing systems: Financial and performance audits
- 5.3 Benefits of integrated monitoring and auditing systems
- 5.4 Impact assessment and sustainability analysis
- 5.5 Project termination: Administrative closure, contractual legalities and handover protocols
- 5.6 Post-project review: Lessons learned and knowledge management

6 Procurement and Contract Management (10 hours)

- 6.1 Public procurement act and regulation
- 6.2 Types, method and tools of procurement
 - 6.2.1 Goods, works and services
 - 6.2.2 Direct, sealed quotation, tender
 - 6.2.3 Force account, users' committee
 - 6.2.4 Expression of interest, request for proposal
- 6.3 Preparation of detailed cost estimate
- 6.4 Technical sanction and budget approval
- 6.5 Procurement condition, steps and provisions
- 6.6 Tender and standard bidding documents
- 6.7 Tender notice, submission
- 6.8 Methods of selection and evaluation of proposals
- 6.9 Types of contract: Based on payment; Build own operate transfer; Design and built; Turnkey; Engineering procurement construction
- 6.10 Negotiations, contract award and agreement

Tutorial (15 hours)

- 1. Practice developing a Project Charter and a Logical Framework Matrix (LogFrame) for a selected engineering case study
- 2. Exercise on decomposing a project into work packages and assigning organizational responsibility codes
- 3. Numerical problems on forward/backward pass, identifying critical paths and calculating probability of completion using three-point estimation using network analysis (CPM and PERT)

4. Manual exercises to optimize resource allocation under constrained and unconstrained timelines with the help of resource leveling and smoothing
5. Project crashing and trade-offs: Calculations for time-cost optimization to determine the most economical way to shorten project duration
6. Numerical analysis of project status using cost variance (CV), schedule variance (SV) and forecasting final estimates (EAC) by earned value management (EVM) approach
7. Software application and case study: Practical sessions using MS Project or Primavera to generate Gantt charts, identify critical paths and simulate project tracking for the group presentation

Final Exam

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

Chapter	Hours	Mark distribution*
1	6	8
2	7	10
3	9	12
4	7	10
5	6	8
6	10	12
Total	45	60

* There may be minor deviation in marks distribution.

References

1. Chandra, P. (2019). Projects: Planning, analysis, selection, financing, implementation and review (9th ed.). Tata McGraw-Hill.
2. Cleland, D. I., Ireland, L. R. (2006). Project management: Strategic design and implementation (5th ed.). McGraw-Hill Education.
3. Meredith, J. R., Mantel, S. J., Jr., Shafer, S. M. (2021). Project management: A managerial approach (11th ed.). John Wiley & Sons.
4. Nagarajan, K. (2021). Project management (8th ed.). New Age International (P) Limited.
5. Pinto, J. K. (2022). Project management: Achieving competitive advantage (6th ed.). Pearson.
6. Project Management Institute. (2021). A guide to the project management body of knowledge (PMBOK guide) (7th ed.).
7. Yescombe, E. R. (2014). Principles of project finance (2nd ed.). Academic Press.