

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

Class Hours: 3.0

Credit Hours: 3.0

Laboratory Hours: 0.0

Revised: Fall 06

Catalog Course Description:

An introductory course in the development and use of various testing procedures. Topics include measuring devices including use, care, and calibration, measurement uncertainty and error, developing a test plan and part layout, data collection methods and analysis, and final reporting. In addition, the topics of product reliability and ISO certification are presented.

Entry Level Standards:

Students entering this course must be capable of organizing and communicating an extensive amount of information in a written format.

Prerequisites:

ENGL 1010 and MET 1012

Textbook(s) and Other Course Materials:

Textbook: *The Quality Technician's Handbook*: Griffith, Prentice-Hall, Latest Edition, 2003.

References: *TEST OFFICERS GUIDE*: USATTC MEMO 70-7, 1 October 1983, USATTC APO Miami 34004.

Materials Testing in the Tropics: USATTC Report 790401, April 1979.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction
2-6	Measuring Devices: Direct & Indirect Measuring instrument use, care, & calibration
7-8	Measurement Uncertainty Measurement Error
9-10	Part Layout and Test Plans
11-12	Data collection methods and analysis Reporting of findings

13-14	Product Reliability ISO certification
15	Presentation/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 testing principles. (A-D, F, G)
- B. Demonstrate proper use, care, and calibration of direct measuring devices. (A, B)
- C. Demonstrate proper use, care, and calibration of indirect measuring devices. (A, B)
- D. Design a part layout and test procedure. (F, G)
- E. Conduct tests; collect and analyze data. (B-D)
- F. Prepare a test report.(A-C, F, G)
- G. Explain the concepts and principles of product reliability. (A-C, J, K)
- H. Identify and explain the main concepts regarding ISO certification. (A-C, J, K)
- I. Identify and explain measurement errors. (A-C, F, G)
- J. Explain the principles of measurement uncertainty. (A-C, 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 discussions that develop and reinforce an understanding of the theories, concepts, principles, and applications of the fundamentals of testing parts and products. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
2. Work individually or in teams 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*
3. Analyze, tabulate, and present collected data in an orderly format to prepare a college level technical report using computer software packages such as AutoCAD, Microsoft Word, Word Perfect, Excel, FeatureCAM Manufacturing Software, Coordinate Measuring software, MD Solids, Working Model 2D. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
4. Use research and oral presentation skills to present findings to a subject matter expert, peer group or an evaluation team from industry. *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. Define, explain, and associate the terminology used in testing. A
2. Select and identify objectives for a variety of tests. A
3. Identify sequence of events in development cycle. A
4. Explain and demonstrate the proper care, use, and calibration of direct measuring devices. B
5. Explain and demonstrate the proper care, use, and calibration of indirect measuring devices. C
6. Identify specifications for a part, end item, or system.
7. Select appropriate sample sizes. C
8. Develop a logical and comprehensive part layout and test plan. D
9. Analyze data and accept, reject, or retest based on preliminary findings. D, E
10. Process and organize data. E, F
11. Determine acceptability or rejectability of data and make recommendations. E
12. Document technical information in a neat and orderly format. F
13. Explain the concepts and principles of product reliability. G
14. Identify and explain the main concepts regarding ISO certification. H
15. Identify and explain measurement errors and measurement uncertainty. I, J

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

VI. Evaluation:

A. Testing Procedures:

Comprehensive Final Exam (10 Points)

B. Laboratory Expectations:

Evaluation of both classroom work and student projects is required and points will be awarded as follows:

- | | | |
|----|------------------------------|-------------|
| A. | Project 1: Gage R & R Study | (15 Points) |
| B. | Project 2: Part Layout | (20 Points) |
| C. | Project 3: Measurement Error | (25 Points) |
| D. | Project 4: Test Reporting | (25 Points) |

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

C. Field Work:

N/A

D. Other Evaluation Methods:

Participation (5 Points)

Based on instructor observation during the course, each student will be evaluated on participation activities. Evaluation parameters to include active participation in class discussions, being prepared, striving to achieve more than minimum requirements, and regular attendance.

E. Grading Scale:

Final grade for this course will be based on the following alphabetic/numerical 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). Individual departments/ programs/ disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Academic Dishonesty:

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the regular Pellissippi State procedures as a result of academic misconduct, the instructor has the authority to assign an F or a zero for the exercise or examination or to assign an F in the course.

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 Exams: As a general rule, no make-up exams 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.