THE PENNSYLVANIA STATE UNIVERSITY
Department of Architectural Engineering

AE 432 – DESIGN & THEORY OF MASONRY STRUCTURES

Semester: Spring 2012

Meeting Time/ Location: MWF, 9:05-9:55, 203 Willard Bldg.

Instructor: Dr. Ali M. Memari
213 Engineering A Bldg.
Phone: 865-3367, E-mail: memari@engr.psu.edu

Office Hours: MW 10:10-11:00 or by Appointment

Prerequisites: AE 402 or Equivalent

Objectives/Scope: The objective of this course is to present methods for design of masonry buildings, primarily concentrating on masonry wall systems. The course is delivered in a structural engineering approach with emphasis on designing masonry wall systems according to the masonry design code, referred to as Masonry Standards Joint Committee (MSJC). The course is presented primarily in a problem solution format by considering most commonly used types of masonry walls and illustrating sample calculations for analysis and design. Unreinforced and reinforced masonry design topics are treated in the course with solutions developed according to both the Allowable Stress Design (ASD) and the Strength Design (SD) Methods. Examples will include design for gravity load (axial), wind load (out-of-plane), and seismic load (in-plane). Furthermore, examples of complete masonry building design will be discussed. Recently developed simplified design guidelines will also be discussed toward the end of the course.
Lecture Topics: There will be three 50-minute lectures per week. A tentative outline of the topics is listed below:

1. Introduction to masonry structures and materials
2. Introduction to masonry design code
3. Prescriptive design of masonry wall systems
4. Design of unreinforced masonry walls (ASD, SD)
5. Design of reinforced masonry walls (ASD, SD)
6. Lateral load analysis & design of masonry shear walls
7. Design of Misc. masonry element and wall systems (e.g., pilasters, beams, cavity wall systems)
8. Seismic design provisions
9. Detailing of masonry buildings
10. Serviceability considerations in masonry buildings
11. Simplified method of masonry design

Grading:

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<th>Component</th>
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<tbody>
<tr>
<td>Homework</td>
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<td>Exam 1</td>
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Evening Exam Schedule:

- Exam I: 2/23/12, 8:15-10:15 p.m. Room: TBD
- Exam I: 4/05/12, 8:15-10:15 p.m. Room: TBD