

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

**SPECIAL PROJECTS: MECHANICAL ENGINEERING TECHNOLOGY
MET 2610**

Class Hours: 2.0

Credit Hours: 4 (2-4)*

Laboratory Hours: 6.0

Revised: Fall 06

Catalog Course Description:

A projects-based course in which the students and the instructor identify a research design problem to be pursued by the students. This course exposes the students to “real world” situations encountered in industry, and offers the students an opportunity to apply the skills, knowledge, and abilities learned in previous classes.

* NOTE: Course may be repeated for 8 hours of credit total, with a 2 hour block minimum per semester.

Entry Level Standards:

Students entering this course should have sophomore class standing in one of the following engineering technology disciplines: Mechanical Engineering Technologies (MET), Electrical Engineering Technology (EET), or Computer Integrated Drafting and Design Technology (CIDD). Any exceptions must be approved by the program coordinator.

Prerequisites:

Sophomore class standing

Textbook(s) and Other Course Materials:

Textbook: None

Handouts: Instructor Generated

Resources: Library, Internet, Subject Matter Experts, Industrial Partners

I. Week/Unit/Topic Basis:

| Week | Topic |
|-------------|---|
| 1 | Course Introduction Project Planning & Logistics |
| 2-5 | Design Criteria & Considerations |
| 6-11 | Production and Assembly |
| 12-13 | Inspection (parts & assemblies) |
| 14 | Functional Testing & Analysis |

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*:

Upon successful completion of this course, depending upon their individual area of study, the student will

be able to accomplish at least three of the following objectives:

- A. Apply basic skills and knowledge of mechanical design. (A-G)
- B. Apply basic skills and knowledge of manufacturing. (A-G)
- C. Apply basic skills and knowledge of quality control. (A-G)
- D. Apply basic skills and knowledge of electrical engineering technologies. (A-G)
- E. Apply basic skills and knowledge of computer integrated drafting. (A-G)
- F. Work in a multi-disciplinary team to create a product. (G, H)
- G. Present results and findings in a professional and formal manner. (G, H)

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

IV. Instructional Processes*:

Students will:

1. Work in a team environment to accomplish assigned tasks. *Communication Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
2. Research and review pertinent historical and current information in the fields of study as they relate to the project. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy Outcome, Active Learning Strategies*
3. Maintain contact and give progress reports to the industrial partners and vendors associated with the project. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy Outcome, Transitional Strategies, Active Learning Strategies*
4. Create, design, evaluate, and revise prototype design to determine the final product design in conjunction with the industrial partners. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy Outcome, Transitional Strategies, Active Learning Strategies*
5. Acquire materials and tooling, determine manufacturing processes, setup a production schedule, produce parts and subassemblies with associated drawings and schematics required to produce a final working product. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy Outcome, Transitional Strategies, Active Learning Strategies*
6. Develop a quality control test plan complete with documents and charts, and institute strategies for data collection associated with product inspection and reliability. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy Outcome, Transitional Strategies, Active Learning Strategies*
7. Develop and write a resource manual to include instructions for installation, operations, and periodic maintenance for the product. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy*

Outcome, Transitional Strategies, Active Learning Strategies

8. Present information and findings on the project and product formally in both written and oral formats. *Communication Outcome, Natural Sciences Outcome, Mathematics Outcome, Technological Literacy Outcome, Transitional Strategies, 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, depending upon their individual area of study, the student will be able to meet at least three of the following expectations:

1. Identify, explain, and apply mechanical design concepts to include the following areas of study: statics; strengths of materials; fluid power application; mechanical elements and systems; part print production, and work scheduling. A, F, G
2. Identify, explain, and apply manufacturing concepts, such as: process and tooling selection; material acquisition; part programming and production, work handling and scheduling. B, F, G
3. Identify, explain, develop, and apply quality control practices as they relate to the following: test plan development; destructive and nondestructive testing procedures; statistical process control (SPC); coordinate measuring techniques and programming; and data collection and analysis. C, F, G
4. Identify, explain, and apply electrical and electronic concepts to include the following areas of study: AC and DC circuits, microprocessors, and rotating machinery (e.g. motors, servo drives, and generators) D, F, and G
5. Identify, explain, and apply computer drafting and design concepts to include the following: three-view orthographic drawings, auxiliary and section views, assembly drawings, fluid power schematics, and electrical diagrams. E, F, G
6. Develop information and write technical reports and related documents, such as feasibility studies, progress reports, test plans, control charts, forms, and final inspection analysis documents. A, B, C, D, E, F, & G
7. Present findings formally as a team to an evaluation committee or peer group. A, B, C, D, E, F, & G

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

VI. Evaluation:

A. Testing Procedures:

Evaluation of work is required in this course. Total evaluation is based on the following point distribution.

B. Laboratory Expectations:

Project Production (40 Points)

Project Report (35 Points)

Project Presentation (20 Points)

Guidelines and requirements for the project will be developed by the instructor and students.

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 team discussions, being prepared, efficient use of lab time, striving to achieve more than minimum requirements, and regular attendance.

E. Grading Scale:

Final grade for this course will be based on the following alpha-numeric 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:

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:

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.