STRUCTURAL DYNAMICS

Course Code: 13CE 2203

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Course Outcomes:

At the end of the course the student will be able to

CO1 : Analyse a single degree of freedom system.

CO2 : Analyse the structural response to external forces.

CO3 : Discuss Coulomb's damping and viscous damping and their differences.

CO4 : Estimate the natural frequency and characterises shapes of multi degree freedom system.

CO5 : Describe the mode superposition adopting various approaches.

UNIT – I

Single degree of freedom system: Natural Vibration, time period, amplitude, various force functions, Response to undamped & damped system.

UNIT – II

Single degree of freedom system: Forced vibration, Response to damped & undamped, Response to pulsating force, Support motion (Transmissibility).

UNIT – III

Single degree of freedom system: Coloumb damping, Viscous damped for harmonic vibration & frequency response curve.

UNIT – IV

Multi degree freedom system: Determination of natural frequency, characteristic shapes for undamped system, orthogonality of natural modes and normal coordinates.

UNIT – V

Methods of combining modes: Mode superposition method, Modal truncation errors-Modal Acceleration method, Direct Integration methods, Explicit and Implicit methods.

TEXT BOOKS:

1. Chopra A. K., *"Dynamics of Structures"*, 3rd Edition, Pearson edition, 2007.

2. Mario Paz, William Leigh., "*Structural Dynamics: Theory and Computation"*, 5th edition, Springer. 2003.

REFERENCES:

1. Raymond W. Clough, Joseph Penzien , *"Dynamics of Structures",* Mc Graw-Hill Book Company.

2. W. Weaver, Jr., S. P. Timoshenko, D. H. Young. "*Vibration Problems in Engineering"* , 4th Edition. 2010.

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