TAFT COLLEGE
West Kern Community College District

Prepared by: P. Blake
Reviewed by: G. Golling
Reviewed by: S. Aunai
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Board approved: November 13, 2013

Engineering (ENGR) 1500 Introduction to Engineering (2 Units) CSU:UC

Prerequisite: none

Advisory: none

Total Hours: 32 hours lecture

Catalog Description: This course explores the branches of engineering, the functions of an engineer, and the industries in which they work. It explains the engineering education pathways and explores effective strategies for students to reach their full academic potential. This course also presents an introduction to the methods and tools of design and problem solving. Finally, this course introduces and develops ethical, communication and teamwork skills for the professional engineer. Fieldtrips will be required.

Type of Class/Course: Transfer Degree Credit

Text: Landis, Raymond. *Studying Engineering: A Road Map to a Rewarding Career*. 4th ed. Los Angeles: Discovery P, 2013. Print.

Course Objectives:

Upon successful completion of the course, students will be able to:

1. Describe the role of engineers in society and classify the different engineering branches, the functions of an engineer and industries in which they work,
2. Identify and describe academic pathways to four-year degrees,
3. Develop and apply effective strategies to succeed academically,
4. Explain engineering ethical principles and standards,
5. Demonstrate knowledge of effective practices for writing technical engineering documents, making oral presentations, and communication,
6. Analyze engineering problems using the engineering design process, and
7. Demonstrate teamwork skills in working on an engineering design team.

Course Scope and Content:

Unit I Introduction to Engineering
- A. Role in Society
- B. Comparison and roles of science, engineering, technology, designers and technicians

Unit II Engineering Profession
- A. Branches / Types
- B. Titles
- C. Technical & Managerial Career Paths

D. Compensation

Unit III Being a Professional
- A. Professionalism & Responsibility
- B. Ethics
- C. Communication & Collaboration
- D. Professional Engineering Title
- E. Professional Societies

Unit IV Engineering Education
- A. Academic Success and preparation for upper level classes
- B. Curriculum
- C. Where to go for help

Unit V Engineering Design
- A. Design Principles and the Product Development Process
- B. Creativity & Problem Solving
- C. Tradeoffs and Economics
- D. Process Management
- E. Quality and Reliability

Unit VI Engineering Tools
- A. Computer Aided Design/Computer Aided Manufacturing (CAD/CAM)
- B. Numerical computation, visualization, and programming (MATLAB)
- C. Design Simulation
- D. Project Management
- E. 3D Printing

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 4 hours per week outside of the regular class time doing the following:

1. Studying assigned text, handout materials, and class notes
2. Reviewing and preparing for quizzes, midterm, and final exams
3. Completing individual and team projects

Methods of Instruction:

1. Lecture, demonstrations, and discussions
2. Individual projects with emphasis on hands-on work
3. Group projects with emphasis on design creativity, problem solving, and teamwork
4. Field Trip(s)
5. Guest Lecture(s)

Methods of Evaluation:

1. Quizzes
2. Exams
3. Participation
4. Individual and group assignments & projects

5. Written design reports & oral presentations
6. Case studies and scenarios