

# Course Syllabus

**Department:** Science & Technology

**Date:** 01-31-2015

## I. Course Prefix and Number: ESC 100

**Course Name:** Introduction to Engineering

**Credit Hours and Contact Hours:** 3 credit hrs (2 lec hrs, 2 lab hrs)

**Catalog Description including pre- and co-requisites:** *supporting data required for grade prerequisite of 'C' or higher.*

An introduction to various branches of engineering using descriptive and quantitative perspectives. Topics include modeling, analysis, and experimental investigation of basic engineering problems related to chemical, mechanical, and electrical systems with special focus on sustainability and clean environment. Team work, problem solving, and critical thinking as well as oral and written communication skills are emphasized throughout the course. Co-Requisite: MAT 145

### **Relationship to Academic Programs and Curriculum including SUNY Gen Ed designation if applicable:**

This course is required primarily for the students in the Engineering Science program. Its main purpose is to familiarize the student with various fields of engineering from a descriptive and technical point of view, so that they can make a more informed decision in selecting their specific field of engineering and in planning their transfer to a four-year school. Other students from other programs may also take the course to learn about engineering and its principles. This course is not a SUNY Gen Ed designated course.

## II. Course Student Learning Outcomes: *State the student learning outcome(s) for the course (e.g. Student will be able to identify...)*

Upon completion of the course, student will be able to:

1. Define engineering and its various branches.
2. Identify the various career paths that can be pursued with an engineering degree.
3. Discuss the components of a modern engineering education.
4. Use engineering analysis tools to solve basic, introductory level engineering problems involving mechanical or electrical systems.

**College Learning Outcomes Addressed by the Course:** *(check each College Learning Outcome addressed by the Student Learning Outcomes)*

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> writing             | <input checked="" type="checkbox"/> computer literacy |
| <input checked="" type="checkbox"/> oral communications | <input type="checkbox"/> ethics/values                |
| <input checked="" type="checkbox"/> reading             | <input type="checkbox"/> citizenship                  |
| <input checked="" type="checkbox"/> mathematics         | <input checked="" type="checkbox"/> global concerns   |
| <input checked="" type="checkbox"/> critical thinking   | <input type="checkbox"/> information resources        |

**III. Assessment Measures (Summarize how the college and student learning outcomes will be assessed):** *For each identified outcome checked, please provide the specific assessment measure.*

List identified College Learning Outcomes(s)	Specific assessment measure(s)
<i>eg: writing</i>	<i>eg: student will complete a research paper</i>
Writing	Student will complete a lab report
Oral communications	Student will give a presentation
Reading	Student will complete a lab report
Mathematics	Student will answer specific test questions correctly
Critical thinking	Student will answer specific test questions correctly
Computer literacy	Student will complete a lab report
Global concerns	Student will complete a lab report

**IV. Instructional Materials and Methods**

**Types of Course Materials:**

No textbook is required for this course. Instructor notes are the main source of information for the course content. A course website is maintained on the internet for lecture and lab notes, course calendar, and other course related material. All lab equipment such as the wind tunnel, the tensile tester, laptops with specific engineering software, etc. are available in the engineering lab for student use.

**Methods of Instruction (e.g. Lecture, Lab, Seminar ...):**

Instruction in the course involves a mixture of lectures, instructor guided problem solving sessions, and lab experiences.

Lectures are conducted using powerpoint slides and whiteboard notes. Lab experiences are carried out with small student teams, using specific lab equipment.

#### **V. General Outline of Topics Covered:**

- Introduction to engineering
- Branches of engineering
- Engineering education
- Career paths in engineering
- Mechanical, aerospace engineering
- Study of an airfoil in windtunnel
- Electrical engineering
- Renewable energy
- Energy production using photovoltaic cells
- Civil engineering
- Bridge design with trusses
- Truss strength analysis using a tensile tester
- Chemical, environmental engineering
- Air pollution
- Mathematical modeling of a plume and pollution analysis
- Biomedical engineering
- Industrial engineering

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