



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

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

Catalog Description:

This is the second 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 statics, properties of materials, quality assurance, materials testing and engineering for reliability.

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

Conditions of Enrollment:

Recommended Preparation: Engineering Technology 10A

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 Marble Sorter

Students will build an automated marble sorter.

SLO #2 Optimized Bridge

Students will build an optimized bridge using West Point Bridge simulation software.

SLO #3 Bridge Construction & Testing

Students will build a bridge from popsicle sticks and load test their design to failure.

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. Evaluate the properties, characteristics and application of materials commonly used in manufacturing.
Laboratory reports
1. Specify destructive and non-destructive means of testing materials commonly used in manufacturing.
Laboratory reports
2. Explain the effects that stress has on a material and explain how a particular material will react.
Laboratory reports
3. Analyze a simple truss to determine types and magnitude of forces that act on the truss.
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	Safety A. Engineering overview B. Career opportunities C. Engineering education
Lab	4	II	Careers A. Career research lab B. Engineering, Engineering Technology and Science differences research lab
Lecture	5	III	Engineering Systems A. Thermodynamics B. Fluid systems C. Electrical systems
Lab	10	IV	Engineering Systems A. Fluid power lab B. Electrical power lab

Lecture	5	V	Statics and Strength of Materials A. Statics terminology B. Strength of materials terminology C. Materials testing D. Properties of materials E. Production processes F. Quality
Lab	10	VI	Statics A. Bridgebuilder lab B. Vector components lab
Lecture	3	VII	Engineering for Reliability A. Reliability definitions B. Case studies
Lab	6	VIII	Reliability A. Reliability case study lab B. Reliability test lab
Lecture	3	IX	Dynamics and Kinematics A. Linear motion B. Rotary motion
Lab	6	X	Dynamics A. Pingpong ball projectile device lab B. Dynamics calculations 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:

Using a three pulley block and tackle pulley system, calculate the number of stands that will be needed to lift a weight of 1092 lbs. by applying 80 pounds of force. Complete calculations on a lab report and submit to the instructor.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Perform "Mass-Property-Analysis" on an assigned container using the Autodesk software analysis feature. Create a chart of the analysis and submit chart to the instructor.
2. Predict mathematically the shearing forces of a .125" thick piece of C-1020 mild steel. Verify the predictions through standard laboratory practices. Record your calculations, prediction and actual findings on a Materials Testing Laboratory Report Form and submit to the instructor.

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.
Qualifier Text: 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
------------	----------------------------

B. Requisite Skills

Requisite Skills
Ability to understand essential components contained in a basic mechanical system. ETEC 10A - Compare and contrast essential components contained in a basic mechanical system.
Ability to have an understanding of energy. ETEC 10A - Compare and contrast various forms of energy.
Ability to document design ideas. ETEC 10A - Document design ideas graphically and in writing.

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation Engineering Technology-10A	

D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
-------------------------------------	-------------------------------

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
20087

Date: May 8, 2020