<table>
<thead>
<tr>
<th>Learning Outcome</th>
<th>Competency Category</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>Definitions &amp; Terminology - Engineering Design, UDesign, Glossary</td>
<td></td>
</tr>
<tr>
<td>Static</td>
<td>Principal Stresses, Von Mises Stress, Failure theories: Strength, Fracture Mechanics, Intro to Finite Element Analysis</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>S-N (Stress-Life) Diagram, Endurance Limit, Modified Goodman Failure Theory, da/dN Crack Growth</td>
<td></td>
</tr>
<tr>
<td>Shafts</td>
<td>Shaft Design</td>
<td></td>
</tr>
<tr>
<td>Bearings</td>
<td>Rolling Element Selection</td>
<td></td>
</tr>
<tr>
<td>Spur gears</td>
<td>Spur Gear Selection</td>
<td></td>
</tr>
<tr>
<td>Springs</td>
<td>Compression Spring Design</td>
<td></td>
</tr>
<tr>
<td>Fastening</td>
<td>Bolted, Bonded, Welds</td>
<td></td>
</tr>
</tbody>
</table>

**Learning Levels**

- **K** = Knowledge (can recall, repeat)
- **C** = Comprehension (can describe, explain)
- **Ap** = Application (can recognize, apply)
- **An** = Analysis (can analyze, explain why)
- **S** = Synthesis (can design, formulate)