

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

**MACHINE ELEMENTS W/ LAB
MET 2030**

Class Hours: 2.0

Credit Hours: 3.0

Laboratory Hours: 3.0

**Date Revised: Spring
00**

Catalog Course Description:

A study in the selection and application of basic elements common to most machinery. Topics include drivetrains, power transmissions, couplings, friction reducers, maintenance and troubleshooting.

Entry Level Standards:

Students entering this course must have a working knowledge of statics, strength of materials, dynamics, and basic machine practices.

Prerequisites:

None

Textbook(s) and Other Reference Materials Basic to the Course:

Machine Design: Esposito, Delmar Publishers, Inc., 1991

Machine Design for Mechanical Technology: Kolstee, Holt-Rinehart-Winston, 1984.

Machine Elements in Mechanical Design: Mott, Merrill Publishing Company, 1985.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction to Mechanisms w/related topics
2	Introduction to Mechanisms w/related topics (cont.)
3	Bearings
4	Bearings (cont.)
5	Shaft Design & Associated Elements
6	Shaft Design & Associated Elements (cont.)
7	Shaft Design & Associated Elements (cont.)
8	Gearing & Cams

9	Gearing & Cams (cont.)
10	Belt & Chain Drives w/Associated Elements
11	Belt & Chain Drives w/Associated Elements (cont.)
12	Fasteners & Power Screws
13	Design Project/Final Presentation/Exam
14	Design Project/Final Presentation/Exam
15	Design Project/Final Presentation/Exam
16	Design Project/Final Presentation/Exam

II. Course Objectives*:

- A. Understand journal and rolling contact bearings. I, II, IV
- B. Understand shafts and associated elements. I, II, IV
- C. Understand power transmission. I, II, IV
- D. Understand cams. I, II, IV

*Roman numerals after course objectives reference goals of the Engineering and Media Technologies department.

III. 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 machine elements. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*
2. Work individually or in teams to complete projects, lab experiments, assignments related to the theories, concepts, principles, and applications covered in the lecture or demonstration portion of the course. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information 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, EZ-Feature Manufacturing Software, Data Myte Statistical Process Control, Ziess-Numerex Coordinate Measuring software, MD Solids, Working Model 2D. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies, Transitional Strategy*
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, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Active Learning Strategies*

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

IV. Expectations for Student Performance*:

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

1. Explain and apply the hydrodynamic theory of lubrication. A
2. Solve for life expectancy of a bearing. A
3. Select an appropriate bearing based on system analysis. A
4. Calculate critical speeds. B
5. Select shaft material, size, and shape from standard tables. B
6. Select appropriate fasteners. B
7. Analyze system and select appropriate belt and chain drives from standard catalogs. C
8. Identify basic gear geometry and types of gears. C
9. Calculate gear forces and stresses. C
10. Select appropriate gearing system which provides maximum operational efficiency. C
11. Identify and explain the function of various types of cams and followers. D
12. Design a simple cam. D

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

V. Evaluation:

A. Testing Procedures:

50 points: There will be 4-5 exams administered during the course

B. Laboratory Expectations:

40 points: Laboratory will include problem-solving sessions and a special design project. Guidelines and requirements for special project will be provided by the instructor

C. Field Work:

10 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, response to verbal questions, quizzes, and regular attendance.

D. Other Evaluation Methods:

None

E. Grading Scale:

- A 92-100
- B+ 88-91
- B 83-87
- C+ 79-82
- C 74-78
- D 65-73
- F Below 65

VI. 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:

Cheating on a quiz or assigned project will not be tolerated. First offense will result in immediate dismissal and automatic failure of the course. Assistance from other students is encouraged during the learning stages of the course, but each student is responsible for completing their own course assignments.

C. Other Policies:

Make-Up Exams: As a general rule, no make-up quizzes or 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.

Counseling: Counseling is available during posted office hours or by appointment.