



Course Syllabus

Course #: MET 1130 Course Name: Introduction to Machining Processes

Division: Engineering and Industrial Technologies

Class Days: Class Time:
Location: Classroom: Laboratory:
Credit Hours: Contact Hours: Lab Hours: Lecture Hours:

Instructor: Ed Eberle Office Location: E 215 P
Phone: 419-559-2458 Email Address: eeberle@terra.edu

Office Hours: TBD

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

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

Course Description:

An introduction to precision tools and measurement, basic machine tools, and machine tool operations. Emphasis is on current industrial methods and practices, including consideration for ecology, profitability, and safety.

Prerequisite(s): None

Corequisite(s): None

Entry Level Skills and Knowledge:

Development of basic proficiency in machine tool setup and operation.
To develop techniques in precision measurements, layout, and inspection.
Develop skills in applied mathematics related to manufacturing processes.
To develop an elementary understanding in planning manufacturing operations.

Required Texts, Supplies and Equipment:

TEXT: Machine Tool Practices by Kibbe, Neely, Meyer & White; 8th edition
Prentice Hall, 2006 and Students Shop Reference Handbook by
Hoffman; 1st edition, Industrial Press, 2001

- Safety glasses
Writing materials
Padlock
Scientific Calculator
Tool Kit contains the following:
Caliper
Micrometer
6" Steel Scale
5/16" HSS Tool Bit
Center gage

Grading:

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

Grading scale is as follows:

90% - 100 =	A
80% - 89 =	B
70% - 79 =	C
60% - 69 =	D
0 - 59 =	F

Learning Outcomes:

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.

General Education

- Development of basic proficiency in machine tool setup and operation.
- To develop techniques in precision measurements, layout, and inspection.
- To develop skills in applied mathematics related to manufacturing processes.
- To develop an elementary understanding in planning manufacturing operations.

Assessment of Student Learning:

Assessment Project and Measurement in course (if any):

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

1. Set-up and operate a vertical milling machine.
2. Set-up and operate an engine lathe.
3. Set-up and operate a sensitive drill press.
4. Set-up and operate a vertical or horizontal band saw.
5. Set-up and operate a surface grinder.
6. Perform precision measuring and inspection procedures with precision tools.
7. Plan and perform basic manufacturing operations in proper sequence.
8. Demonstrate proficiency in shop mathematics to perform all of the above.

Topical Outline:

- I. Introduction and Orientation
 - A. Course Description
 - B. Course Objectives
 - C. Grading Procedures
 - D. Required Materials
 - E. Course Outline
 - F. Safety and Housekeeping
 - G. Student Information Forms
 - H. Miscellaneous Information
 - I. Text--Preface
 - J. Introduction, pages 1 - 5
 - K. Shop Safety, pages 6 - 13
 - L. Mechanical Hardware, pages 14 - 27
 - M. Reading Drawings, pages 28 - 36

- II. Measurement, Layout, Gaging, and Inspection
 - A. Standards of Measurement
 - B. Measuring Instruments
 - C. Layout Instruments and Methods
 - D. Inspection and Testing
 - E. Text--Section C, Dimensional Measurement, pages 94 - 206, Section E, Layout, Pages 252 - 283

- III. Machine Tool Operations
 - A. Metal-Cutting Principles
 - 1. Cutting Tool Geometry
 - 2. Cutting Tool Materials
 - 3. Speeds and Feeds
 - 4. Text--Section F, Preparation for Machining Operations, pages 286 - 322
 - B. Turning, Boring, and Thread Cutting
 - 1. Engine Lathe Design and Nomenclature
 - 2. Setups and Operations
 - 3. Accessories and Equipment
 - 4. Turret Lathes
 - 5. Screw Machines
 - 6. Text--Section I, Turning Machines, pages 414 - 547

- III. Machine Tool Operations (Continued)
 - C. Milling
 - 1. Machine Types and Sizes
 - 2. Milling Cutters and Accessories
 - 3. Setups and Operations
 - 4. Text--Section J, Vertical Milling Machines, pages 550 - 583
Section K, Horizontal spindle milling machines, pages 586 -628

 - D. Drilling and Reaming
 - 1. Machine Types and Sizes
 - 2. Drilling Tools and Operations
 - 3. Reaming Tools and Operations
 - 4. Text--Section H, Drilling Machines, pages 370 - 412

 - E. Abrasive Machining Operations
 - 1. Abrasive and Grinding Wheels
 - 2. Grinding Machine Types

3. Setups and Operations
4. Honing and Lapping
5. Text--Section L, Grinding & Abrasive Machining Processes, pages 630 - 712

IV. Planning Manufacturing Operations

- A. Quantity, Process, and Design Relationships
- B. Part Analysis
- C. Routing Operations
- D. Planning, Automation, and Organization

Plan of Work:

- Week 1
- Week 2
- Week 3
- Week 4
- Week 5
- Week 6
- Week 7
- Week 8
- Week 9
- Week 10
- Week 11
- Week 12
- Week 13
- Week 14
- Week 15

Course Requirements:

Complete all assignments as required

Classroom work will consist of lectures, discussions, homework assignments, and tests to evaluate your understanding of both the class material and laboratory work. Five (5) graded assignments (quizzes) will be given and will be averaged to determine a class participation grade.

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).

Plan of Work:

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8