J.S. University, Shikohabad

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Value Added Course

(Earthquake Resistant Design & Construction)

Faculty of CIVIL ENGINEERING

	J.S. University, Shikohabad Faculty of Civil Engineering	Value Added Course
		AY: 2019-20

Earthquake Resistant Design & Construction

Learning Objective:

This Course will provide knowledge of Earthquake resistant design and construction.

Duration: 30 Hours. (Theory and Practical)

Course Outcomes: -

Maximum Exposure has to be given on Practical Oriented

On successful completion of the course students will be able to:

1: Discuss the equations of motion for undamped free vibrations for SDOF and 2DOF systems

2:Explain the engineering seismology including causes and effects of earthquakes

3:Analyse amulti-storeyed structure using Equivalent Static Method and Response Spectrum methods

4:Assess various irregularities in buildings

5:Apply the provisions of IS:13920 and IS: 4326 to building structures

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Syllabus Outline

1. **Module-1**

   Introductory Seismology.

   Earthquake recording, Seismic instruments, Seismographs & Seismograms. Basic concept of liquefaction and isolation.. Structural systems, Effects of earthquake on buildings in general, structural and nonstructural failures. Dynamic characteristics of buildings, natural period of vibration, damping, stiffness etc. Typical failure mechanism of masonry buildings under earthquakes.

2. **Module-2**

   Planning consideration

   Architectural concept, provisions for earthquake resistant construction/ seismic strengthening of masonry constructions. Seismic performance of reinforced concrete buildings. Plan, elevation & stiffness irregularities & their effects. Typical earthquake damages of RC constructions, short column effect, soft storey effect, strong column-weak beam analogy.

3. **Module-3**

   Seismic design philosophy

   IS 1893 (part I):2002 codal provisions : Load combinations, Design lateral loads, response reduction factors, structural modeling of building frames, equivalent load method for earthquake analysis of multistory frames.

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References:-

1) "Earthquake resistance design of structure" by Duggal- Oxford University Press.
2) "Dynamics of structure" by Clough R.W. and Penzin J. ...
3) "Dynamics of structure" by Anil Chopra, Prentice Hall India Publication.
4) "Dynamics of structure" by Mario Paz, CBSPD Publication.

(Name of Faculty)	(Name of Faculty)	(Name of Faculty)
Course Coordinator	Dean Academics	Director/Principle/Dean of Faculty/Department
Miss. Akanksha Dixit	Dr. Akhilesh	Er. Anil Yadav