



**Course Syllabus**

**Course #:** MET 1230 **Course Name:** Advanced Machining Processes

**Course #:** MET 1240 **Course Name:** Advanced Machining Processes Lab

**Division: Engineering and Industrial Technologies**

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**Class Days:**

**Class Time:**

**Location:** Classroom:

Laboratory:

**Credit Hours: MET1230 3**

**MET 1240 2 Contact Hours: Lab Hours: Lecture Hours:**

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**Instructor:** \_\_\_\_\_

**Office Location:**

**Phone:** \_\_\_\_\_

**Email Address:** \_\_\_\_\_

**Office Hours: TBD**

**Division Office/Location: Engineering Building Division Fax: 419-334-2300**

**Full-time Contact Person: Jayne Bowersox Phone(s): (419) 559-2410**

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**Course Description:** A continuation of MET 1130 which includes further study of turning, milling, and grinding. Also included are studies of cutting fluids, carbide tools, EDM, and properties and testing of metals. Laboratory projects designed to apply and reinforce topics covered in MET 1230.

**Prerequisite(s):** MET 1130 & MET 1140

**Corequisite(s):** MTH 1150

**Entry Level Skills and Knowledge:**

1. To develop advanced proficiency in machine tool setup and operation.
2. To develop additional techniques in precision measurement and layout.
3. To develop additional skills in applied shop mathematics including Angular measurement, indexing and rotary tables.
4. To develop an elementary understanding of cutting fluids, carbide cutting tools, ID/OD Grinding, EDM, and Engineering materials

**Required Texts, Supplies and Equipment:**

Text:

Machine Tool Practices by: Kibbe, Neely, Meyer, White; 8<sup>th</sup> Edition/Prentice Hall, 2006  
Student's Shop Reference Handbook by: Hoffman; 2nd edition/Industrial Press, 2000.

Safety glasses, Pad Lock, Writing Materials, 6” scale, tool kit w/6” Dial Calipers, and scientific calculator

**Grading:**

Final grade is based on satisfactory completion of all assignments in both classroom and Machine tool laboratory.

Laboratory work will consist of (3) shop projects and (3) related lab reports. Additional lab work will cover hardness testing, angular measurement, indexing, machine alignment, broaching, heat treatment, EDM, Acme threads, O.D. grinding and spur gears.

Grading scale is as follows:

90% – 100% =	A
80% – 89% =	B
70% – 79% =	C
60% – 69% =	D
Below 60% =	F

**Learning Outcomes:**

Upon completion of the course, the student should be able to:

1. set-up and operate a both vertical and Horizontal milling machines
2. set-up and operate an engine lathe
3. set-up and operate a sensitive drill press
4. set-up and operate a horizontal band-saw
5. set-up and operate a surface grinder and O.D. cylindrical grinder
6. perform measuring and inspection operation with precision tools including a sine bar
7. set-up and operate an EDM machine
8. set-up and cut Acme threads
9. understand and operate Rockwell and Brinell hardness testers
10. set-up and operate a dividing head and a rotary table.
11. set-up, calculate, and cut spur gears
12. calculate and determine speeds and feeds.
13. understand and perform broaching and basic heat treatment

**General Education**

1. **Communicate effectively**
2. **Evaluate arguments in a logical fashion**—Competence in analysis and logical argument are explicit learning goals for most general education programs, although these skills go by a variety of names (e.g., critical thinking, analysis, logical thinking, etc.). **Students will be able to demonstrate competence in problem solving in communication, mathematics, and in team settings.**
3. **Employ the methods of inquiry characteristic of natural sciences, social sciences, mathematics, and the arts and humanities;** general education introduces students to methods of inquiry in several fields of study and thereby prepares students to integrate information from different disciplines.

**Assessment of Student Learning:**

Assessment Project and Measurement in course (if any):

## Plan of Work:

### WEEK

- 1 Turning between centers, pages (468-478)  
Mandrels, pages (478-480)  
Aligning centers, pages (481-483)
- 2 Cutting tapers, pages (522-532), (189-198)  
Steady rest and follow rest, pages 533-538
- 3 Woodruff keys, pages 27, 42-45 (260-263) **Quiz 1**
- 4 Boring and internal threading, pages (457-461), (487-490)
- 5 Materials, pages (207-249), (433-481), (482-489)  
First lab project and report due
- 6 Horizontal milling, pages (585-602)  
Milling setups, plain milling, side milling, & face milling, pages (603-627)  
**Quiz 2**
- 7 Material, pages 207-249  
Second lab project and report due
- 8 EDM - Demo, page (779-781)  
Cutting tool materials, Carbides and coatings, pages (306-371), (603 - 627)
- 9 Machinability, pages 285-300  
Third lab project and report due  
**Quiz 3**
- 10 ID/OD grinding, pages (631-639), (685-711)  
Cutting fluids, pages (301-305), (660-664)
- 11 Gears and Gear Cutting
- 12 Sine Bar and Angular measurement, pgs. (179 – 197), (532)  
**Quiz 4**
13. Indexing heads and rotary tables, pages (605 – 607)
14. Acme threads, pages (539 – 541)
15. Hardness testing, pages (241 – 250)  
**Quiz 5**

**Course Requirements:**

Complete all assignments as required

**Policies**

**Course Withdrawing:** If for any reason you need to withdraw from this course, be certain that you do so according to College procedure. It is your responsibility to know and follow this procedure. If you simply stop coming to class, without officially withdrawing from the course, your grade is an automatic “F.” Please follow official College procedure for withdrawing from this or any course.

*College Academic Policies are located in the College Catalog. A copy of the current catalog may be picked up in any of the division offices or admissions. The list of college policies is also available online at <https://www.terra.edu/register/Collegecat/policies.asp>.*

**Support Services:** The College offers a number of support services to assist in your success in this course and all courses. Among these services are the Writing & Math Center in B105, the Office of Learning Support Services, which coordinates the campus disability services and tutoring programs, the computer labs, and the computers in the atriums.

Any student who feels he/she may need an accommodation based on the documentation of a disability should contact the Office of Learning Support Services privately to discuss his/her specific issues. Please contact the OLSS at (419) 334-8400 X 208 or visit 100 Roy Klay Hall (Building A) to coordinate reasonable accommodations.

***If you have a documented disability and are receiving academic accommodations through the Office of Learning Support Services, please schedule a meeting with your instructor in a timely manner so that we may discuss how these services will be arranged.***

Tutoring services are available to students beginning the second week of every quarter. Students requesting tutoring services should obtain a tutor request form from the OLSS in 100 Roy Klay Hall (Building A) or online at the Terra website. Please note that instructor verification and acceptance of the Student Learner Agreement is necessary for all tutoring requests. All requests should be submitted to 100 Roy Klay Hall (Building A).