

SYLLABUS

CE 767 Earthquake Engineering

Spring 2018

Instructor:

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Textbook: Dynamics of Structures: theory and Applications to Earthquake Engineering, A. Chopra. (3rd Ed or after, others OK). If you are unfamiliar with MATLAB, then an introductory MATLAB text is recommended.

Class: Scheduled T/Th. 9:30-10:45, Engineering E106.

Office Hours:

TTh 11:00-12:30

Grading:

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| Paper Reviews and Seminar Attendance/Summary | 10% |
| Homework | 10% |
| Earthquake Toolbox (MATLAB) | 20% |
| Project | 20% |
| Midterm Exam | 20% |
| Final Exam | 20% |
| Total | 100% |

Homework will be assigned in class or via email.

Project presentations will be given the last week of classes.

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| Subject Covered |
| MATLAB (Tutorial provided for hwk) |
| Causes of earthquakes |
| Historical earthquakes |
| Seismicity |
| Fault types |
| Richter Scale |
| MMI Scale |
| Derivation of the Equation of Motion |
| Free vibration of SDOF systems |
| Forced vibration of SDOF systems |
| Harmonic Forcing Functions for SDOF systems |
| Earthquake response of linear systems |
| Response spectrum |
| Elastic design spectrum |
| Earthquake response of inelastic SDOF systems |
| Energy dissipation |
| Constant-ductility response spectra |
| Inelastic design spectra |
| Applications of design spectra |
| Experiments in EQ Engineering (Lab intro) |
| Incremental dynamic analysis (IDA) |
| Equivalent lateral force procedure |
| Response spectrum analysis |
| Basic FEA approach |
| Energy dissipation |

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| Constant-ductility response spectra |
| Inelastic design spectra |
| Earthquake response of linear buildings (MDOF) |
| Earthquake response of inelastic buildings (MDOF) |
| Soft story buildings |
| Power spectral density |
| Intro to Performance-based seismic design |
| Intro to Seismic Resilience |
| Intro to Community Resilience |
| Community Resilience Modeling |
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| Seminars Being Planned |
| Resilient Wood Buildings |
| Tsunamis |
| Earthquake Data Reconnaissance |
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