

# GUJARAT TECHNOLOGICAL UNIVERSITY

## CIVIL (CONSTRUCTION ENGINEERING AND MANAGEMENT) (14)

### INFRASTRUCTURE PROJECTS

**SUBJECT CODE: 2741403**

M.E. 4<sup>th</sup> SEMESTER

**Type of course:** Major elective

**Prerequisite:** Nil

**Rationale:** NA

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	ESE (V)		PA (I)			
					ESE	OEP	PA	RP		
3	2#	0	4	70	30	30	0	10	10	150

**Content:**

Sr. No.	Content	Total Hrs	% Weightage
<b>1</b>	<p><b>Introduction</b></p> <p>Definition of infrastructure, characteristics of infrastructure projects, scope of infrastructure management. Infrastructure in India: An Overview of the Power Sector in India. Water Supply and Sanitation Sector. The Road, Rail, Air and Port Transportation Sectors. Telecommunications Sector. The Urban Infrastructure. The Rural Infrastructure. An Introduction to Special Economic Zones. Organizations and Players in the field of Infrastructure.</p> <p>The Stages of an Infrastructure Project Lifecycle.</p> <p>An Overview of Infrastructure Project Finance.</p>	10	25
<b>2</b>	<p><b>Privatization of Infrastructures</b></p> <p>A Historical Overview of Infrastructure Privatization.</p> <p>The Benefits of Infrastructure Privatization. Problems with Infrastructure Privatization. Challenges in Privatization of Infrastructure.</p> <p>Privatization of Infrastructures in India .</p> <p>Introduction to infrastructure development through PPP route; Benefits of PPP mode of procurement; Types of PPP Models and their contractual structure, Stakeholders' perspectives: Granting authority, Funders and Concessionaire, Government's role in successful PPP projects, Financial and Economic Appraisal of BOT Projects; VFM evaluation, PPP procurement process; Lifecycle of PPP projects, Contractual package of PPP project; Bankable concession agreement, Case study – Procurement process of Indian PPP projects.</p>	10	25
<b>3</b>	<p><b>Challenges to Successful Infrastructure Planning and Implementation</b></p> <p>Mapping and Facing the Landscape of Risks in Infrastructure Projects.</p> <p>Economic and Demand Risks. Political Risks. Socio-Environmental</p>	10	25

	Risks. Cultural Risks in Infrastructure Projects. Legal and Contractual Issues in Infrastructure. Challenges in Construction and Maintenance of Infrastructure. Introduction to risk management concept, Risk analysis techniques, Risk mitigation strategies		
<b>4</b>	<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. Negotiating with multiple Stakeholders on Infrastructure Projects. Sustainable Development of Infrastructure. Information Technology and Systems for Successful Infrastructure Management. Innovative Design and Maintenance of Infrastructure Facilities. Infrastructure Modeling and Life Cycle Analysis Techniques. Capacity Building and Improving the Governments Role in Infrastructure Implementation. An Integrated Framework for Successful Infrastructure Planning and Management	10	25

#### Reference Books:

1. Akintoye, A., Beck, M., & Hardcastle, C. (Eds.). (2003). Public-Private Partnerships - Managing risks and opportunities. Oxford: Blackwell Science Limited.
2. Alvin Goodman, Makarand Hastak, Infrastructure Planning Handbook: Planning, Engineering, and Economics 1st Edition ,MH/ASCE press.
3. Raghuram G (2001) Infrastructure Development And Financing Towards A Public Private Partnership, Macmillan Publishers, New Delhi
4. Alagiri, Infrastructure Development, ICFAI University press, Hyderabad
5. Marcel Hertogh, Stuart Baker, Pau Lian Staal-Ong, Eddy Westerveld, Managing Large
6. Infrastructure Projects, ISBN/EAN 978-90-810025-2-3, NUR-code 801.
7. Finnerty, J. D. (1996). Project financing - Asset-based financial engineering. New York: John Wiley & Sons, Inc.
8. Merna, T., & Njiru, C. (2002). Financing infrastructure projects (First ed.). London: Thomas Telford.
9. Nevitt, P. K., & Fabozzi, F. J. (2000). Project financing (7 ed.). London, UK: Euromoney Books.
10. Raghuram, G., Jain, R., Sinha, S., Pangotra, P., & Morris, S. (2000). Infrastructure Development and Financing: Towards a Public-Private Partnership: MacMillan.
11. Tinsley, R. (2002). Project Finance in Asia Pacific: Practical Case Studies. London, UK: Euromoney Books.
12. UNIDO. (1996). Guidelines for infrastructure development through Build-Operate-Transfer (BOT) projects. Vienna: UNIDO.
13. Walker, C., & Smith, A. J. (1995). Privatized infrastructure: the Build Operate Transfer approach. London: Thomas Telford.
14. Yescombe, E. R. (2002). Principles of Project Finance. California: Academic Press.
15. Kurowski, L., & Sussman, D. (2011). Investment project design - A guide to financial and economic analysis with constraints. New Jersey: John Wiley & Sons.
16. Pretorius, F., Lejot, P., McInnis, A., Arner, D., & Hsu, B. F.-C. (2008). Project finance for construction and infrastructure: Principles and case studies. Oxford: Blackwell Publishing.
17. Weber, B., & Alfen, H. W. (2010). Infrastructure as an asset class - Investment strategies, project finance and PPP. West Sussex: John Wiley & Sons

**Course Outcome:**

After learning the course the students should be able to:

1. know stages of an Infrastructure Project Lifecycle.
2. consider challenges to Successful Infrastructure Planning and Implementation.
3. prepare Strategies for Successful Infrastructure Project Implementation.

**List of Tutorials:**

Case studies of various infrastructures.

**Review Presentation (RP):** The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.