

MASTER OF TECHNOLOGY (URBAN INFRASTRUCTURE)

Civil Engineering Department

Semester - I

Course Scheme

Course Code	Course Name	Lecture hours	Tutorial hours	Practical hours	Credit
CE 215008	Transportation Planning and Management	3	0	2	4
CE 215009	Solid Waste Management	3	0	2	4
CE215002	Geotechnics for Ground Modification	3	1	0	4
CEXXXXX	Elective - I	3	0	0	3
CEXXXXX	Elective - II	3	0	0	3
	Total	15	1	4	18

Civil Engineering Department

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I	Course Code	CE 215008			
II	Course Title	Transportation Planning and Management			
III	Credit Structure	L	T	P	C
		3	0	2	4
IV	Prerequisite(If any for the student)	Transportation Engineering			
V	Course Content	<ul style="list-style-type: none"> • Introduction: Overview of transportation planning, Internal and external components of system planning, Role of transportation in Society. • Transportation planning and Strategies: short term and long term problems, strategic categories and action elements, travel behavior impact: O-D pattern, Traffic flow theory. • Local Area Traffic Management: Design aspects, Pedestrian facilities, Bicycle Facilities, Restricted zones. Traffic Operations Improvement- On-street parking ban, freeway ramp control & closure, one-way streets, reversible lanes, traffic calming, reroute turning traffic. • Parking Management: Introduction, Ill effects of parking, Parking types, Parking generation and supply needs (IRC), Parking Management Strategies (IRC), Parking studies and characteristics, Parking Signages. • Urban Mass Transit System Performance Evaluation and Management: Definitions, Classification of UMTS, Characteristics of Mass transit system Operational characteristics and System characteristics, Planning of routing and scheduling. • Intersection Control and Design: Definitions, Classification of intersections At grade and Grade Separated, Layout of different types of intersections, Conflict points, Concepts of traffic control, Levels of Intersection controls, Types of Intersection controls, Design of Traffic rotaries, Design of Traffic signals. • Intelligent Transportation System (ITS): Role of ITS in TP, ITS infrastructure requirements. • Accident Analysis and Management: Objectives of accident studies, Causes of road accidents, Accident statistics, Accident data collection, Accident investigation, Accident data analysis, • Accident reconstruction: Poisson impact theory, Energy theory, Angular collision; Safety measures: engineering, enforcement and education, Road Safety audit. 			
VI	Practical's	Parking Survey and Analysis In-out method, License Plate method, Design of parking lots. Performance evaluation of BRTS and AMTS routes. Design of rotary intersections. Pedestrian survey and analysis Design of Signalized intersection Origin & Destination survey and analysis			

VII	Text/References	<ol style="list-style-type: none"> 1. Khisty C J, Lall B. 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. Sarkar P K., Maitri V., Economics in Highway and Transportation Planning, Standard Publisher, New Delhi, 2010
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Civil Engineering Department

Semester : I

I	Course Code	CE 215009			
II	Course Title	Solid Waste Management			
III	Credit Structure	L	T	P	C
		3	0	2	4
IV	Prerequisite(If any for the student)	Environmental Engineering			
V	Course Content	<ul style="list-style-type: none"> • Introduction Sources and types of solid wastes factors affecting generation of solid wastes, Quantity and composition of waste generated; methods of sampling and characterization; Effects of improper disposal of solid wastes public health effects. Effects on Environment. • On-Site Storage and Processing On-site storage methods on-site segregation of solid wastes automatic waste segregation methods-public health & economic aspects of storage options under Indian conditions Critical Evaluation of Options. • Waste Collection and Transport: Collection of mixed waste or of source separated waste, collection logistics, Methods of Collection types of vehicles Manpower requirement collection routes and route optimization algorithms; transfer stations selection of location, operation & maintenance; options under Indian conditions. • Treatment/disposal Technologies: Processing techniques and Equipment; Resource recovery from solid wastes composting, incineration, mechanical biological treatment, Pyrolysis - options under Indian conditions. • Dumping of solid waste; sanitary landfills site selection, design and operation of sanitary landfills Leachate collection and treatment • Role of informal sector in solid waste management in India. Case studies of different cities on their SWM model 			
VI	Text/References	<ol style="list-style-type: none"> 1. Ramachandra T.V., Management of Municipal Solid Waste TERI Press, 2006 2. George Tchobanoglous et.al., Integrated Solid Waste Management, McGraw-Hill Publishers, 1993. 3. B.Bilitewski, G.HardHe, K.Marek, A.Weissbach, and H.Boeddicker, Waste Management, Springer, 1994. 			
VII	Any other Remarks	This course includes a project on municipal solid waste management.			

Civil Engineering Department

Semester : I

I	Course Code	CE 215002			
II	Course Title	Geo technics for Ground Modification			
III	Credit Structure	L	T	P	C
		3	1	0	4
IV	Prerequisite(If any for the student)	Soil Mechanics/Geotechnical Engineering			
V	Course Content	<ul style="list-style-type: none"> • Introduction - Need for ground modification/improvement, State-of-the-art trends, Types of problematic soils, Classification and selection of ground modification methods. • Mechanical modification - Principles and methods of soil compaction, In-situ shallow compaction, Properties of compacted soil and compaction control, Deep compaction methods – dynamic compaction, blasting, vibro-compaction, vibro-replacement, stone columns. • Hydraulic modification - Preloading, Vertical drains, Vacuum consolidation, Dewatering methods, Electro-kinetic dewatering. • Physical and Chemical Modification - Admixtures, Grouting, Thermal modifications. • Other Innovative methods - Overview of ground improvement by inclusions and confinement. Ground improvement case studies. 			
VI	Text/References	<ol style="list-style-type: none"> 1. D.T. Bergado, L.R. Anderson, N. Muira and A.S. Balasubramaniam, Soft Ground Improvement in Low Land and Other Environment, ASCE Press. 2. M.P. Mosely and K. Kirsch, Ground Improvement, Spon Press. 3. Manfred R. Hausmann, Engineering Principles of Ground Modification, McGraw-Hill. 4. N.R. Patra, Ground Improvement Techniques, Vikas Publishing. 5. P. Purushothama Raj, Ground Improvement Techniques, Laxmi Publications. 6. P.G. Nicholson, Soil Improvement and Ground Modification Methods, Elsevier. <ol style="list-style-type: none"> 1. P.P. Xanthakos, L.W. Abramson and D.A. Bruce, Ground Control and Improvement, John Wiley and Sons. 			
VII	Any other Remarks				