# University of Toledo
## Mechanical Engineering Technology
### Master Syllabus

<table>
<thead>
<tr>
<th>Course Title:</th>
<th>Mechanical Design I</th>
<th>Course Code &amp; Number:</th>
<th>MET 3200</th>
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</thead>
<tbody>
<tr>
<td>Credit Hour Total:</td>
<td>3</td>
<td>Lecture Contact Hours:</td>
<td>3</td>
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<td></td>
<td></td>
<td>Lab Contact Hours:</td>
<td>0</td>
</tr>
<tr>
<td>Prerequisite(s):</td>
<td>MET 3400, MET 2120</td>
<td></td>
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<tr>
<td>Software:</td>
<td>None</td>
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### Course Description:
(Approved Catalog Description)
Introduction to the engineering design process. Analysis of stress, strain, deflection and fatigue in mechanical design. Design of beams, columns, springs and machine elements.

### Related Program Outcomes:
- **Outcome a.** Students demonstrate the ability to select and apply their knowledge and techniques of the mechanical design field.
- **Outcome d.** Students demonstrate the ability to design and improve machine elements and system components.
- **Outcome f.** The students demonstrate the ability to identify, analyze, and solve ET problems specific to mechanical design.

### Course Objectives:
Upon completion of this course the students are expected to:
1. Study the concepts of stress and apply them to mechanical elements and systems.
2. Study the design of machine elements to avoid fatigue failure
3. Study the design of machine elements to avoid failure due to stress concentrations
4. Study the relationship between mating machine elements

### Course Outline:
- The nature of mechanical design
- Stress and deformation analysis

MET 3200 – Mechanical Design I
- Combined stresses and Mohr’s circle
- Design for different types of loading
- Design and analysis of columns
- Belt drives and chains drives
- Kinematics of gears
- Spur gear design
- Helical, bevel, and worm gear design
- Design of gear trains