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

Department of Civil Engineering, CENG 5316, Advanced Steel Design

2. **Graduate Course**

3. **Course (catalog) description**

Advanced design of structural steel buildings emphasizing the relationship between design and response of the structural system; theoretical basis of building codes provisions; limit state and plastic design; beam-columns; built up sections, and composite sections; and connections.

4. **Prerequisite(s)**

CENG 4317 Structural Steel Design

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.
- Use the LRFD Design methodology.
- Analyze and design built up sections.
- Analyze and design connections: direct shear, eccentric shear, direct tension, combined tension and shear.
- Analyze and design beam columns.
- Model and analyze a statically indeterminate steel frames.
- Analyze and design moment connections.

7. **Topics Covered**

- Built up sections
- Connection design: tension, direct shear, eccentric shear, combined tension and shear, moment
- Beam-column member design
- Indeterminate frames

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 design skills developed through CENG 4317, Structural Steel Design. The student will become familiar with investigate connections, built-up sections, and beam columns. 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>
</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>5</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. Ronald W. Welch, PE, Professor, 18 October 2007.