

# University of Toledo

## Mechanical Engineering Technology

### Master Syllabus

---

**Course Title:** *Mechanical Design I*      **Course Code & Number:** *MET 3200*

**Credit Hour Total:** 3

**Lecture Contact Hours:** 3      **Lab Contact Hours:** 0

**Prerequisite(s):** *MET 3400, MET 2120*

**Text:** *Machine Elements in Mechanical Design, 5th Edition, R.L. Mott, 2014*

**Software:** *None*

---

**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



**COLLEGE OF ENGINEERING**  
THE UNIVERSITY OF TOLEDO

- 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