

University of Toledo

Mechanical Engineering Technology

Master Syllabus

Course Title: *Metal Machining and Processes* **Course Code & Number:** *MET 1110*

Credit Hour Total: 3

Lecture Contact Hours: 3 **Lab Contact Hours:** N/A

Prerequisite(s): *None*

Text: *Technology of Machine Tools, Krar, 7th Edition, 2010*

Software: *none*

Course Description: (Approved Catalog Description)

Material and machining processes dealing with production methods, machining capabilities, and tolerances. Metal working with lathe, mill, etc., along with processes such as molding, stamping, forging, etc.

Related Program Outcomes:

Outcome a: An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines.

Course Objectives:

At the end of the course the student should be prepared to:

1. Discuss the properties of metals with emphasis on steel.
2. Use various types of measuring devices.
3. Identify and use various hand tools.
4. Discuss drilling machines and related tools.
5. Discuss lathes and related tools.
6. Discuss milling machines and related tools.
7. Discuss to a lesser degree shapers, planers, broaching machines, bench and surface grinders.
8. Discuss basic aspects of quality control and quality testing.
9. Discuss plastic materials and processes including extrusion, injection molding, blow molding, rotational molding, and forming.

10. Discuss forming and forging of metals.
11. Discuss the various metal casting processes and the forms and patterns used to make the molds.
12. Discuss the basics of powder metallurgy.

Course Outline:

- Lean Manufacturing
- History of Manufacturing
- Shop Safety
- Metal Characteristics
- Heat Treatment
- Planning & Measuring
- Hand Tools
- Threads & Fasteners
- Drilling & Drilling Tools
- Lathe, Lathe Tools, Lathe Operations
- Grinding & Sawing
- Milling Machines, Milling Operations, & Milling Tools
- Shaping, Broaching, & Grinding
- Automated Machining
- Numerical Control
- Quality Control
- Introduction to Plastic Materials
- Plastic Extrusion
- Injection Molding
- Blow Molding, Thermoforming, Rotational Molding, Compression Molding, Transfer Molding
- Sheet Metal Forming, Forging, Presswork
- Casting Processes
- Powder Metallurgy