INTRODUCTION TO ENGINEERING SEISMOLOGY

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PRE-REQUISITES : XII Standard

INTENDED AUDIENCE : Civil Engineering, Geology, Engineering Science, GeoPhysics, Earthquake Engineering

INDUSTRY SUPPORT : Any Company involved on seismic related studies

COURSE OUTLINE :

Introduction to Engineering Seismology is general course for anyone interested to know about earthquake. Initial part of study discusses about different seismic hazard, global seismicity and risk. Further gives theory behind earthquake, plate tectonics and seismic courses and fault. Theory of wave propagation and different types of earthquakes can also discuss in the course. Couse also covers quantification of earthquake size: Concept of Intensity and Magnitude; different earthquake scales. Seismic instruments, earthquake data and interpretation of seismic data. Source mechanism and simple source model differ predictive equations in seismology and Seismic hazard estimation with examples. Taking this course will help to understand earthquake hazard and know seismic optional of the region and better way of estimating the future seismic hazard.

ABOUT INSTRUCTOR :

Prof. Anbazhagan P started his research on Engineering Seismology during his B.E project, continued all his research in the same area up to his PhD. After Joining at IISc, he offered new Course on Engineering Seismology, where basic about earthquakes and application research are being taught to students. He also do research on several section of engineering seismology and published more than 75 papers, which he also included in my teaching course.

COURSE PLAN :

Week 1: Introduction to earthquake hazards- Global seismicity and Seismic risk. History of Engineering Seismology and Earthquake types

Week 2: Elastic Rebound Theory; Earthquake sources; Plate tectonics, and Plate Boundaries: Continental Drift

Week 3: Theory of Wave Propagation Seismic wave propagation, Types of seismic waves, Wave chanters and Shadow zones

Week 4: Concept of Earthquake Measurement, Seismic Intensity and Magnitudes Scales. Past earthquake Energy and Comparable Explosive tests

Week 5: Earthquake Instruments, Sensors and Data Loggers, Mechanical and Digital sensors; Seismic Station

Week 6: Interpretation of Seismic Records: Identification of made events and natural earthquake; Time and frequency domain characteristic of ground motion

Week 7: Regional Seismicity, Earthquakes in India and Most important Global Earthquakes; Concept of Seismic Zonation and Methodology for Seismic microzonation

Week 8: Predictive Models in Earthquake Engineering- Attenuation Relation; Intensity, Duration and Ground Motion Predictive Relation

Week 9: Earthquake Catalog preparation, Source Map preparation; Homogenization and Declustering of earthquake data and preparation of Seismotectonic maps

Week 10: Seismic Hazard Parameters: a and b values, Recurrence relations and Maximum magnitude: Region Specific Approach for estimation Parameters and Selection of predictive equations

Week 11: Seismic Hazard Analysis: Deterministic and Probabilistic Methods; Rupture based approach

Week 12: Seismic Hazard Analysis Case studies and Worked examples