

STATUS:   A  

COMMON COURSE NUMBER:   EGS 1001  

COURSE TITLE:   Introduction to Engineering  

CREDIT HOURS:           3          

**CONTACT HOURS BREAKDOWN:**

Lecture/Discussion           48          

Lab           00          

Other           00          

Contact Hours/Week           3          

**CATALOG COURSE DESCRIPTION:**

Prerequisite: NONE

Co requisite: NONE

This course is a basic introduction to engineering. It will explore the various engineering fields, engineering problem solving, and basic mathematics and physics used by engineers. Other topics such as safety, ethics, and engineering communications will also be addressed.

**UNIT TITLES:**

1. **Careers and Activities in Engineering**
2. **How to Study in Engineering**
3. **Computers in Engineering**
4. **Problem Solving**
5. **Human Relations in Engineering**
6. **Quality Assurance**
7. **Basic Physics**
8. **Creativity in Engineering**

## I. Course Overview:

Upon successful completion of this course, the students should be able to develop an understanding of basic engineering concepts, such as, problem solving, introductory mathematics, geometry, and science concepts, as well as the various specialties in engineering.

## II. Units:

### Unit 1. **Careers and Activities in Engineering**

#### General Outcome:

- 1.0 The students should be able to develop an understanding of the various branches of engineering and describe what engineers do.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Define engineering.
- 1.2 Identify what engineers do and how they work on engineering projects.
- 1.3 Describe electrical/electronic engineering and its specialties.
- 1.4 Describe civil engineering and its specialties.
- 1.5 Describe mechanical engineering and its specialties.
- 1.6 Describe ocean engineering and its specialties.
- 1.7 Describe biomedical engineering and its specialties.
- 1.8 Describe industrial engineering and its specialties.
- 1.9 Describe architectural engineering and its specialties.
- 1.10 Describe chemical engineering and its specialties.

## Unit 2. How to Study in Engineering

### General Outcome:

- 2.0 The students should be able to develop an understanding and utilize the various study methods used by engineering students.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Take effective notes in engineering classes.
- 2.2 Use the library and other sources of information.
- 2.3 Study engineering topics in groups of two or more.
- 2.4 Utilize other college resources, such as, learning resources, instructors, and tutors.
- 2.5 Utilize the “reasoning instead of memorization” method of study.

## Unit 3. Computers in Engineering

### General Outcome:

- 3.0 The students should be able to develop an understanding of how computers are used in engineering.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Use the Internet to do research.
- 3.2 Explain the basics of word processing.
- 3.3 Explain the uses of database programs.
- 3.4 Explain how spreadsheet programs are used in engineering.
- 3.5 Explain the basics of computer programming.

## Unit 4. Problem Solving

### General Outcome:

- 4.0 The students should be able to develop an understanding of the methods engineers use to solve problems.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Describe the techniques used to define problems.
- 4.2 Explain the use of brainstorming techniques.
- 4.3 Define problem analysis methods.
- 4.4 Explain solution implementation methods.
- 4.5 Describe the techniques used in documentation and user training.

## Unit 5. Human Relations in Engineering

### General Outcome:

- 5.0 The students should be able to develop an understanding of the basis of human relations in engineering.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Explain the concept of communication cycle.
- 5.2 Write engineering memos and reports.
- 5.3 Do presentations using presentation software, such as PowerPoint.
- 5.4 Work in teams effectively.
- 5.5 Deal with difficult people.
- 5.6 Describe company organization.

## Unit 6. Quality Assurance

### General Outcome:

- 6.0 The students should be able to develop an understanding of the role of quality assurance in engineering.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Define “Total Quality Management.”
- 6.2 Explain the writing of Deming and Crosby.
- 6.3 Explain the importance of engineering design for quality and safety.

## Unit 7. Basic Physics

### General Outcome:

7.0 The students should be able to develop an understanding and utilize basic physics concepts.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 7.1 Employ the systems of units and measurements used in physics.
- 7.2 Define and use the concepts of mass, density, force, and weight density.
- 7.3 Define and utilize Newton's laws of motion.
- 7.4 Define and solve problems using vectors.
- 7.5 Perform conversion of units of:
  - 7.5.1 Length (Meter, centimeter, millimeter, inch, foot kilometer statute mile)
  - 7.5.2 Force (Newton, dyne, kilogram, pound, kip)
  - 7.5.3 Temperature (Celsius, Fahrenheit, Kelvin, Rankine)
  - 7.5.4 Pressure (Pascal, bar, millibar, atmosphere and psi)
  - 7.5.5 Energy (Joule, erg, m.kg, ft. lb, Kw.hr)
  - 7.5.6 Power (Watts, hp)

## Unit 8. Creativity in Engineering

### General Outcome:

- 8.0 The students should be able to develop an understanding and apply the basic concepts of creativity.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 8.1 Define what creativity means.
- 8.2 Identify the basic misconceptions about creativity.
- 8.3 Identify and learn how to remove the most common “blocks” to being creative.
- 8.4 Identify the creative attitude.
- 8.5 Demonstrate creativity by applying creative problem-solving techniques to common engineering problems.