1. **Department, number, and title of course**

   Department of Civil Engineering, CENG 5322, Structural Masonry Design

2. **Graduate Course**

3. **Course (catalog) description**

   Introduction to the design of structural elements for masonry buildings including lintels, walls, shear walls, columns, pilasters, and retaining walls; design of reinforced elements of concrete or clay masonry by allowable stress and strength design methods; introduction to construction techniques, materials and terminology used in masonry. Co-listed with CENG 4322. The graduate student will complete an additional project.

4. **Prerequisite(s)**

   MENG 3306, Mechanics of Materials, CENG 3325 Structural Analysis

5. **Textbook(s) and/or other required material**


   ASCE 7-05 Minimum Design Loads for Buildings and Other Structures


6. **Course Objectives**

   - Determine the design loads on a structure, determine load effects on structural components, and determine the load path through the structure.
   - Describe the properties and behavior of structural masonry.
   - Design a structure using masonry.

7. **Topics Covered**

   - Functional requirements
   - Material characteristics and behavior
   - Advantages/disadvantages of masonry as a structural material
   - Load and load path analysis for 3D structures
   - Load bearing walls
   - Shear walls
   - Lintels
   - Pilasters
   - Bond beams
   - Masonry/wood connections

8. **Class/laboratory schedule, i.e., number of sessions each week and duration of each session**

   LESSONS: 45 @ 50 min (3.0 Att/wk)  
   LABS: None

9. **Contribution of course to meeting the professional component**
3.0 Credit Hours (ES=0.5, ED=2.5)

The course reviews quickly and builds upon the structural analysis and design skills developed through CENG 3325, Structural Analysis, and MENG 3306, Mechanics of Materials. The student will become familiar with the material and how best to use it to design a structure. A design project is the mechanism used to drive the need to learn each topic in the course.

10. **Relationship of course to program outcomes**

The course director’s assessment of how this course contributes to the civil engineering program outcomes is listed below. The following scale is used:

1=No Contribution; 2=Small Contribution; 3=Average Contribution; 4=Large Contribution; 5=Very Large Contribution

<table>
<thead>
<tr>
<th>CIVIL ENGINEERING PROGRAM OUTCOMES</th>
<th>Course Director Assessment</th>
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</thead>
<tbody>
<tr>
<td>Students who qualify for graduation with a civil engineering masters will demonstrate:</td>
<td></td>
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<tr>
<td>Have developed specialized knowledge in civil engineering beyond that normally expected of undergraduates preparing them for advanced professional practice.</td>
<td>4</td>
</tr>
<tr>
<td>When conducting graduate research, have generated new knowledge and engineering methods to serve the State, the Nation, and the global community.</td>
<td>1</td>
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</tbody>
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11. **Person(s) who prepared this description and date of preparation**

Dr. Ronald W. Welch, PE, Professor, 18 October 2007.