Marwadi University

Bachelor of Technology
Civil Engineering

01CI0810 Infrastructure Engineering and Management

Objective of the Course

Objectives of introducing this subject at fourth year level in civil branches is:

- To provide an overview of Infrastructure project.
- To develop an understanding of Infrastructure Master Plan, Development Plan and various project activities involved.

Credits Earned: 4

Students Learning Outcomes

After studying this subject student will be able to:

- Develop infrastructure master plan and Schedule infrastructure project activities.
- Prepare project development plan for infrastructure organizations and systems.
- Prepare tender documents for infrastructure project by understanding different engineering contracts.
- Apply the management techniques like CPM and PERT to infrastructure projects.
- Analyze the management process for infrastructure projects

Teaching and Examination Scheme

Subject Name	Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
	Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term Work (TW)	
Infrastructure Engineering and Management	3	0	2	4	50	30	20	25	25	150

Detailed Syllabus

Sr. No	Topic name	Hours
1	**Infrastructure**	**7**
	Definitions of infrastructure, Governing Features, Historical overview of Infrastructure development in India, Infrastructure Organizations & Systems.	7
2	**Infrastructure Planning**	**10**
	Typical infrastructure planning steps, Planning and appraisal of major infrastructure projects, Screening of project ideas, Life cycle analysis, Multi-criteria analysis for comparison of infrastructure alternatives, Procurement strategies, Scheduling and management of planning activities, Infrastructure Project Budgeting and Funding, Regulatory Framework, Sources of Funding.	10

3	**Project Management in Construction**	**16**
	Introduction to project management processes - Initiating, Planning, Executing, Controlling, and Closing processes	5
	Project Integration Management - Project plan development, Project plan execution, and Overall change control	5
	Project Scope Management - Initiation, Scope planning, Scope definition, Scope verification, and Scope change control.	6
4	**Contracts and management of contracts**	**9**
	Engineering contracts and its formulation, Definition and essentials of a contract, Indian Contract Act 1872, types of contracts and clauses for contracts, Preparation of tender documents, Issues related to tendering process, Awarding contract.	9
	TOTAL	**42**

List of Practical's

Sr. No	Topic name
1	To prepare at least one infrastructure plan (individually) and should have to prepare project development plan and tender document for the same infrastructure plan.
2	To learn available project management tool.

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
15%	25%	20%	20%	10%	10%

Instructional Method and Pedagogy

1. Prerequisite of the course and its pattern shall be discussed on the commencement of the course.
2. Lectures shall be conducted in class room using various teaching aids.
3. Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation.
4. At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.
5. The laboratory experiments are planned in such a way that it covers the practical aspects of the course contents. The performance of these experiments shall bring the clarity of the theoretical concepts which the students have studied during the academic sessions.

Recommended Study Material

Reference Books:

1. J. Parkin and D. Sharma, Infrastructure planning, Thomas Telford, London, 1999.

2. P. Chandra, Projects: Planning, analysis, selection, financing, implementation, and review, Tata McGraw-Hill, New Delhi, 2009.
3. J. D. Finnerty, Project financing - Asset-based financial engineering, John Wiley & Sons, New York, 1996.
4. L. Squire and H. G.van der Tak, Economic analysis of projects, John Hopkins University Press, London, 1975.
5. T. Hegazy, Computer-based construction project management, Prentice Hall, New Jersey, 2002.
6. S. M. Levy, Project management in construction, 5th ed., McGraw Hill, New York, 2007.
7. PMI, A guide to the project management body of knowledge, 3rd ed., Project Management Institute, Pennsylvania, 1996.
8. M. Mawdesley, W. Askew and M. O'Reilly, Planning and controlling construction projects, Addison Wesley Longman Limited, Essex, 1997.
9. J. Kelly, S. Male and D. Graham, Value management of construction projects, Blackwell Publishing, Oxford, 2003.
10. Vasant Desai, "Project Management", Himalaya Publishing , 1st Edition, 2010
11. James C. Van Horne, John M. Wachowicz, "Fundamentals of Financial Management", PHI, 2nd Edition, 2000
12. Ronald W Hudson, "Infrastructure Management: integrating design, Construction, maintenance, rehabilitation and renovation", MGH, 1st Edition, 1997
13. "Codes of Practice and Standard Specifications" of AP PWD, CPWD, MES etc.
14. B.J. Vasavada, "Engineering Contracts and Arbitration", Jubilee Publications, 2nd Edition., 1996
15. Grig N. S., "Infrastructure Engineering and Management", Wiley-Interseience, 198