



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Engineering Technology 10A
Descriptive Title: Principles of Engineering Technology I
Course Disciplines: Engineering Technology AND Manufacturing Technology
Division: Industry and Technology

Catalog Description:

This is the first of two courses in which students will explore technology systems and engineering processes to learn how math, science, and technology impact our society. The topics introduced include the design process, communication, documentation, and engineering systems.

Note: The two-course sequence Engineering Technology 10A and Engineering Technology 10B is the same as Engineering Technology 10.

Conditions of Enrollment: *You have no defined prerequisites.*

Course Length:	X Full Term	Other (Specify number of weeks):
Hours Lecture:	1.00 hours per week	TBA
Hours Laboratory:	2.00 hours per week	TBA
Course Units:	1.50	

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: X Effective Date: 12/15/2008
Transfer UC: No

General Education:

El Camino College:

CSU GE:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

SLO #1 Careers

Students will research engineering and engineering technology careers and create a report.

SLO #2 Six Simple Machines

Student will build the SMET project demonstrating the six simple machines.

SLO #3 Mousetrap Car

Student will build a mousetrap-powered car.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Compare and contrast essential components contained in a basic mechanical system.
Laboratory reports
2. Compare and contrast various forms of energy.
Laboratory reports
3. Document design ideas graphically and in writing.
Laboratory reports
4. Identify the application of commonly used mechanisms, such as levers, wheels, pulleys, screws and gears.
Laboratory reports

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	2	I	Orientation and Safety A. Engineering overview B. Career opportunities C. Engineering education
Lab	3	II	Orientation and Careers A. Career research lab B. Engineering, Engineering Technology and Science differences research lab
Lecture	3	III	Communication and Documentation A. Technical writing B. Data representation and presentation C. Computer tools
Lab	6	IV	Communication and Documentation A. Perspective sketching lab B. Orthographic sketching lab

Lecture	3	V	The Design Process A. Problem identification, design brief B. Information gathering C. Alternative solutions and optimization D. Modeling E. Testing, evaluation F. Presentation
Lab	8	VI	The Design Process A. Product lifecycle lab B. Invention research lab
Lecture	2	VII	Forms of Energy A. Kinetic B. Electrical C. Potential D. Chemical E. Thermal
Lab	7	VIII	Forms of Energy A. Heat engines lab B. Energy forms lab
Lecture	8	IX	Engineering Systems A. Simple machines - levers B. Pulleys C. Screws D. Gears E. Linkages
Lab	12	X	Engineering Systems A. Fischertechnics exercises B. Marble sorter lab
Total Lecture Hours		18	
Total Laboratory Hours		36	
Total Hours		54	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

A mousetrap is a good example of how energy can be transmitted to perform some kind of work. Design a mousetrap-powered vehicle that will travel 12 feet, no more – no less. Submit a sketch of your design concept to instructor for assessment.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. From design sketches created for the mousetrap-powered vehicle, produce a 3-D model using parametric modeling techniques. Electronically send the model file to the instructor for evaluation.

2. Access the file name "ping Pong ball-launcher" in the student training directory. Modify the solid model of the base as indicated on the change specification. Calculate the angle needed to propel the projectile between 12 and 15 feet. Submit your calculations on the lab report to the instructor for evaluation.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Performance exams
Other exams
Quizzes
Written homework
Laboratory reports
Class Performance
Multiple Choice
Completion
Matching Items
True/False

V. INSTRUCTIONAL METHODS

Demonstration
Laboratory
Lecture
Multimedia presentations

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study
Answer questions
Required reading
Problem solving activities

Estimated Independent Study Hours per Week: 2

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Michael Hacker. Engineering & Technology. 1st ed. Delmar Cengage Learning, 2010.
Industry Standard

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
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B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
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D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by Eric Carlson on 09/01/2008.

BOARD APPROVAL DATE: 12/15/2008

LAST BOARD APPROVAL DATE: 06/15/2020

Last Reviewed and Revised by: Eric Carlson

Date: May 8, 2020

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