## Civil Engineering Degree
### Outcomes Matrix

<table>
<thead>
<tr>
<th>Program:</th>
<th>Civil Engineering</th>
<th>Date:</th>
<th>3/6/02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title:</td>
<td>Solid Mechanics</td>
<td>Required/Elective:</td>
<td>Req’d</td>
</tr>
<tr>
<td>Course Number:</td>
<td>CIEG 212</td>
<td>Instructor:</td>
<td>Shenton</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Outcome</th>
<th>Corresponding Course Element</th>
<th>Level of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to apply knowledge of mathematics and science to engineering.</td>
<td>Use algebra, calculus and vector analysis in the solution of solid mechanics problems.</td>
<td>I</td>
</tr>
<tr>
<td>2. Ability to identify, formulate, and solve engineering problems in the following major civil engineering disciplines: structural, environmental and water resources, transportation, and geotechnical engineering.</td>
<td>Formulate and solve problems in solid mechanics: axial, flexure, shear, torsion and combined loadings; determinate and indeterminate systems; mechanical properties of materials</td>
<td>II</td>
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<tr>
<td>3. Ability to design and conduct laboratory experiments and to critically analyze and interpret data in more than one of the recognized major civil engineering disciplines.</td>
<td>No experimental component to the course (separate lab course – CIEG 213).</td>
<td>III</td>
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<tr>
<td>4. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.</td>
<td>Use computer programs such as Maple and Matlab to solve engineering problems. Use graphics and plotting programs to display data and results.</td>
<td>IV</td>
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<tr>
<td>5. Understanding of the function of civil infrastructure systems, and ability to design their components and processes to meet the desired needs of society.</td>
<td>Design simple structures (rod, beam, shaft) to satisfy specified stress and deflection criteria.</td>
<td>V</td>
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<tr>
<td>6. Ability to perform civil engineering design by means of problem-based experiences integrated throughout the curriculum.</td>
<td>Design simple structures (rod, beam, shaft) to satisfy specified stress and deflection criteria.</td>
<td>I</td>
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<tr>
<td>7. Knowledge of professional practice issues, such as procurement of work, bidding versus quality-based selection processes, and the interactions of design and construction professionals in executing a project.</td>
<td>Engineering science course – no specific professional practice content.</td>
<td>II</td>
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<tr>
<td>8. Understanding of professional and ethical responsibility.</td>
<td>Engineering science course – no specific professional ethics content.</td>
<td>III</td>
</tr>
<tr>
<td>9. Broad education and knowledge of contemporary issues necessary to understand the impact of engineering solutions in a global and societal context.</td>
<td>Engineering science course – no specific contemporary issues content.</td>
<td>IV</td>
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<tr>
<td>11. Ability to function on multi-disciplinary teams.</td>
<td>Two group projects, students work in groups of 4 or 5 to solve complex, real-world problems.</td>
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<td>12. Ability to communicate effectively.</td>
<td>Groups are required to prepare “engineering” technical reports for their group projects, two reports total in 2002.</td>
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