



SYLLABUS

II SEM

CIVIL ENGINEERING

Course Title	Design of Special structures (Bridge/Tall structures)	
Course Code	CT207	
Course Credit	Lecture	: 03
	Practical	: 02
	Tutorial	: 00
	Total	: 04
Detailed Syllabus		
SECTION –I		
Sr. No.	Name of chapter & Details	Hours Allotted
1	INTRODUCTION	3
	Design philosophy- materials- loading- Gravity loading- Wind loading- Earthquake loading-blast loading.	
2.	BEHAVIOUR OF VARIOUS STRUCTURAL SYSTEMS	4
	factors affecting growth, height and structural form- High rise behaviour, rigid frames, braced frames, infilled frames, shear walls, coupled shear walls, wall frames, tubulars, cores, futrigger-braced and hybrid mega system.	
3	ANALYSIS AND DESIGN	10
	modeling for approximate analysis, Accurate analysis and reduction techniques. Analysis of building as total structural systems considering overall integrity and major subsystem interaction, Analysis for member forces, drift and twist, computerised general three dimensional analysis- Shear wall frame interaction.	
4	STABILITY OF TALL BUILDINGS	6
	Overall buckling analysis of frames- P- Delta analysis- Translational, torsional instability, out of plumb effects, effect of foundation rotation.	
SECTION –II		
5	CONSTRUCTION OF SUBSTRUCTURE FOR BRIDGES	7
	Pile foundations – site investigation – depth of exploration – in-situ testing- soil exploration techniques. Piling methods – pile types – pile driving methods – non-displacement piles – micro piles – durability problems in pile construction –	

	integrity testing – pile testing. Spacing of Piles - size of concrete piles tolerance in pile alignment - pile cap. Pile concreting under various soil conditions.	
6	CONSTRUCTION OF SUPERSTRUCTURE reinforced concrete superstructure- prestressed concrete superstructure - composite and steelsuperstructure - special superstructures. Geometrical alignment - lighting - Drainage - traffic lane width, road width, footpaths, and clearance for vehicles / boats - road kerb, crash barrier, parapet and handrail - expansion and roadway joints -super-elevation	10
7.	ELEMENTS OF BRIDGES Slab, T-beam and Box girder deck slab construction: Slab type, T-beam and box-girder bridges Decks Construction methods. Spanlengths -deck and stiffening system.	6
8.	SEGMENTAL CONSTRUCTION Segmental Construction, Cantilever Construction and Successive Launching- Precast segmental construction for long-span bridgescablesand their profiling - deck section - soffit surface -deflection and pre-camber - expansion joint - bearings - aesthetics. Cablestayedbridge construction - Construction methods - cable configuration - towers - multi span cable stayed bridges - stay tendons - aerodynamic stability.	8
	TOTAL HOURS	54

Term Work :

Term work shall be based on the above mentioned course content.

Reference Books:

1. Chew Yit Lin, Michael, Construction Technology for Tall Buildings (2ndEd.), Singapore University Press, World Scientific, HongKong, 2001.
2. Victor.D.J, Essentials of Bridge Engineering, Oxford IBH, 2001
3. Ponnuswamy.S, Bridge Engineering, Tata McGraw Hill, 1989.
4. Raina V.K. Concrete Bridge practice, Tata McGraw Hill Publishing Co., 1991
5. Derrick Beckett, An Introduction to Structural Design of Concrete Bridges, Surry University Press, Oxford Shire, 1973.
6. Fleming. W. G. K., et al., Piling Engineering, Surrey University Press, London, 1985.