

**CE 207L****Introduction to Design of Structural Systems 2 Units**

USC | SONNY ASTANI DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

*ABET Course Syllabus***Course Information, Textbook and Supplementary Materials**

**Course Description:** Structural materials, components and systems; gravity and lateral forces; structural performance and failures; introduction to structural plans and analysis; computer applications, case studies, design project.

**Required for:** BSCE, BSCE Structural, and BSCE Building Science

**Prerequisites:** CE 107 Introduction to Civil Engineering Graphics  
CE 205 Statics

**Co-Requisite:** CE 225 Mechanics of Deformable Bodies

**Required Textbook:**

*Simplified Engineering for Architects and Builders*, James E. Ambrose and Patrick Tripeny, Wiley, John & Sons, Inc., Edition 10, December 2005

**Reference:** (material distributed in class)

Topics Covered	Learning Outcomes
Analyzing and designing structural systems	Students will know the basics of design and analysis regarding these topics: <ol style="list-style-type: none"> <li>1. Ethics in structural design</li> <li>2. Learning from structural failures</li> <li>3. Determination of dead and live loads</li> <li>4. Structural framing systems</li> <li>5. Lateral force resisting systems</li> <li>6. Structural dynamics of buildings</li> <li>7. Wind forces</li> <li>8. Seismic forces</li> <li>9. Irregular structures</li> <li>10. Distribution of forces based on rigidity</li> <li>11. Determine wind and seismic forces on buildings.</li> <li>12. Determine building code requirements for structural systems</li> </ol>
Factors affecting existing and new structural systems	<ol style="list-style-type: none"> <li>13. Recognize characteristics of different structural systems.</li> <li>14. Recognize that seismic safety is affected by choice of structural system and degree of structural</li> </ol>
The process of structural design	<ol style="list-style-type: none"> <li>15. Recognize that ethical issues are involved in decision process</li> <li>16. Develop and organize design calculations for a building</li> </ol>

<b>Lecture and Lab Schedule</b>			
<b>Lecture</b>		<b>Lab</b>	
Sessions per Week	Duration per Session	Sessions per Week	Duration per Session
2	1.5 hours	1	1.5 hours

**Relation of Course Objectives to Program Outcomes**

The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.

This course contributes to the program outcomes as outlined in the adjacent table.

<b>Course Contribution to Program Outcomes (a-k)</b>	<b>Key</b>
c. An ability to design a system component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	✓
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

**Prepared by:** Dr. Navid Nastar

**Reviewed:**     Fall 2014