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 OFCIVIL 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'sLevel	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	**Working stress method**: 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	
				Total	**12**	
II	**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**	Chalk &Talk, PPT, Tutorial, Active learning
		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**	

			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	
				Total	**12**	
III	**CO 3:** Design structures subjected to shear, bond and torsion. K3	3.1	**Design for Shear, Torsion and Bond**: 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	**Limit state design for service ability**: 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	
				Total	**12**	
		4.1	**Design of Compression members:** Effective length of a	T1,R2	1	

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

			subjected to axial loads and bi-axial bending moments.			
				Total	12	
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 slabusing 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	12	
			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', 5th Edition, New age international publishers, 2020.
2	A. K. Jain ,'Limit State Design',7th Edition,Nem Chand & Brothers-Roorkee, 2012
3	N. Subrahmanyian ,'Design of Reinforced concrete Structures',4th EditionCBS Publishers and Distributors Pvt Ltd, 2019
4	S. UnnikrishnaPillai&DevdasMenon 'Reinforced Concrete Structures',3rd Edition, Tata McGraw Hill, New Delhi, 2017.
Reference Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1	ArthusH.Nilson, David Darwin, and Chorles W. Dolar, 'Design of concrete structures', 3rd Edition, Tata McGrawHill, 2005.
2	Park and Pauley, John Wiley and Sons, 'Reinforced Concrete Structures', John Wiley & Sons, Inc.
Code Books:	
S.No.	**Code Book**
1.	IS 456 : 2000
2.	IS 875
3.	SP : 16
Web Details	
1	*https://nptel.ac.in/courses/105/105/105105105/*

		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