NPAT UNIVERSITY

FACULTY OF ARCHITECTURE DESIGN & PLANNING

Programme	Bachelor of Design	Branch/Spec.	INSTITUTE OF DESIGN
Semester	II	Version	3.0.0.0
Effective from Academic Year	2021-22	Effective for the batch Admitted in	June 2021
Subject code	3IIA05STR	Subject Name	STRUCTURE - II

Teaching scheme						Examination scheme (Marks)				
(Per week)	Lecture(DT)		S/W/T		Total		CIE	SE	UE	Total
	L	TU	S/W/T	TW						
Credit	2	-	-	-	2	Theory	40	20	40	100
Hours	2	-	-	-	2	Jury/Viva/TW	-	-	-	-

Objective:

- The emphasis of the course is on "structural construction systems."
- The course develops a comprehensive understanding of construction and behaviour of structural components based on material property, size and shape.
- Concepts of stress, strain and basic structural analysis are to be understood with reference to properties of materials.

Learning Outcome:

LO1: Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.

LO2: Students are taught basic geometric properties and the behaviour of materials under effect of forces.

LO3: Analyse the bending moment and shear force acting on simple structures and draw SFD and BMD.

LO4: Learn Basics of Structural Analysis: i.e. Understand material properties and stresses induced in various structural components like, beams, columns, trusses etc along with its behaviour

CONTENT & TEACHING UNITS

Unit	Content	HRS
A	Simple stresses & Strains: Basics of stress and strain, Normal/axial stresses & strains- Tensile, compressive & shear. Hooke's law & Modulus of elasticity. Application of stress & strains.	6
B	Stresses in Beams: (a) Flexural stresses – Theory of simple bending, Assumptions, neutral axis, determination of bending stresses, section modulus of rectangular & circular (solid & hollow), I,T, Angle, channel sections. (b)Shear stresses – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T, angle sections.	6
C	Columns and Struts: Buckling of columns, different end conditions, effective length, least radius of gyration, Euler's and Rankine's formula, Behaviour of columns under lateral loading. Columns subjected to eccentric loads, middle third rule & its importance (for columns, retaining walls & dams etc. structures).	8
D	Deflection in beams: Introduction to deflection of simple beams by basic formulas.	8
E	Analysis of continuous & fixed beams: shear force & bending moment diagram by simple method (moment distribution method).	8

Text Books

1	
Reference Books	
1	Junarkar S.B. & Shah H.J., 2012. Mechanics of Structures Vol-I. Charotar publishing house, Anand.
2	Wang C. K., 1982. Intermediate Structural Analysis. Tata McGraw Hill book Company, New Delhi.
3	Ryder G.H, Mcmillan Gere & Timoshenk. Strength of Materials, Mechanics of Materials. CBS Publishers & Distributors, Delhi.

Note: Continuous Internal Evaluation shall be divided into A. 20% -Attendance B. 80% -Periodic Evaluation

CIE- Continuous Internal Evaluation, SE-Summative Evaluation (Jury/Viva/TW/Theory Exam), UE- University Exams (Jury/Viva/TW/Theory Exam