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

   Department of Civil Engineering, CENG 5313 Prestressed Concrete

2. **Graduate Course**

3. **Course (catalog) description**

   Introduction to prestressed concrete; advanced concepts in analysis and design of prestressed beams, columns and slabs.

4. **Prerequisite(s)**

   Prerequisite: CENG 4311 Reinforced Concrete

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

   Design of Prestressed Concrete, A. Nilson, Wiley.

6. **Course Objectives**

   a. Discuss prestress loss mechanisms
   b. Analyze prestressed beams for service load stresses and strength
   c. Design prestressed concrete beams
   d. Discuss bond and anchorage problems in prestressing
   e. Calculate short and long term beam deflections
   f. Analyze and design prestressed concrete slabs
   g. Analyze and design prestressed concrete beam-columns

7. **Topics Covered**

   - Prestressing concepts, systems and materials
   - Prestress force loss mechanisms
   - Flexural analysis and design of prestressed elements
   - Shear and torsional strength design
   - Short and long term deflections
   - Strength design of axially loaded prestressed members

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

   LESSONS: 30 @ 75 min (2.0 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 provides a detailed overview of prestressed concrete element design.

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>Program Outcomes</th>
<th>Course Director Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students who qualify for graduation with a civil engineering masters will demonstrate:</td>
<td></td>
</tr>
<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>
</tr>
</tbody>
</table>

11. **Person(s) who prepared this description and date of preparation**
    Dr. Michael McGinnis, EIT, Assistant Professor, October 20, 2007.