

Branch Name:	Civil Engineering (Computer Aided Structural Analysis & Design)
Semester/Year:	Semester III/ Second Year
Subject Title:	Design of Tall Structures (Elective -III)
Subject Code:	2ET2060302T
Pre-requisite:	Design of concrete Structures, Design of steel structure

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
4	4	0	0	4	24	60	16	40	00	00	00	00	100

Course Objective:

1. With the rapid development of infrastructure facilities, large number of tall structures like tall buildings, chimneys, cooling tower, transmission line towers, microwave towers etc. are being designed and constructed across the globe.
2. The course on Design of Tall Structures acquaints the structural engineering students to analyze and design such structures as per Indian Standard code of practice.

Subject Contents				
Sr. No	Topic	Total Hours	Weightage (%)	
1	Tall Building: Structural systems for (a) floor systems (b) vertical load resisting systems (c) lateral load resisting systems, and (d) connections, Interaction of frames and shear wall, Twist of frames, Effects of opening, Analysis of coupled shear walls; Various methods of analysis like static linear/nonlinear, dynamic, buckling analysis, construction stage analysis etc.; Structural control and energy dissipation devices for tall building.	20	30	
2	Chimney: Design Factors, Stresses due to temperature, components, Platform and Safety ladders, Steel stacks, Refractory linings, Caps and foundation	06	20	
3	Cooling towers: types, components, design forces, analysis and design	08	25	
4	Transmission Line and Microwave towers: types of loads, Tower Configuration, Analysis and Design of towers	08	25	

List of Tutorials:

1. Case study on tall buildings of the world, India and Gujarat.
2. Design of tall structure based on the syllabus. The design report shall consist of full analytical treatment, design procedure, references and all necessary drawings in the form of neat dimensioned sketches.

Course Outcome:

After learning the course, the students should be able to design:

1. Tall buildings,
2. Chimney,
3. Design Cooling Tower,
4. Transmission Line towers and,
5. Microwave towers.

List of Reference Books

1. Tall buildings - B. S. Taranath, 2009
2. Handbook of Concrete Structures - Mark Fintel, 1975
3. Tall buildings - Coull and Smith, 1991
4. Design of Multi-storeyed structures - U. H. Variani, 2014
5. Tall Chimneys: Design & Construction - S. N. Manohar, 1985
6. Transmission Line Structures - Santhakumar & Murthy, 1991
7. IS:6533 (Part 2) –Code of Practice for Design and Construction of Steel Chimney
8. IS:4998 (Part 1)- Criteria for Design of Reinforced Concrete Chimneys.
9. IS: 4091 Code of Practice for Design and Construction of Foundations for Transmission Line Towers and Poles

Learning website:

<http://nptel.ac.in/>
<http://www.ctbuh.org/>
<http://www.emporis.com/>
<http://skyscrapercenter.com/>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Design a Tall buildings,	L-4 and L-5
CLO2	Design a Chimney	L-4 and L-5
CLO3	Design Cooling Tower,	L-4 and L-5
CL04	Design a Transmission Line towers and,	L-4 and L-5
CL05	Design a Microwave towers.	L-4 and L-5

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

Mapping of CLOs with POs & PSOs

	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
Course Learning Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CLO1	M	M	M	M	H	M		M	M			M	M	M	M
CLO2	M	M	M	M	H	M		M	M			M	M	M	M
CLO3	M	M	M	M	H	M		M	M			H	M	M	M
CL04	M	M	M	M	H	M		M	M			M	M	M	M
CL05	M	M	M	M	H	M		M	M			M	M	M	M

H: High, M: Medium, L: Low