



**Gyanmanjari**  
Innovative University

Course Syllabus  
Gyanmanjari Institute of Technology  
Semester-2

**Subject :** Infrastructure Management - METCP12515

**Type of course:** Minor Stream

**Prerequisite:** NIL

**Rationale:** Infrastructure management plays a pivotal role in maintaining and enhancing the functionality, safety, and sustainability of essential public assets. It encompasses the strategic planning, operation, maintenance, and development of infrastructure systems such as transportation networks, water supply systems, energy grids, and telecommunications. The rationale for effective infrastructure management is multifaceted: it ensures optimal utilization of resources, minimizing inefficiencies and maximizing societal benefits. Regular maintenance and upgrades are crucial for ensuring the safety and reliability of infrastructure, reducing risks to users and mitigating disruptions. Sustainable infrastructure management practices consider environmental impacts, promote resilience against climate change, and ensure long-term viability. Economically, well-managed infrastructure supports growth by facilitating transportation, commerce, and communication networks, attracting investments, and generating employment opportunities.

#### Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

*Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*

#### Course Content:

Sr. No	Course content	Hrs	% Weightage
1	<b>Introduction:</b> Definition, characteristics of infrastructure, Scope of	9	15%



	infrastructure management, infrastructure project lifecycle.		
2	<b>Urban and Rural Infrastructure</b> The urban infrastructure, The rural infrastructure, An introduction to special economic zones, organizations in the field of infrastructure and Infrastructure in India. An overview of infrastructure project finance.	11	20%
3	<b>Privatization of Infrastructure</b> A Historical overview, benefits, problems and challenges in privatization of infrastructure, Privatization in India. Infrastructure development through PPP route, benefits of PPP, mode of procurement, types of PPP models and contractual structure. Financial and economic appraisal of BOT projects, VFM evaluation, Bankable concession agreement. Case Study – Procurement process of Indian PPP projects.	13	20%
4	<b>Infrastructure Risk Management</b> Risks in infrastructure, legal and contractual issues, quantitative risk analysis, qualitative risk management, risk management concept, risk management strategies.	12	20%
5	<b>Strategies for Successful Infrastructure Project Implementation</b> Shaping the Planning Phase of Infrastructure Projects to mitigate risks. Designing Sustainable Contracts. Introduction to Fair Process and Negotiation. Sustainable Development of Infrastructure. Information Technology and Systems for Successful Infrastructure Management. Innovative Design and Maintenance of Infrastructure Facilities. Capacity Building and Improving the Governments Role in Infrastructure Implementation. An Integrated Framework for Successful Infrastructure Planning and Management.	15	25
	<b>Total</b>	<b>60</b>	<b>100</b>

**Continuous Assessment:**

Sr. No	Active Learning Activities	Marks
1	<b>Research and analysis:</b> Faculty will assign one infrastructure (e.g. Road, Bridge, port, airport, etc.) for research and analysis. Student will analyze their risk management and prepare the report on it and upload on GMIU Web Portal.	10
2	<b>Risk Solution:</b> Faculty will assign the infrastructure in 1 <sup>st</sup> ALA into that they will analyze risk. Student will give the solution of the 1 <sup>st</sup> ALA activity and upload o GMIU Web Portal.	10



3	<b>Budget and Financial Planning:</b> Faculty will assign the proposed infrastructure to the student. Student will prepare that infrastructure detail budget and financial planning and upload on GMIU Web Portal.	10
<b>Total</b>		<b>30</b>

### Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	NA	NA	NA	NA	NA	NA

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

### Course Outcome:

After learning the course, the students should be able to:	
CO1	categorize infrastructure projects within the context of their lifecycles.
CO2	differentiate between urban and rural infrastructure components and special economic zones.
CO3	compare among various PPP models for infrastructure development.
CO4	formulate strategies to identify, assess, and mitigate risks in infrastructure projects.
CO5	design comprehensive framework for successful infrastructure management and implementation

### List of Assignment

Assignment and tutorial base on above mention topic.

### Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.



Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

**Text Books:**

- [1] "Infrastructure Development and Financing" Towards A Public Private Partnership, G. Raghuram, Macmilan Publisher, New Delhi
- [2] Infrastructure Development, Alagiri ICFAI University Press, Hyderabad
- [3] Infrastructure Planning Handbook: Planning, "Engineering and Economic by by Alvin Goodman, Makarand Hastak
- [4] Public-Private Partnerships "Managing risks and opportunities" Akintoye, A., Beck. M., and Hardcastle, C., Oxford: Blackwell Science Limited

