Course Number: ENGR 101

Department: ENGR (General Engineering)

Course Title: Introduction to Engineering

Course Designation: required course

Catalog Description: An introduction to engineering with consideration of real engineering problems, such as those identified as Engineering Grand Challenges by the National Academy of Engineering. This course is taught in a project-based learning environment.

Prerequisites: none

Credit Hours: 2 credits, lecture type

Semester/Year: Fall / 2016

Course days, time, duration:
Section 1: Mon, 1:20 pm - 3:10 pm, full semester
Section 2: Tues, 1:20 pm - 3:10 pm, full semester
Section 3: Wed, 1:20 pm - 3:10 pm, full semester

Class location: 244 McMahon

Instructor name/title: William Carlson, Professor

Office location: 338A McMahon

Office hours: 11:20 am -12:10 pm MTW

E-mail address: carlson@alfred.edu

Website URL: http://mechanics.alfred.edu/ note: class is the official source of information

Course Outcomes: are related to ABET (Accreditation Board for Engineering and Technology) criteria for meeting program outcomes: a, b,d, e, and k:
Outcome a: "an ability to apply knowledge of mathematics, science, and engineering"
Outcome b: "an ability to design and conduct experiments, as well as to analyze and interpret data"
Outcome d: "an ability to function on multi-disciplinary teams"
Outcome e: "an ability to identify, formulate, and solve engineering problems"
Outcome k: "an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice"

Relationship of course to program outcomes:
a. introduction to the knowledge of mathematics (algebra, trig.), science (investigation), and engineering concepts (group discussion of profession)
b. introduction to design (diagram) problems and interpretation of data (paper study)
d. initial focus on multidisciplinary (small team approach) coordination
e. initial efforts to formulate (research) and solve (template approach) engineering problems
k. introduction to techniques (unit conversion) and tools (spreadsheets) for engineering practice
g

Contribution of course to meeting curriculum requirements:
1. contributes to cooperative work of students in small teams
2. introduction of basic concepts of engineering and quantification of problems.

or 5th edition.

Other resources: The Grand Challenges for Engineering
http://www.engineeringchallenges.org/

Course Outline: What/who is an engineer and how do they become engineers?
1) Syllabus
2) Units
3) Bridge project
4) Engineering Grand Challenges
5) Bridge Competition: October 19 6:30 PM
6) Mechanics
7) Thermal mechanics
8) Electricity
9) Energy and energy conversion
10) Engineering ‘tools’: spreadsheets, mathematical computation, statistics

Grand Challenges:
1) Make Solar Energy Economical
2) Provide Energy from Fusion
3) Develop Carbon Sequestration Methods
4) Manage the Nitrogen Cycle
5) Provide Access to Clean Water
6) Restore and Improve Urban Infrastructure
7) Advance Health Informatics
8) Engineer Better Medicines
9) Reverse-Engineer the Brain
10) Prevent Nuclear Terror
11) Secure Cyberspace
12) Enhance Virtual Reality
13) Advance Personalized Learning
14) Engineer the Tools of Scientific Discovery

Required Materials/Supplies: n/a

Assessment Methods: homework assignments, quizzes, project(s), paper(s)

Due dates: will be assigned in class

Grading: weighting: homework 20%, quizzes 30%, project 30%, exams 20% process: total points in each assessment method is weighted, assessments summed, and the total is used to evaluate the grade.

Attendance Policy: attendance is mandatory, points will be deducted for absences except for excused sports, field trips, and/or illness with excuse. Advanced notification of professor is required for an excused activity.

Laboratory safety: n/a

Make-up policy: per discretion of professor for excused sports, field trip, and illness with excuse.
Late work policy: all work is to be completed as scheduled. Late work will be penalized.

Extra credit policy: n/a

Laboratory hours: n/a

Academic misconduct policy: refer to AU Policy 700 on Academic Dishonesty: 
http://my.alfred.edu/index.cfm/fuseaction/academic_policies.academic_regulation_ug.cfm