

## **ENGR 1014: Introduction to Engineering**

This course is required for all Engineering majors.

### Course Coordinator:

Rick Williams

### Catalog Description:

Engineering profession and basic tools and concepts of engineering providing immersive and hands-on experience in engineering practice areas including professional practice, systems thinking and basic concepts in machinery, controls, digital circuits, and data analysis.

### Course Structure:

One 50-minute lecture and two 2-hour laboratory/recitation sessions per week (three credits)

### Prerequisites:

None.

### Required Materials:

1. *2007 SolidWorks CAD program (utilize the site license).*
2. *Current Newspapers*
  - *USA Today*
  - *The New York Times*
  - *The Raleigh News and Observer*
  - *The Greenville Daily Reflector*

### Course Outcomes::

Upon completion of this course, students shall be able to:

- Describe the engineering profession and its major disciplines including professional practice, registration and ethics
- Conduct a technical presentation related to a student team design project
- Utilize knowledge of project management in an engineering design process
- Utilize knowledge of teamwork in an engineering design process
- Utilize the Office suite software and spreadsheets to solve engineering problems and analyze data
- Describe the basic components and operation of a mechanical and electrical systems
- Describe the systematic approach for solving well defined engineering problems
- Apply pre-calculus mathematics to engineering problem solving

### Lecture Topics:

- Course overview (1 lecture)
- Engineering profession and its major disciplines (1 lecture)
- Systematic approach for solving well defined engineering problems (1 lecture)
- Technical and laboratory report writing (2 lectures)
- Technical presentations (2 lectures)
- Midterm (1 lecture)
- Project management tools applied to the engineering design process (1 lecture)
- The design process (1 lecture)

- Effective teamwork and human relations skills in the engineering workplace (1 lecture)
- Professional registration and ethics in engineering (2 lectures)
- Review (1 lecture)

Laboratory/Recitation Topics: This course has two 2-hour labs. One lab is called the “engineering lab” and the second lab the “robot lab”.

<b>Engineering Laboratory Topics</b>	<b>Robot Laboratory Topics</b>
Lab Safety	Project Introduction
Basic Stamp Programming	Build Chassis
Basic Circuit Analysis	Motor Calibration
Battery Capacity Study	Navigation
Position, Velocity, Acceleration	Road Rally Prep
Loops and Logic	Road Rally Challenge
Sensors	Sensors
Work and Mechanical Advantage	Sensors Challenge
Pneumatics	Robot Challenge Preparation
Engineering Failure Presentation	Robot Challenge Preparation
Robot Challenge Preparation	Robot Challenge Preparation
Robot Challenge Preparation	Robot Challenge Preparation
Robot Challenge Preparation	Robot Challenge Preparation
Robot Presentation	Robot Challenge

Relevant Program Outcomes:

Graduates of the Engineering Program will demonstrate

- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) an ability to function on multi-disciplinary teams.
- e) an ability to identify, formulate, and solve engineering problems.
- f) an understanding of professional and ethical responsibility.
- g) the ability to communicate effectively.
- h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- i) a recognition of the need for, and an ability to engage in life-long learning.
- j) a knowledge of contemporary issues.

Professional Component Content:

Math/Science: 0;            Engineering: 3 credits;            General Education: 0

Assessment Requirements:

Student Work Samples:

- Ethics Exam (Outcome f)
- Robot Presentation (Outcome g)
- Failure Presentation (Outcome h)

Student Course Survey

Last Review:

December 18, 2007 by Rick Williams