

Virginia Western Community College

EGR 105L

Introduction to Problem Solving Technology

Prerequisites

There are no prerequisites for this course

Course Description

Teaches engineering problem solving, using hand held calculator. Applies computers to solving problems. This course is designed for beginning engineering and technical students. The solution of technical problems requires developing habits of neatness and organization. In engineering problem solving, we will be using hand held calculators and computer software applications.

The objective for this course is to prepare the student for designing and creating structures and machinery for modern living which involve a great deal of problem solving. Engineers must be able to design equipment which is safe and reliable. They must also be able to design for cost effectiveness so that their projects are affordable and competitive. The technician, as an engineering assistant, is responsible for much of the problem solving involved.

In this effort the student will learn to properly document problems. This will include providing carefully drawn sketches with proper dimensions; stating what is given in the problem and what is required. The student will learn to include any formula that is involved, making sure that proper units are used. In solving the problem the student will learn to show their work. Upon conclusion the student will learn to underline the answer so that it stands out clearly. All the while the student will learn to ensure that the proper units are part of the answer.

Semester Credits: 1 Lecture Hours: Lab/Recitation Hours: 3



Required Materials

Textbook:

No textbook required.

Optional: Engineering Technology Problem Solving “Techniques Using Electronic Calculators”, second edition, Houston N. Irvine – Available on line

Other required materials:

Each class session you are required to bring paper, pencil, a clean eraser, and a scientific calculator. Please become completely familiar with your calculator functions prior to the beginning of our course – know your calculator!

The following supplementary materials are available:

Tooling on-line courseware will be referenced in class

Course Outcomes

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

1. Use problem-solving skills for solving realistic engineering problems using problem-based learning techniques
2. Identify the steps in the problem-solving cycle
3. Provide students with experience in solving problems in both International System of Units (SI) and customary units (English units) while presenting solutions in a logical manner
4. Analyze and solve a wide range of technical problems
5. Utilize Scientific calculators to solve Engineering Technology problems
6. Develop computer skills to solve Engineering Technology problems
7. Clearly document a problem such that one can look at the solution a year from now and easily understand what was done.



Topical Description

Week	Topic
1	Introduction to Problem Solving
2, 3	Simple Applied Problems
4	Reciprocals, Powers, and Roots
5	Trigonometric Functions
6	Physics Problems and Formula Rearrangement
7, 8	Calculation of Volumes, Centroids, and Center of Gravity
9, 10	Logarithms and Exponentials
11, 12	Applications of Higher Mathematics
13	Principal and Interest
14	Statistical Problems
15	Unique function of various calculator brands

Notes to Instructors:

- 1. The final exam is worth 15% of the final grade.**

