PNS SCHOOL OF ENGINEERING &TECHNOLOGY

LESSION PLAN

BRANCH-CIVIL	SEMESTER-4TH	NAME OF THE FACULTY-ER.DEVIPRASAD BISWAL
SUBJECT-STRUCTURAL DESIGN 1	NO OF DAYS PER WEEK -6 CLASS ALLOTTED-75	SEMESTER FROM 13.02.2023 TO 24.05.2023
WEEK	CLASS DAY	THEORY TOPICS
FEBRUARY(3RD)	1ST(2CLASSES)	**Working stress method (WSM)** Objectives of design and detailing. State the different methods of design ofconcrete structures
	3RD(2CLASSES)	Introduction to reinforced concrete, R.C. sections their behavior, grades ofconcrete and steel. Permissible stresses, assumption in W.S.M
	5TH	Flexural design and analysis of single reinforced sections from first principles
4TH	1ST(2CLASSES)	Concept of under reinforced, over reinforced and balanced sections.
	3RD(2CLASSES)	Advantages and disadvantages of WSM, reasons for its obsolescence
	5TH	**Philosophy Of Limit State Method (LSM)** Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy.
	6TH	Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S. 875
5TH	1ST(2CLASSES)	Study of I.S specification regarding spacing of reinforcement in slab, cover toreinforcement in slab, beam column & footing, minimum reinforcement in slab,
MARCH(1ST)	3RD(2CLASSES)	beam & column, lapping, anchorage, effective span for beam & slab.
	5TH	**Analysis and Design of Single and Double Reinforced Sections (LSM)**
	6TH	Limit state of collapse (flexure), Assumptions
2ND	1ST(2CLASSES)	, Stress-Strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram forsingly reinforced section.

	5TH	Concept of under- reinforced, over-reinforced and limiting section,
3RD	1ST(2CLASSES)	neutral axisco-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section
	3RD(2CLASSES)	Analysis and design: determination of design constants, moment of resistanceand area of steel for rectangular sections
	5TH	Necessity of doubly reinforced section, design of doubly reinforced rectangularsection
	6TH	**Shear, Bond and Development Length (LSM)**
4TH	1ST(2CLASSES)	Nominal shear stress in R.C. section, design shear strength of concrete,
	3RD(2CLASSES)	maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement.
	5TH	Bond and types of bond, bond stress, check for bond stress, developmentlength in tension and compression
	6TH	anchorage value for hooks 900 bend and 450 bend standards lapping of bars, check for development length
5TH	1ST(2CLASSES)	3 Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear
	3RD(2CLASSES)	Design of shear reinforcement; Minimum shear reinforcement in beams (Explain throughexamples only).
	5TH	**Analysis and Design of T-Beam (LSM)**
APRIL(2ND)	1ST(2CLASSES)	General features, advantages, effective width of flange as per IS: 456-2000code provisions
	3RD(2CLASSES)	Analysis of singly reinforced T-Beam, strain diagram & stress diagram,
	6TH	, depthof neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange
3RD	1ST(2CLASSES)	Simple numerical problems on deciding effective flange width.
	3RD(2CLASSES)	(Problems onlyon finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination)..
	6TH	**Analysis and Design of Slab and Stair case (LSM)**

4TH	1ST(2CLASSES)	Design of simply supported one-way slabs for flexure check for deflection control and shear
	3RD(2CLASSES)	Design of simply supported one-way slabs for flexure check for deflection control and shear
	6TH	Design of two-way simply supported slabs for flexure with corner free to lift.
5TH	1ST(2CLASSES)	Design of dog-legged staircase
	3RD(2CLASSES)	Detailing of reinforcement in stairs spanning longitudinally.
	5TH	**Design of Axially loaded columns and Footings (LSM)**
	6TH	Design of Axially loaded columns and Footings (LSM)
MAY(1ST)	1ST(2CLASSES)	Definition and classification of columns,
	3RD(2CLASSES)	effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular
	6TH	square and circular sections, diameter and spacing of lateral ties
2ND	1ST(2CLASSES)	Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only)
	3RD(2CLASSES)	Types of footing
	5TH	Design of isolated square column footing of uniform thickness for flexure and shear.
	6TH	REVISION
3RD	1ST(2CLASSES)	REVISION
	3RD(2CLASSES)	REVISION
	5TH	PREVIOUS YEAR QUESTION DISCUSSION
	6TH	PREVIOUS YEAR QUESTION DISCUSSION
4TH	1ST(2CLASSES)	PREVIOUS YEAR QUESTION DISCUSSION
	3RD(2CLASSES)	PREVIOUS YEAR QUESTION DISCUSSION

Deviprasad Biswal

SIGN OF LECTURE

Sudeepta Mishra

SIGN OF HOD