

# Virginia Community College Course Content Summary

**Course Title:** EGR 121: Foundations of Engineering

## **Course Description**

Introduces the engineering profession and its impact on society and the environment, including engineering problem solving, the engineering design process, and professional practices. Covers fundamental engineering calculations, descriptive statistics, basic spreadsheet and mathematical scripting language applications, professional ethics, teamwork, and communication. Lecture 2 hours per week. 2 credits. Prerequisite: MTH 162 or MTH 167 or equivalent and ENG 111 eligible, or departmental permission.

## **General Course Purpose**

Prepare students for further study in any Engineering curriculum.

## **Course Prerequisites/Corequisites**

MTH 162 or MTH 167 or equivalent and ENG 111 eligible, or departmental permission.

## **Course Objectives**

Upon completing the course, the student will be able to:

Problem Solving

- Identify and solve problems using engineering methodologies

Information Literacy

- Find, evaluate, and effectively use technical information, including scholarly literature

Technology Application

- Use spreadsheet, word processing and presentation software to collect, organize, analyze and present engineering data

Communication

- Effectively communicate engineering work in oral, written, and visual formats, using graphical information as relevant

Collaboration

- Form, plan, and complete team-based engineering work

Intro to Engineering Profession

- Demonstrate knowledge of the Engineering profession including engineering disciplines, professional societies, accreditation, and licensing.

Professional Ethics

- Demonstrate an understanding of basic engineering ethics concepts using a professional engineering society code of ethics

Problem Solving

- Use systematic methods to create a proper engineering solution including formulation, representation, assumptions, questioning, communication, and evaluation.
- Analyze flowchart algorithms using standard symbols.

Design Process

- Demonstrate basic understanding of the engineering design process including needs identification, specification, analysis of design alternatives, planning, prototyping, testing, and delivery
- Consider sustainability and global, societal and environmental impacts of design options

Significant Figures and Dimensional Analysis

- Understand and apply significant figures and appropriate number representations.
- Solve problems using unit conversions in both AES and SI units, and dimensional analysis.

Technology Skills

- Utilize basic spreadsheet software skills including built-in and user-defined functions, graphing, and trendlines
- Create mathematical software scripts, including inputs, outputs, graphing, and conditional statements

Course Prefix and Number \_\_\_\_\_ (To be assigned by the VCCS)

Technology Application

- Build and use data to control a simple physical system with input and output
- Analyze data using basic descriptive statistics, histograms, and linear trendlines

**Major Topics to be Included**

Problem Solving

Information Literacy

Technology Application

Communication

Collaboration

Introduction Engineering Profession

Professional Ethics

Problem Solving

Design Process

Significant Figures and Dimensional Analysis

Technology Skills

Technology Application

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(To be completed by VCCS) Course Approved: Month \_\_\_\_\_ Year \_\_\_\_\_