		School of Planning and Architecture: Vijayawada		
		(An Institution of National Importance under the Ministry of Education, Govt. of India)		
		Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India		
			Department of Architecture	
	Course:	**ARC 214; Structural Mechanics**		**Class:** II Yr B.Arch I Sem A.Y. 2024-25
	Instructors:	Dr. P. Siva Prasad		**Internal Assessment:** 50
				External Theory Exam: 50
	Contact Periods/ week: 04 periods (55 min each)			**Total Marks:** 100
	Time Table:			**Credits:** 4
	Attendance: Min 75%		**Min. Passing Marks:** 50% each in Internal & External Assessment, 50% in Aggregate	
	Objective: To impart the knowledge of methods of determining Centroid, Moment of Inertia, Bending stresses, forces in Arches, deflection in beams and also plotting shear force and bending moment diagrams			
	Out Line of the Course:			
			LECTURE PLAN	
	WEEK	**DATE**	**TOPIC OF CLASS LECTURE & DISCUSSION**	**TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS**
	1	Week-1	Introduction and determination of Centre of gravity of various structural shapes	Lecture & discussion
	2	Week-2	Introduction and determination of Moment of inertia, Section modulus of various structural shapes	Lecture & discussion
	3	Week-3	Types of beams and their behaviour, types of supports and reactions, bending moment & shear Forces	Lecture & discussion
	4	Week-4	SFD & BMD for simply supported, cantilever and overhanging beams,Relation between bending moment and shear force	Lecture & discussion
	5	Week-5	Assumptions made in the theory of simple bending. Applications of pure bending equation, Determination of different types of stresses induced in beams and shafts due to bending and twisting moments respectively	Lecture & discussion
	6	Week-6	Bending stresses and shearing stresses in beams, distribution of shear stress over rectangular, circular, triangular, I and T-sections	Lecture & discussion
	7	Week-7	**Internal Assessment -1**	**Internal Assessment -1**

	8	Week-8	Understanding structural concepts of post & lintel, arch, dome, & vault construction	Lecture & discussion
	9	Week-9	Two hinged arches and Three hinged arches	Lecture & discussion
	10	Week-10	Behaviour of heterogeneous material in direct force and bending	Lecture & discussion
	11	Week-11	Deflections of cantilever beams with different loading conditions	Lecture & discussion
	12	Week-12	**Mid-Semester examination**	**Mid-semester examination**
	11	Week-13	Deflections of simply supported beams with different loading conditions, Relation between slope and deflection	Lecture & discussion
	12	Week-14	Tension test on steel bars, Torsion test on steel bars, Determination of the fineness of cement, Determination of consistency of cement	Lecture & Demo
	13	Week-15	Study of strain recording, Voids ratio and porosity of sand, Bulk density and specific gravity of Fine aggregate, Bulk density and specific gravity of Coarse aggregates	Lecture & Demo
	14	Week-16	**Internal Assessment -3**	**Internal Assessment -3**

	S. No.	**Stages of Evaluation**	**Weightage**
	1	First stage: Assessment –1	15
	2	Second stage: Mid-semester Examination	20
	3	Third stage: Assessment –3	15
		Total	50

Reference Books: 1. Bansal, R. K. Engineering Mechanics. New Delhi :Laxmi Publications.
2. Junnarkar, S. B. (1991). Mechanics of Structures. Vol. 1. 20thEd. Delhi :Charotar.
3. Kurmi, R. S. Strength of Materials. New Delhi : S. Chand & Company.
4. Mukherjee, S. Elements of Engineering Mechanics. New Delhi : PHI Learning.
5. Ramamrutham, S. (2008). Engineering Mechanics: A Textbook of Applied Mechanics. DhanpatRai Publishing.
6. Vazirani and Ratwani. (2008). Analysis of Structures. Vol. I. New Delhi: Khanna Publishers.

	Cource Instructor: (Dr. P. Siva Prasad)	**Head of Department :** (Dr. D. Srinivas)