CES 5835 – DESIGN OF MASONRY STRUCTURES – SPRING 2013

1. **Catalog Description:**
   Properties, specifications, and construction requirements for structures incorporating clay brick, concrete block, and mortar; analysis and design of masonry structures including a comprehensive diaphragm/shearwall masonry structure design project. 3 credit hours

2. **Pre-requisites and Co-requisites:** CES 3102, CES 4702, or consent of instructor

3. **Course Objectives:**
   The primary objective of this course is to familiarize the student with the complete design of a masonry structure. This includes not only the study of masonry as a building material but the design of an actual structure for all code prescribed loads including wind and seismic. The course includes a design project divided into two phases. The first project is concerned with the "non-psi" design, while the second project deals with the structural considerations.

4. **Contribution of course to meeting the professional component** (For undergraduates taking the course, it is not an ABET required course but it is a technical elective):  
   The professional goal of this course is to teach the student how to perform a complete design of an entire masonry building system including architectural engineering and structural engineering design. Secondary professional goals are to teach the student how to determine lateral loads on structures and how to analyze diaphragm/shearwall structures.

5. **Relationship of course to program outcomes** (Note: This is not an ABET required course but is a technical elective):  
   Upon successful completion of the course, the student will know how to perform a complete structural design of a masonry structure. The student will understand masonry as a system made with many material, ASD and LRFD masonry design standards, design loads including lateral loads, and analysis/design of diaphragm/shearwall structures.

6. **Instructor: Dr. Ronald A. Cook, P.E.**
   a. Office location: 475H Weil Hall  
   b. Telephone: 352-392-9537 x1507  
   c. E-mail: rcook@ce.ufl.edu  
   d. Class Web site: http://www.ce.ufl.edu/~rac/courses/CES%205835/  
   e. Office hours: W 4th and 5th, R 6th, other times are generally OK

7. **Teaching Assistant: None**

8. **Meeting Times:** Tuesday and Thursday 1:55-3:50 (TR 7-8)

9. **Class/laboratory schedule:** Lectures Tuesday and Thursday 1:55-3:50

10. **Meeting Location:** 234 Weil Hall
11. Material and Supply Fees: None

12. Textbooks and Software Required:
   b. American Society of Testing and Materials (ASTM) Masonry Specifications:
      1. Go to http://www.astm.org/campusstandards.html
      2. Current Student Members login or Join ASTM as a new Student Member (free).
      3. Insert this course code to order ASTM standards: 10361
      4. Checkout and pay $10 (Credit Card payment required).
      5. After submitting your order, you will receive an email with details on
         how to login and access the purchased standards package (there are 10
         standards).
   c. Building Code Requirements for Masonry Structures (ACI 530-08/ASCE 5-08/TMS 402-08) and Specification for Masonry Structures (ACI 530.1-08/ASCE 6-08/TMS 602-08), American Concrete Institute, Detroit, 2008 (will be ordered in class for ~$55 or
      order individually for $110 plus shipping).
   e. Class notes are available for download: http://www.ce.ufl.edu/~rac/courses/CES%205835/

13. Recommended Reading:
   - Minimum Design Loads for Buildings and Other Structures (ASCE 7-10), American Society of Civil Engineers, New York, 2010

14. Course Outline:
   a. Overview – History of Masonry Construction
   b. Properties and Testing of Masonry Units, Mortar and Grout, and Masonry Systems
   c. Cracks and Crack Control
   d. Construction Procedures and Details
   e. Design Codes and Design Loads
   f. ASD and LRFD
   g. Design of Curtain Walls - Unreinforced and Reinforced
   h. Design of Interior Bearing Walls - Unreinforced and Reinforced
   i. Design of Exterior Bearing Walls - Unreinforced and Reinforced
   j. Design of Columns, Piers, and Pilasters
   k. Diaphragm/Shearwall Analysis and Design

15. Attendance and Expectations:
    Class attendance will not be taken but you are strongly urged to attend all sessions. The information provided in the lectures is based on several years in engineering practice.
16. Grading:

Homework          20%
Test #1            20%
Test #2            20%
Project #1         20%
Project #2         20%

17. Grading Scale (could be adjusted downward but not up):

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93+</td>
</tr>
<tr>
<td>A-</td>
<td>91-92</td>
</tr>
<tr>
<td>B+</td>
<td>89-90</td>
</tr>
<tr>
<td>B</td>
<td>83-88</td>
</tr>
<tr>
<td>B-</td>
<td>81-82</td>
</tr>
<tr>
<td>C+</td>
<td>79-80</td>
</tr>
<tr>
<td>C</td>
<td>73-78</td>
</tr>
<tr>
<td>C-</td>
<td>71-72</td>
</tr>
<tr>
<td>D+</td>
<td>69-70</td>
</tr>
<tr>
<td>D</td>
<td>63-68</td>
</tr>
<tr>
<td>D-</td>
<td>61-62</td>
</tr>
<tr>
<td>E</td>
<td>&lt;61</td>
</tr>
</tbody>
</table>

“Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

18. Make-up Exam Policy: Make-up exams in case of documented family or health emergency only.

19. Honesty Policy: All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

20. Accommodation for Students with Disabilities: Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services: Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.
22. **Software Use:** All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.