A. GENERAL
1. Course: Architecture 573, 2 units
2. Title: Seismic Design
3. Class meetings: Tues 12:00-1:50 pm, WAH B1, "Watt One"
4. Examinations: Final Exam
5. Student hours: 2 hours class, 4 hours non-class per week
6. Prerequisites: ARCH 213a and ARCH 213b, or equivalent
7. Office Hours Monday and Friday, 12-2 pm, 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.

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

<table>
<thead>
<tr>
<th>Subject</th>
<th>Percentage of grade</th>
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<tbody>
<tr>
<td>Homework &amp; Exercises &amp; Experiments</td>
<td>30%</td>
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<tr>
<td>Term Project 1</td>
<td>20%</td>
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<tr>
<td>Term Project 2</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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To pass the course students must pass the Final and miss not more than two classes without valid written excuses.

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 | Term Project 1 Due | Wood systems: selection, layout and sizes |
| Week 9 | Wood systems: impact on non-structural elements, detailing |
| Week 10 | Steel systems: selection, layout and sizes |
| Week 11 | Steel systems: impact on non-structural elements, facades, and detailing |
| Week 12 | Reinforced concrete and masonry systems: selection, layout and sizes |
| Week 13 | Concrete systems: impact on non-structural elements, facades and detailing |
| Week 14 | Supplemental systems: base isolation, dampers and friction systems |
| Week 15 | Term Project 2 Due |
|        | Retrofit strategies: maintaining functionality and preserving design |

**Study Week**

**Final Exam**

## G. REQUIRED TEXT


- **Resource books**
  - **Schierele (2008)** *Structure and Design*, University Readers.

## 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/](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/](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: