COURSE DESCRIPTION

A. GENERAL

1. Course: Architecture 573, 2 units
2. Title: Seismic Design
3. Class meetings: Tues 1:00-2:50 pm, HAR 102
4. Examinations: Final Exam
5. Student hours: 2 hours class, 4 hours non-class per week
6. Prerequisite: ARCH 213a and ARCH 213b, or equivalent
7. Office Hours TBD, andersca@usc.edu, WAH 309

B. OBJECTIVES

Develop informed intuition for structural lateral systems strategies and layout required for seismic design. Understand the characteristics of earthquakes and the systems that resist them. Integrate seismic design into the overall architectural design of buildings including the detailing requirements for structural and nonstructural components. NAAB student performance criteria for this course includes Structural Systems and Sustainability.

C. SUBJECT MATTER

Earthquakes and how they influence building design will be the subject of this course. Students will learn about the earth science behind earthquakes and the fundamentals of the physics and behavior of structural systems designed to resist earthquake motions. System and material selection for seismic design considering the structure, façade, and nonstructural components will be explored to help the student make informed decisions about seismic design.

D. ASSIGNMENTS

Students are expected to parallel lectures with related readings, exercises, experiments, homework assignments and term projects. There will also be a Final Exam.

E. BASIS FOR COURSE GRADE

Subject	Percentage of grade
Homework & Exercises & Experiments	40%
Term Project	30%
Final Exam	30%
Total	100%

To pass the course students must pass the Final and miss not more than two classes without valid written excuses (see attached Attendance Guidelines for further information)**.**

F. COURSE OUTLINE

	Introduction to Seismic Design
Week 1	Introduction to course objectives, earth science basics: how the earth moves, the nature of earthquakes
Week 2	Earthquake effects: shaking, liquefaction, damage to buildings and infrastructure
	Lateral Force Resisting Systems
Week 3	Loading and behavior, deformations, dynamics, load path and resultant forces
Week 4	Overview of systems and materials and impact on design
	Lessons Learned from Major Earthquakes
Week 5	Do's and don'ts of design in seismic country, societal impact and earthquake preparedness
Week 6	Earthquake prediction and code changes due to earthquakes, performance based design
Week 7	Nonstructural response: facades, ceilings, equipment

	Lateral System Integration
Week 8	Reinforced concrete and masonry systems: selection, layout and sizes
Week 9	Concrete systems: impact on non-structural elements, facades and detailing
Week 10	Steel systems: selection, layout and sizes
Week 11	Steel systems: impact on non-structural elements, facades, and detailing
Week 12	Wood systems: selection, layout and sizes
Week 13	Wood systems: impact on non-structural elements, detailing
Week 14	Supplemental systems: base isolation, dampers and friction systems
Week 15	*Term Project Due* Retrofit strategies: maintaining functionality and preserving design Study Week
	Final Exam, Wednesday, May 11, 2pm – 4pm

G. REQUIRED TEXT FEMA (2006) *Designing for Earthquakes; A Manual for Architects*, FEMA. (Free download from http://www.fema.gov/library/viewRecord.do?id=2418)

Resource books

ASCE 7 (2005) *Minimum Design Loads for Buildings and Other Structures*, ICC

Bolt (2006) *Earthquakes* (any edition 1-5), W. H. Freeman.

Garcia, Bain and Paul (2001) *Earthquake Architecture: New Construction Techniques for Earthquake Prevention*, Paco Asensio.

IBC (2006) *International Building Code*, ICBO (International Conference of Building Officials).

Lewis, Ulin, et al (2009) *The L.A. Earthquake Sourcebook*, Designmatters at Art Center College of Design.

Schierle (2008) *Structure and Design,* University Readers.

Yeats (2001) *Living with Earthquakes in California: A Survivor's Guide*, Oregon State University Press.

H. UNIVERSITY STANDARDS

Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus,* the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

The USC School of Architecture's two year M.ARCH degree is an accredited professional architectural degree programs. All students can access and review the NAAB Conditions of Accreditation (including the Student Performance Criteria) on the NAAB Website:
http://www.naab.org/accreditation/2009_Conditions.aspx