JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

Syllabus – Engineering Innovation
General Engineering 500.110
Summer 2019

Description

Engineering Innovation is an exciting college-level summer program for motivated high school students with an aptitude in math and science and an interest in (or curiosity about) engineering. This program has been available to high school students since 2006. In the program, students learn to think and problem-solve like engineers and have the opportunity to earn Johns Hopkins University (JHU) credit.

Visit our website for more information: **https://ei.jhu.edu**

Prerequisites

High school algebra II and trigonometry
High school chemistry or physics
As and Bs in high school math and science courses

Course Dates/Times:

Monday – Friday: June 24 – July 19, 2019 9:00 AM – 3:00 PM No Class July 4, 2019

Additional assistance: If you have any questions on lectures, laboratories, computer exercises, etc… please ask for help. The instructor, teaching fellow, and teaching assistant are available before and after class most days. Additionally, they are available via email throughout the course.

Required Materials

Course materials are located on Blackboard: https://blackboard.jhu.edu
Login to Blackboard using your Johns Hopkins credentials (JHED Login ID), which you should have received in an email from the registrar. It is a string of 3-8 characters that typically begins with the first letter of your first name, contains the starting letters of your last name, and ends in a number. If you need assistance logging in, please email webregistration@jhu.edu or call 410-516-8080.

Calculator: You must have a dedicated scientific calculator to complete the weekly quizzes. You will not be permitted to use a calculator application on a cell phone during quizzes.

No Required Textbook.

Course Objectives

- To introduce students to prevalent topics in engineering
- To prepare students for rigorous college engineering programs
- To help students develop problem solving strategies and confidence
- To assist students in determining whether engineering is a career they are interested in pursuing

Course Topics and Tentative Schedule

- Week 1:
  - Units and Dimensions
  - Data Analysis
  - Materials
- Week 2:
  - Statics and Structures
  - Electronics

- Week 3:
    - Chemical Processes
    - Finance
- Week 4:
    - Spaghetti Bridge Building
    - Final Exam
    - Bridge Breaking Ceremony – the last day of class – family and friends are invited

Course Expectations & Grading

Classwork – 15%

Lab reports, oral presentations, instructor assigned homework, projects, class participation, tardiness. At the end of the course, points will be added or subtracted so the average for each section is 87%.

Weekly Quizzes – 30%

One-hour weekly quizzes will be taken in class on Monday (dates below). You may use a dedicated calculator; cell phone calculators are not permitted. Your teacher will provide an EI Reference Packet with important equations. You may also bring one letter-size piece of paper, double-sided, with your personal notes. The learning objective lists associated with each quiz are listed below:

- **Quiz 1**: Monday July 1 – Data Analysis, Materials, Units and Dimensions
- **Quiz 2:** Monday July 8 – Statics and Structures, Electronics
- **Quiz 3:** Monday July 15 – Chemical Processes, Finance

Final Exam – 55%

1. Part 1 (worth 15%) will be taken during the first two hours of class on Tuesday July 16. You may use a dedicated calculator, the EI Reference Packet, and four letter-size pieces of paper with personal notes.
2. Part 2 (worth 40%) is a take-home exam given to students after class on Tuesday July 16. Students may use the internet and external resources, but they must work alone. Students will have time to work on this portion during class on Wednesday and it will be due at the start of class on Thursday July 18.

Event	Points	Percentage
Final Exam 2 (take-home)	800	40%
Final Exam 1 (in-class only)	300	15%
Quiz 1	160	8%
Quiz 2	220	11%
Quiz 3	220	11%
Classwork (below)	300	15%
Data Analysis / Excel Lab	20	
Remote Measurement Lab	20	
Strength of Spaghetti Labs	40	
Digital Logic Lab	30	
Chemical Processes Labs	40	
Request For Proposal	30	
Mousetrap Design Lab	20	
Spaghetti Bridge Project	60	
Instructor Points	40	
TOTAL	2000	100%

Letter grades: Students will receive one of three grades at the end of the course: "A", "B", or "No credit". Only students who earn grades of "A" or "B" will receive a Johns Hopkins transcript. All students who complete the program will receive a certificate of completion.

Late assignments: Late assignments will not be accepted. This class moves at a quick pace. Once you get behind in your coursework it will be difficult to catch up.

Extensions: Extensions will only be granted for extenuating circumstances. Requests for extensions MUST be made before the assignment is due.

Absences: Students who miss more than 2 days of class are not eligible to receive JHU credit.

Ethics

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

If a student is suspected of a possible violation of academic ethics, the instructor in charge of the course shall review the evidence and the facts of the case. If the instructor believes that a violation of academic ethics has occurred, the instructor will report the case to the Engineering Innovation Director. The Director will notify each student, who has committed a violation, in writing to the offense and the penalty. The student may either accept the penalty or appeal in writing within fourteen (14) days. The appeal should outline the offense and reasons that the penalty is not just. The appeal should be addressed to the Vice Dean of Engineering Education who will make a final decision based on the appeal.

Potential Penalties

a) Retake of the examination, paper or exercise involved.
b) Score of zero on the examination, paper or exercise involved.
c) Lowering of the course grade.
d) Failure of the course.
e) Failure of the course with a notation on the transcript that the grade was for a violation of academic ethics.

Report any ethics violations you witness to the instructor.

You can find more information about university policies at this website:
http://e-catalog.jhu.edu/undergrad-students/student-life-policies/

Students with Disabilities

Any student with a disability who may need accommodations in this class must obtain an accommodation letter from Student Disability Services, 385 Garland, (410) 516-4720, studentdisabilityservices@jhu.edu. We recommend you contact this office as soon as possible so the accommodations can be arranged in time for the first week of class.