

# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by  
NAAC with "A" Grade – 3.32 CGPA Recognized under 2(f) & 12(B) of UGC Act 1956,  
Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada  
Seetharampuram, W.G. DT, Narsapur-534280, (Andhra Pradesh)

### DEPARTMENT OF CIVIL ENGINEERING

### TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods/ Week	Academic Year	Date of commencement of Semester
20CE5T02	DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES (R20)	V	Civil Engineering	5	2023-24	03-07-2023

**COURSE OUTCOMES:** Upon completion of the course, Students are able to

1	Work on different types of design philosophies. K2
2	Carryout analysis and design of flexural members and detailing. K3
3	Design structures subjected to shear, bond and torsion. K3
4	Design different type of compression members and footings. K3
5	Design of different types of slabs and detailing. K3

UNIT	OutComes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO1: Work on different types of design philosophies. K2	1.1	Introduction to Reinforced concrete and reinforced concrete structures, Advantages and disadvantages of reinforced concrete	T1,R2	1	Chalk & Talk, PPT, Tutorial, Active learning
		1.2	Properties of concrete and steel	T1,R2	1	
		1.3	<b>Working stress method:</b> Design codes and handbooks, loading standards – Dead, live, wind and earthquake loads, Elastic theory: design constants, modular ratio	T1,R2	1	
		1.4	neutral axis depth and moment of resistance for	T1,R2	1	

			balanced, under-reinforced and over-reinforced sections.		
		1.5	Design of singly reinforced beams.	T1,R2	1
		1.6	Design of doubly reinforced beams.	T1,R2	1
		1.7	Limit State Design: Concepts of limit state design, Basic statistical principles	T1,R2	1
		1.8	Characteristic loads.	T1,R2	1
		1.9	Characteristic strength – Partial load and safety factors.	T1,R2	1
		1.10	Representative stress-strain curves for cold worked deformed bars and mild steel bars.	T1,R2	1
		1.11	Assumptions in limit state design, Stress - block parameters.	T1,R2	1
		1.12	Limiting moment of Resistance.	T1,R2	1
		<b>Total</b>			<b>12</b>
<b>II</b>	Co2: Carryout analysis and design of flexural members and detailing. K3	2.1	Limit state analysis and design of singly reinforced sections	T1,R2	1
		2.2	Effective depth, Moment of Resistance.	T1,R2	1
		2.3	Minimum depth for a given capacity, Limiting Percentage of Steel.	T1,R2	1
		2.4	Minimum Tension Reinforcement, Maximum Flexural Steel	T1,R2	1
		2.5	Design Problems on singly reinforced beams	T1,R2	1
		2.6	Limit state analysis and design of doubly reinforced beam sections.	T1,R2	1
		2.7	Design Problems on doubly reinforced beams	T1,R2	1
		2.8	Limit state analysis	T1,R2	1

Chalk & Talk, PPT, Tutorial, Active learning



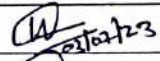
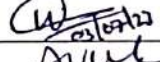
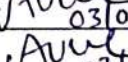
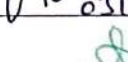
			and design of T-sections			
		2.9	Effective width of flange –Behaviour-Analysis and Design	T1,R2	1	
		2.10	Limit state analysis and design of L-sections	T1,R2	1	
		2.11	Effective width of flange –Behaviour-Analysis and Design	T1,R2	1	
		2.12	Design of Flanged Sections (T&L)	T1,R2	1	
		<b>Total</b>			<b>12</b>	
<b>III</b>	<b>CO 3: Design structures subjected to shear, bond and torsion. K3</b>	3.1	<b>Design for Shear, Torsion and Bond:</b> Limit state analysis and design of section for shear	T1,R2	1	Chalk &Talk, PPT, Tutorial, Active learning
		3.2	Design of section for shear and torsion	T1,R2	1	
		3.3	concept of bond, anchorage	T1,R2	1	
		3.4	concept of development length	T1,R2	1	
		3.5	I.S. Code provisions	T1,R2	1	
		3.6	Design examples in simply supported beams, detailing.	T1,R2	1	
		3.7	Design examples in continuous beams, detailing.	T1,R2	1	
		3.8	<b>Limit state design for service ability:</b> Deflection	T1,R2	1	
		3.9	Limit state design for service ability: Deflection, cracking.	T1,R2	1	
		3.10	IS code provision	T1,R2	1	
		3.11	Design of beams (Design for flexure, shear. Checking for limiting Deflection)	T1,R2	1	
		3.12	Design of beams (Design for flexure, shear. Checking for limiting Deflection)	T1,R2	1	
		<b>Total</b>			<b>12</b>	
		4.1	<b>Design of Compression members:</b> Effective length of a	T1,R2	1	

<b>IV</b>	<b>CO 4 : Design different type of compression members and footings. K3</b>		column			Chalk &Talk, PPT, Tutorial, Active learning
		<b>4.2</b>	Design of short columns- under axial loads, uniaxial bending	<b>T1,R2</b>	<b>1</b>	
		<b>4.3</b>	Design of short columns- under axial loads, and biaxial bending	<b>T1,R2</b>	<b>1</b>	
		<b>4.4</b>	Design of long columns- under axial loads, uniaxial bending	<b>T1,R2</b>	<b>1</b>	
		<b>4.5</b>	Design of long columns- under axial loads and biaxial bending	<b>T1,R2</b>	<b>1</b>	
		<b>4.6</b>	Braced columns, Unbraced columns, IS code provisions	<b>T1,R2</b>	<b>1</b>	
		<b>4.7</b>	<b>Footings:</b> Different types of footings, Design of isolated and combined footings-rectangular footings subjected to axial loads	<b>T1,R2</b>	<b>1</b>	
		<b>4.8</b>	Rectangular footings subjected to axial loads, uni-axial bending moments.	<b>T1,R2</b>	<b>1</b>	
		<b>4.9</b>	rectangular footings subjected to axial loads, bi-axial bending moments	<b>T1,R2</b>	<b>1</b>	
		<b>4.10</b>	Design of isolated and combined footings- circular footings subjected to axial loads	<b>T1,R2</b>	<b>1</b>	
		<b>4.11</b>	Design of isolated and combined footings- circular footings subjected to axial loads, uni-axial bending moments.	<b>T1,R2</b>	<b>1</b>	
		<b>4.12</b>	Design of isolated footings- circular footings	<b>T1,R2</b>	<b>1</b>	



			subjected to axial loads and bi-axial bending moments.			
V	CO 5: Design of different types of slabs and detailing. K3	5.1	Slabs: Classification of slabs	T1,R2	1	Chalk &Talk, PPT, Tutorial, Active learning
		5.2	design of one - way slabs	T1,R2	1	
		5.3	Design problems one way slab using IS Coefficients	T1,R2	1	
		5.4	design of two - way slabs simply supported	T1,R2	1	
		5.5	Design of two - way slabs-simply supported and various edge conditions using IS Coefficients	T1,R2	1	
		5.6	Design of two - way slabs-simply supported and various edge conditions using IS Coefficients	T1,R2	1	
		5.7	Design of two - way slabs-simply supported and various edge conditions using IS Coefficients	T1,R2	1	
		5.8	Design problems on two way slabs	T1,R2	1	
		5.9	Design problems on two way slabs	T1,R2	1	
		5.10	Design of waist-slab staircase	T1,R2	1	
		5.11	Design problems on waist-slab staircase	T1,R2	1	
		5.12	IS code provisions	T1,R2	1	
		Total				
CUMULATIVE PROPOSED PERIODS					60	
Text Books:						

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	S.S.Bhavikatti, 'Design of RCC Structural elements', 5 <sup>th</sup> Edition, New age international publishers, 2020.
2	A. K. Jain, 'Limit State Design', 7 <sup>th</sup> Edition, Nem Chand & Brothers-Roorkee, 2012
3	N. Subrahmanyian, 'Design of Reinforced concrete Structures', 4 <sup>th</sup> Edition CBS Publishers and Distributors Pvt Ltd, 2019
4	S. Unnikrishna Pillai & Devdas Menon 'Reinforced Concrete Structures', 3 <sup>rd</sup> Edition, Tata McGraw Hill, New Delhi, 2017.
<b>Reference Books:</b>	
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Arthus H. Nilson, David Darwin, and Charles W. Dolar, 'Design of concrete structures', 3rd Edition, Tata McGraw Hill, 2005.
2	Park and Pauley, John Wiley and Sons, 'Reinforced Concrete Structures', John Wiley & Sons, Inc.
<b>Code Books:</b>	
S.No.	Code Book
1.	IS 456 : 2000
2.	IS 875
3.	SP : 16
<b>Web Details</b>	
1	<a href="https://nptel.ac.in/courses/105/105/105105105/">https://nptel.ac.in/courses/105/105/105105105/</a>

	Name	Signature with Date
i. Faculty	D.Satish	 03/07/23
ii. Course Coordinator	D.Satish	 03/07/23
iii. Module Coordinator	A.Venkata Krishna	 03/07/23
iv. Programme Coordinator	A.Venkata Krishna	 03/07/23

  
Principal