

Devi Ahilya Vishwavidhyalaya, Indore, India			
Institute of Engineering & Technology			
Subject Code and Name	Type	L-T-P	Credits
7VLRG5: Structural Analysis – II	L	T	P
	PC	3-1-1	4+1(P)

COURSE CONTENTS

Unit I: Force Method: Consistent Deformation Method – General Concept – Application to Truss subjected to Loads – Application of Clapeyron’s Theorem of Three Moments to fixed and continuous beams – Temperature, Lack of fit, Settlement of Support – effects in structures

Unit II: Analysis of tall frames, wind and earthquake loads, codal provisions for lateral loads. Approximate analysis of multistory frames for vertical and lateral loads.

Unit III: Matrix Methods of Structural Analysis: Basic structural principles. static and kinematics indeterminacies of a structure, flexibility and stiffness matrices, flexibility and stiffness influence coefficients. Matrix Force (Flexibility) Method: Basic principles - choice of redundants - released structure - application of fixed beams, continuous beams and portal frame upto two degrees static indeterminacy. Matrix Displacement (Stiffness) Method: Concept of stiffness method - restrained structure - applications to continuous beams and portal frames upto two degrees of kinematic indeterminacy.

Unit IV: Influence lines for intermediate structures, Muller Breslau principle, Analysis of Beam-Columns. Plastic analysis of beams and frames.

Unit V: Introduction to Structural Dynamics

Free Vibration damped - undamped vibrations for Single degree of freedom system – Forced vibration - displacement and force isolation.

Reference Books :-

1. Wang C.K. Intermediate structural analysis, McGraw Hill, New York.
2. Kinney Streling J. Indeterminate structural Analysis, Addison Wesley.
3. Reddy C.S., Basic Stgructural Analysis, Tata McGraw Hill Publishing Company, New Delhi.
4. Norris C.H., Wilbur J.B. and Utkys. Elementary Structural Analysis, McGraw Hill International, Tokyo.
5. Weaver W & Gere JM, Matrix Methods of Framed Structures, CBS Publishers & Distributors, Delhi
6. Junarkar. S. B and Shah H.J- Mechanics of Structures Vol 1 & Vol.2 – 27th Edition, Charotar Publishers, 2008.
7. Mario Paz, Structural Dynamics-Theory and Computation, 2nd Edition, CBS Publishers, 2010.

Course Outcome:

Students who earned credits will develop ability to

CO. No.	CO	PO
CO1	Apply the knowledge of force methods for analysing indeterminate beams	PO-1, PO-5
CO2	Apply the knowledge of matrix method in analysis of structures	PO-2, PO-3, PO-4
CO3	Apply the concept of Plastic analysis of beams and frames	PO-1, PO-3, PO-7
CO4	Use the concept of vibrations in dynamics of structures	PO-2, PO-3, PO-4, PO-5

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	3				3							
CO2		2	3	3								
CO3	2		3				2					
CO4		2	3	3	2							