



Course Syllabus

Course #: MET 1780 Course Name: Tool & Die Making
Division: Engineering and Industrial Technologies

Class Days: Class Time:
Location: Classroom: Laboratory:
Credit Hours: 4 Contact Hours: Lab Hours: 2 Lecture Hours: 4

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

Course Description:

This course examines tool design methods from the problem statement through methods from the problem statement through analysis and research to tentative finish design solutions. Ferrous and non-ferrous metals and the theory of heat treatment will be examined. An in-depth study of gage designs including fixed, indicating, and automatic will be presented. The design of drill jigs and the construction of fixtures for vise, lathe, milling, and grinding will be discussed. Primarily for apprenticeship programs.

Prerequisite(s): MET 1230 and MET 1240

Corequisite(s): None

Entry Level Skills and Knowledge:

Required Texts, Supplies and Equipment:

Tool Design, 3rd ed.
By Donaldson; Glencoe, McGraw-Hill Publishers 1999

- 1/4" Square graph paper
Safety glasses
Calculator
Writing material

Grading: 90 - 100 % = A
80 - 89 % = B
70 - 79 % = C
60 - 69 % = D
Below 60% = 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.

Technical Education

1. Develop proficiency in tool design procedures, methods, and logical problem solving.
2. Development of proper tool making practices
3. Understand various metals and tool steels, their application and use, and heat treatment practices.
4. Develop understanding and skills in gage design, jig and fixtures design, and their construction methods.
5. Proficiency in design and operation of sheet metal blanking and piercing dies, sheets metals bending, forming and deep draw dies and related components.
6. Understand tool holding and the design of tool holders, fixtures and jigs for CNC machines.
7. Demonstrate understanding of automatic screw machines from brown and sharp Swiss machines to Acme Gridley machines.
8. Demonstrate understanding of proper preventative maintenance, servicing and repairing all of the above.

Assessment of Student Learning:

Assessment Project and Measurement in course (if any)

Week

1. Principles of Blanking and/or Piercing Dies 1
2. Elementary Blanking Dies and Pierce Dies 14
3. Bending 23
4. Screw Holes and Dowel Holes 51
5. Die Life 58
6. Punches 63
7. Punches Mounted in Punch Plates 74
8. Pilots 87
9. Die-block Constructions 97
10. Strippers and Stock Guides 109
11. Shedders and Knockouts 128
12. Nest Gages 137
13. Pushers 148
14. Die Stops 153
15. Stock Material Utilization and Strip Layouts 172
16. Die Sets 191

Course Requirements:

Complete all assignments as required

Satisfactory attendance of all class and lab sessions; satisfactory completion of all chapter tests, final test, homework assignments and lab projects. Students may help one another with projects; however each student must turn in their own work and may not copy any work of other students.

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).