Semester VII Curriculum – Civil Engineering – IITRAM

Course	Code	Teaching Scheme & Credits
HSS-5 (Infrastructure Planning and Management)	HS4001	3-0-0-4
Building Design Project	CE4501	0-0-4-4
Urban Planning	CE4001	3-0-0-4
Open Elective – 1#		3-0-0-4
Open Elective – 2#		3-0-0-4

- Students have to opt open electives 1 and 2 from the following four subjects:

1. CE4002 Disaster Management (offered by Civil Dept.)
2. CE4003 Transportation System Management (offered by Civil Dept.)
3. EE4001 Renewable Energy Systems (offered by Electrical Dept.)
4. EE4004 Digital Control (offered by Electrical Dept.)

Course No	CE4501
Course Title	Building Design Project
Credits	L T P C 0 0 4 4
Prerequisites	---
Instructor(s)	---

Course contents:

The building design project shall focus on developing practical and analytical skills of students by either working individually or in a team on a problem that consist of any one or combination of various infrastructural aspects including analysis and design of structures, geotechnical investigations, water supply distribution system, irrigation engineering and transportation systems.

Any other Remarks:

Course No	CE4001
Course Title	Urban Planning
Credits	L T P C 3 0 0 4
Prerequisites	None
Instructor(s)	Dr.Yogesh U. Shah

Course contents:

Urbanization: Concepts and challenges, Indian and Global scenario, history of urbanization in India, urban class groups.**Urban Land Use Planning:**Objectives of Land Use Planning, Types of land uses, Land use patterns/urban forms, urban structure, land use models.**Urban Transportation Planning**: Planning Objectives; Planning Process; Transportation surveys; Four stage Travel Demand Modelling: Trip Generation, Trip Distribution, Modal Split and Route Assignment Analysis; Urban mass transit systems. **Urban Housing Planning**: Regulations and building bye-laws, principles of planning, housing schemes.**Urban Infrastructure Planning**: Urban service delivery; standards and norms for services like water supply, sanitation/sewerage, solid waste collection, drainage; investments for urban infrastructure, Infrastructure planning process.**Urban Environmental Planning**:Environmental Impact Assessment guidelines, Role and functions of various environmental organizations like CPCB, GPCB, MoEF; Integrating environmental considerations into urban planning, Environmental standards in India. **Urban Governance**: Indian system of urban government, Taxation system for urban services.

References Books/Manuals:

1. Infrastructure Planning Engineering and Economics, Alvin Goodman and MakarandHastak. (2015, McGraw Hill).
2. Modelling Transport (4 Edition), Juan de Dios Ortuzar and Luis G. Willumsen (2011, Wiley).
3. Urban Public Transportation –Systems and Technology, Vukan R. Vuchic (2007 Wiley).
4. Transportation Engineering: An Introduction (3rd Edition), C. JotinKhisty and B. Kent Lall
5. Urban Development in India, B Bhattacharya. (2006, Jain Book Depot).
6. Manual on norms and standards for environment clearance of large construction projects, Ministry of Environment and Forests, Government of India.
7. Urban Development Plans Formulation and Implementation (UDPFI), Report by Ministry of Urban Development, Government of India.

Any other Remarks:

Course No.	CE4002
Course Title	Disaster Management
Credits	L T P C 3 0 0 4
Prerequisites	None
Instructor	Dr. Vikas Pratap Singh

Course contents:

1. **Introduction to Disasters (04 hrs)**
   Understanding the Concepts and Definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, and Disaster Management.
2. **Fundamental of Disasters (07 hrs)**
   a) Types, Trends, Causes, Consequences and Control: Geological Disasters, Hydro-Meteorological Disasters, Biological Disasters, Technological Disasters, and Man-made Disasters.
   b) Global Disaster Trends – Emerging Risks of Disasters – Climate Change and Urban Disasters.
3. **Disaster Management Cycle and Framework (10 hrs)**
   Disaster Management Cycle – Paradigm Shift in Disaster Management,
   Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, Zonation and Microzonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness.
   During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency Operation Centre – Incident Command System – Relief and Rehabilitation.
   Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Strategy, Hyogo Framework of Action.
4. **Disaster Management in India (08 hrs)**
   Disaster Profile of India – Mega Disasters of India and Lessons Learnt, Disaster Management Act 2005 – Institutional and Financial Mechanism, National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter-Governmental Agencies.
5. **Role of Science and Technology in Disaster Management (08 hrs)**
   Geo-informatics in Disaster Management (RS, GIS, GPS and RS), Disaster Communication System (Early Warning and Its Dissemination), Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non-Structural Mitigation of Disasters, S&T Institutions for Disaster Management in India.
6. **Disaster Case Studies (05 hrs)**
   Various Case Studies on Disaster and Development, Disaster Prevention and Control, Risk Analysis and Management.

References Books:

1. Alexander, D., Natural Disasters, Kluwer Academic London, 1999.
2. Asthana, N.C., Asthana P., Disaster Management, Aavishkar Publishers, 2014.
3. Carter, N., Disaster Management: A Disaster Manager's Handbook, Asian Development Bank, Manila Philippines, 1991.
4. Collins, A.E., Disaster and Development, Routledge, 2009.
5. Coppola, D.P., Introduction to International Disaster Management, 2nd Edition, Elsevier Science, 2015.
6. Goyal, S.L., Encyclopedia of Disaster Management (Vols. 1-3), Deep & Deep, New Delhi, 2006.
7. Gupta, A.K., Nair, S.S., Environmental Knowledge for Disaster Risk Management, NIDM, New

Delhi, 2011.
8. Ibrahimbegovic, A., Zlatar, M., Damage Assessment and Reconstruction after War or Natural Disaster, Springer, 2009.
9. Menshikov, V.A., Perminov, A.N., Urlichich, Y.M., Global Aerospace Monitoring and Disaster Management, 2012.
10. Modh, S., Introduction to Disaster Management, Macmillian Publishers India, 2010.
11. National Institute of Disaster Management (NIDM) and National Disaster Management Authority (NDMA) publications.
12. Srivastava, H.N., Gupta, G.D., Management of Natural Disasters in Developing Countries, Daya Publishers, Delhi, 2006.

Any other Remarks:

Course No	CE4003
Course Title	Transportation System Management
Credits	L T P C 3 0 0 4
Prerequisites	Transportation Engineering
Instructor(s):	Dr. Jiten Shah

Course contents:

Development of Transportation Systems in India, Growth of Transport; Trends in Traffic; Disparities in transportation system; Functions, Problems & factors in transportation system management; National Transport Policy;Traffic regulation &transportation system management (TSM) - Speed, vehicle, parking, enforcement regulations, Mixed traffic regulation, Management techniques– Transportation System Management Process – TSM planning & Strategies: short term and long term-problems, strategic categories and action elements, travel behaviour impact and response time; Public transportation and parking management- park and ride, carpooling, exclusive lanes, shared ride, short term reserved parking, increased parking rates, time duration limits, expanded off-street parking, Non-Motorized Transport- pedestrian only streets; Demand Management: Staggered work hours, flexible work hours, high peak period tolls, shuttle services, circulation services, extended routes; Traffic Operations Improvement- On-street parking ban, freeway ramp control & closure, one-way streets, reversible lanes, traffic calming, reroute turning traffic;Airport Planning- Airfield Configuration - Runway Orientation, Elements of Airport Master Plan: - FAA - ICAO Guidelines;Planning and Airport Systems Management under different States. Principles of engineering economics- Overview, Supply and demand models, Elasticity applications.

References Books:

1. Khisty C J,LallB.Kent; *Transportation Engineering-An Introduction*, Prentice-Hall,NJ, 2005.
2. Chakroborty P., Das N., *Principles of Transportation Engineering*, PHI,New Delhi,2003
3. Papacostas C.S. and Prevedouros, P.D., *Transportation Engineering & Planning*, PHI, New Delhi,2002
4. Vukan R. Vuchic, Urban Public Transportation System & Technology, Prentice Hall, Inc.
5. David A. Hensher, Ann M. Brewer., *Transport: An Economics and Management Perspective*, Oxford University Press
6. Ortuzar J. D., Willumsen L.G., Modeling Transport, John Wiley & Sons, 1994
7. IRC: SP: 30-1993., *Manual on Economic Evaluation of Highway Projects in India.*
8. Sarkar P K., MaitriV.,*Economics in Highway and Transportation Planning,* Standard Publisher, New Delhi, 2010.
9. Norman J. Ashford, Saleh Mumayiz, Paul h. Wright; *Airport Engineering Planning, Design, and Development of 21st century Airports,* John Wiley & Sons, Inc.,2011

Any other Remarks: