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

   Department of Civil Engineering, CENG 5199/5299/5399 Independent Study

2. **Required Course**

3. **Course (catalog) description**

   Independent study in a specific area of Civil Engineering not covered by organized graduate courses. A maximum of 3 credit hours may be applied toward a graduate degree.

4. **Prerequisite(s)**

   Consent of chair of department

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

   None

6. **Course Objectives**

   The primary purpose of the CENG 5399 elective is to provide the student with an opportunity to conduct individual or small group research into an engineering problem while accomplishing the following objectives:

   a. Apply the engineering thought process to develop creative solutions for open-ended engineering problems.
   b. Produce a publishable design/analysis/laboratory report.
   c. Present a high-quality oral presentation and paper.
   d. Prepare for life-long intellectual growth, through self-directed learning.

7. **Topics Covered**

   Project dependent

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

   LESSONS: Topic dependent   LABS: Topic dependent

   Note: Instructor contact time may be more or less than for a more structured course, but the workload (because the course focused on independent learning) is still structured to be commensurate with the number of credits (i.e. 5199 for 1 credit, 5299 for 2 credits and 5399 for 3 credits) earned.

9. **Contribution of course to meeting the professional component**

   3.0 Credit Hours (ES= See Note, ED= See Note)

   Note: Depending on the specific content, engineering design versus science credit is variable. Civil Engineers are required to be creative, life-long learners who understand contemporary issues and how they influence civil engineering projects. An independent study course will require the CE students to tackle a real problem, teach themselves skills beyond what has been covered in the curriculum while studying and considering the current contemporary issues influencing possible solutions.
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 specialized knowledge in an area of civil engineering beyond that normally expected at the undergraduate level.</td>
<td>5</td>
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<tr>
<td>Are adequately prepared for advanced professional practice.</td>
<td>3</td>
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<tr>
<td>Completing a thesis or design project address a civil engineering problem using sound engineering principles and techniques.</td>
<td>5</td>
</tr>
<tr>
<td>Solve an engineering problem of importance to the State, the Nation, or the Global community.</td>
<td>3</td>
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<tr>
<td>Demonstrate the ability for independent life-long learning.</td>
<td>5</td>
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<tr>
<td>Have effective oral, written, and graphical communication skills.</td>
<td>4</td>
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11. **Person(s) who prepared this description and date of preparation**

Dr. Ronald W. Welch, PE (VA), Professor, 20 October 2008.