

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

SHOP PRACTICES
MET 1020

Class Hours: 3.0

Credit Hours: 4.0

Laboratory Hours: 3.0

Revised: Fall 06

Catalog Course Description:

Shop Practices is an introductory course in the theory, set-up, and operation of basic machine tools and measuring equipment.

Entry Level Standards:

Students entering this course must have completed basic skills in reading comprehension, written communication, and mathematics.

Corequisites:

ENGT 1000 (For MET Majors) & CID 1100

Textbook(s) and Other Course Materials:

Textbook:

Machine Tool Technology: Repp & Mc Carthy, Glencoe Publishing Company, Latest Edition.

Machinists' Ready Reference: Weingartner, Prakken, Latest Edition.

References: *Machinery's Handbook*: Oberg, Jones, & Horton, Industrial Press, Latest Edition.

Basic Shop Measurement: Hoffman, John Wiley & Sons, 1983.

I. Week/Unit/Topic Basis:

| Week | Topic |
|-------------|-----------------------------------|
| 1-3 | Measurement, Inspection, & Set-Up |
| 4-6 | Milling & Set-Up |
| 7-8 | Turning & Set-Up |
| 9 | Screw Threads |
| 10-11 | Drilling, Boring, and Reaming |
| 12 | Sawing and Shaping |
| 13-14 | Grinding and Abrasives |
| 15 | Review & Final Exam |

II. MET Program Objectives & Outcomes:

Objectives:

- I. Apply basic engineering theories and concepts.
- II. Apply basic engineering theories and concepts.
- III. Identify and solve work related problems with minimum assistance.
- IV. Operate equipment and instruments with a high degree of skill.
- V. Communicate effectively, including verbal, writing, and graphical skills.
- VI. Apply the principles of good work ethics.
- VII. Obtain gainful employment in the MET discipline or matriculate to a 4-year program in engineering technology.

Outcomes:

- A. apply the knowledge of mathematics, science, and engineering technology. (I, II, IV, VI)
- B. use the techniques and modern engineering tools needed for engineering technology practices. (I – IV, VI)
- C. identify, formulate, and solve engineering technology-based problems. (I, II, VI)
- D. design and conduct experiments, as well as analyze and interpret collected data. (I– IV, VI)
- E. create or fabricate a system, subsystem, component, or process to meet specified needs. (I – IV, VI)
- F. read and extract information from manuals, journals, and other discipline related literature. (I –IV, VI)
- G. communicate effectively, including verbal, writing, and graphical skills. (IV, V, VI)
- H. function and contribute positively in team situations. (II, IV- VI)
- I. comprehend social, professional, and ethical responsibilities, including development of a respect for diversity and other contemporary issues.(II, V, VI)
- J. realize the impact of engineering technology solutions in a global and societal context. (V, VI)
- K. realize the importance of a commitment to quality, timeliness, and continuous improvement. (V, VI)
- L. recognize the importance of life-long learning.(I – VI)

III. Course Objectives*:

- A. Demonstrate their understanding of basic inspection, measuring, and gaging concepts. (A, B)

- B. Set-up, maintain, and functionally operate a standard milling machine. (B)
- C. Set-up, maintain, and functionally operate a standard lathe. (B)
- D. Demonstrate their understanding of basic sawing, drilling, and grinding concepts. (A, B)
- E. Communicate technical information. (F, G)

*Letters after course objectives reference MET Program Outcomes (as required by ABET).

IV. Instructional Processes*:

Students will:

1. Actively listen to class lectures and participate in class activities that develop and reinforce an understanding of the theories, concepts, principles, and applications of machining processes and measuring equipment. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
2. Use concepts derived in the text and critical thinking skills to solve problems presented in the book, on class exams, and in the laboratory. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
3. Work individually to complete projects and assignments related to the theories, concepts, principles, and applications covered in the lecture or demonstration portion of the course. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
4. Collect, analyze, and tabulate data in an orderly format to prepare a college level technical report using computer software packages such as Microsoft Word, Excel, and AutoCAD. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
5. Observe in-class demonstrations on equipment, practice, and then demonstrate to instructor basic manipulative skills required to set up machine tool and part for manufacturing. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*

*Strategies and outcomes listed after instructional processes reference TBR's goals for strengthening general education knowledge and skills, connecting course work to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

V. Expectations for Student Performance*:

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

1. Identify a variety of gages and measuring instruments. A
2. Calibrate, operate, and maintain a variety of standard and electronic measuring equipment. A
3. Calculate allowance for mating parts. A
4. Calculate and set-up angles using gage blocks and a sine bar. A
5. Identify properties for a surface roughness tolerance (metric & english). A

6. Identify a variety of milling machines, attachments, and cutters. B
7. Identify factors and calculate (metric & english) feeds and speeds for a standard milling machine. B
8. Set-up, machine to tolerance, and inspect a part manufactured on a standard milling machine. A, B, & D
9. Identify a variety of lathes, attachments, and cutters. C
10. Identify factors and calculate (metric & english) feeds and speeds for a standard lathe. C
11. Identify and associate function of a variety of threads. C
12. Calculate thread depth and pitch. C
13. Set-up, machine to tolerance, and inspect a part manufactured on a standard lathe. A, C, & D
14. Associate concepts and perform basic sawing, drilling, and reaming operations. B, C, & D
15. Identify and associate the basic principles used in grinding. D
16. Document technical information in a neat and orderly format. E
17. Complete assignments based on oral instructions. E

*Letters after performance expectations reference the course objectives listed above.

VI. Evaluation:

A. Testing Procedures:

Evaluation of both classroom and laboratory work is required in this course. Total evaluation will be based on the following point distribution:

Unit Exams (50 Points)

Approximately 5-7 exams will be administered during the course. They will include discussion questions, short answer questions, true/false questions, and problem solving.

B. Laboratory Expectations:

Laboratory Projects

Project 1: Measuring (10 Points)
 Project 2: Mill/Drill (10 Points)
 Project 3: Lathe (10 Points)
 Project 4: Screw Threads (10 Points)
 Lab Report (10 Points)

Guidelines and requirements for each project will be provided by the instructor.

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

A 93-100
B+ 88-92
B 83-87
C+ 79-82
C 74-78
D 65-73
F Below 65

VII. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course (Pellissippi State Catalog).

B. Academic Dishonesty:

Refer to the Pellissippi State Catalog & Handbook.

C. Accommodations for disabilities:

If you need accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Please see the instructor privately after class or in his/her office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127 or 131 or by phone: 694-6751(Voice/TTY) or 539-7153.

D. Other Policies:

Make-Up Quizzes: As a general rule, no make-up quizzes will be administered during the course.

Safety and Equipment Abuse: Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury will result in automatic failure of the course.

Your instructor is available during posted office hours or by appointment.