

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**FUNDAMENTALS OF TESTING
MET 2800**

Lecture/Lab Hours: 3

Credit Hours: 3

Date Revised: Spring 2017

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.

Prerequisites

None

Co-requisites

None

Textbooks and Other Supplies

The Quality Technician's Handbook: Griffith, Prentice-Hall, Latest Edition

Week/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
15	Presentation/Final Exam

Engineering Technology General Outcomes (Educational objectives)

- I. Apply basic engineering theories and concepts creatively to analyze and solve technical problems.
- II. Utilize with a high degree of knowledge and skill equipment, instruments, software, and technical reference materials currently used in industry.
- III. Communicate effectively using developed writing, speaking, and graphics skills.
- IV. Assimilate and practice the concepts and principles of working in a team environment.
- V. Obtain employment within the discipline or matriculate to a four year program in engineering or industrial technology.

Engineering Technology Concentration Competencies

NOTE: At the program level all 6 competencies apply to roman numerals I – V of the Engineering Technology General Outcomes (Educational objectives) listed above.

Students will

- A. Apply the knowledge, techniques, skills, and modern tools for the concentration of study to specifically defined engineering technology activities.
- B. Demonstrate the knowledge of mathematics, science, engineering and technology to engineering technology problems using developed practical knowledge.
- C. Conduct and report the results of standard tests and measurements, and conduct, analyze and interpret experiment or project results.
- D. Function effectively as a member of a technical team.
- E. Identify, analyze and solve specifically defined engineering technology-based problems.
- F. Employ written, oral and visual communication in a technical environment.

Course Goals

NOTE: Capital letters after course goals reference goals of the Engineering Technology Program.

The course will

1. Enhance effective understanding of basic testing principles. (A,B,C,E,F)
2. Enhance effective understanding of the proper use, care, and calibration of direct measuring devices. (A,B,E)
3. Enhance effective understanding of the proper use, care, and calibration of indirect measuring devices. (A,B,E)
4. Expand student understanding of designing a part layout and test procedure. (A-F)
5. Guide students to conduct tests; collect and analyze data. (A-F)
6. Guide students to prepare a test report. (D,E,F)
7. Guide students to explain the concepts and principles of product reliability. (A,B,F)
8. Guide students to identify and explain the main concepts regarding ISO certification. (A,B,C,E,F)

9. Guide students to identify and explain measurement errors. (A,B,C,E,F)
10. Expand student understanding of the principles of measurement uncertainty. (A,B,C,E,F)

Expected Student Learning Outcomes

NOTE: Numbers after Expected Student Learning Outcomes reference the course goals listed above.

The student will

- a. Define, explain, and associate the terminology used in testing. (1)
- b. Select and identify objectives for a variety of tests. (1)
- c. Identify sequence of events in development cycle. (1)
- d. Explain and demonstrate the proper care, use, and calibration of direct measuring devices. (2)
- e. Explain and demonstrate the proper care, use, and calibration of indirect measuring devices. (3)
- f. Identify specifications for a part, end item, or system. (4)
- g. Select appropriate sample sizes. (4)
- h. Develop a logical and comprehensive part layout and test plan. (4)
- i. Analyze data and accept, reject, or retest based on preliminary findings. (4, 5)
- j. Process and organize data. (5, 6)
- k. Determine acceptability or rejectability of data and make recommendations. (5)
- l. Document technical information in a neat and orderly format. (6)
- m. Explain the concepts and principles of product reliability. (7)
- n. Identify and explain the main concepts regarding ISO certification. (8)
- o. Identify and explain measurement errors and measurement uncertainty. (9, 10)

Evaluation

Total evaluation will be based on the following point distribution.

Testing Procedures

Project 1: Gage R & R Study	15 points
Project2: Part Layout	20 points
Project 3: Measurement Error	25 points
Project 4: Test Reporting	25 points

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

Comprehensive Final Exam	10 points
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Participation	5 Points
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Based on instructor observation during the course, each student will be evaluated on participation activities. Evaluation parameters to include active participation in class discussions, response to verbal questions, quizzes and regular attendance.

Laboratory Experiences

N/A

Field Work

N/A

Other Evaluation Methods

N/A

Grading Scale

Final grade for this course will be based on the following alphabetical/numerical scale.

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

Policies

Attendance Policy

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

Academic Dishonesty

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.

- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Accommodations for Disabilities

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. [Disability Services](#) (<http://www.pstcc.edu/sswd/>) may be contacted via [Disability Services email](#) or by visiting Alexander 130.

Other Policies

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 could result in automatic failure of the course