Introduction to Engineering

Dual Enrollment Spring (Optional[1])

Course Description

The Introduction to Engineering course is a course designed to introduce the profession, ethics, and diversity of the field of engineering to students. The course will expose students to the various engineering disciplines: Biological Engineering, Civil Engineering, Chemical Engineering, Computer Science, Construction Management, Electrical Engineering, Environmental Engineering, Industrial Engineering, Mechanical Engineering, and Petroleum Engineering. Specifically, this course will emphasize that the engineer is a team worker who needs strong skills in technical problem solving, engineering design, ethical decision making, and communicating to diverse audiences.

Course Objectives

- Demonstrate an understanding of academic honesty and ethics pertaining to the profession of engineers.
- Demonstrate effective communication skills, through team working, oral presentations, and good written communication.
- Demonstrate an awareness of the connections between engineering and the wider world.
- Use the engineering design process to create, test, and redesign discipline specific projects to gain a better appreciation of the diverse engineering fields.

Assessing Performance

Students are assessed by obtaining weekly grades on the following: Work Ethic, Quizzes, Lab Reports, Presentations, and Reflections.

Equipment	Cost/Unit
Consumable material	$500
Reusable material	$1,000
Classroom set of computers	$0 if you already have some, $500-600 per computer if you need to purchase

First Semester

Unit 1: Ethics and Professionalism*	Engineering Creed, Ethical dilemma situations and discussions
Unit 2: Communication, Teamwork, and Work Ethic*	Oral, Written, Technological, and Visual communication, Value of Work Ethic
Unit 3: Engineering Design Process*	Understand and explore the engineering design process
Unit 4: Lab Report and Presentations	Understand how to write each part of the lab report and the characteristics of a good presentation
Unit 5: Intro to Arduino	Basic electrical circuits and computer programming
Unit 6: Intro to Drafting	Understand Multiview drawings and isometrics
Unit 7: Math and Graphing	Sail Car Activity with velocity and acceleration, make/create a table, make/create a graph, analyze data, dimensional analysis, percent error
Unit 8: Additional Engineering Design	Pick from the Fluor projects if time permits

Second Semester

Unit 9-18: Examination of Disciplines*	Guest Speaker, Hands-on project, Presentation of results for each of 10 engineering disciplines

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[1] This course may be offered in full year format with with Dual enrollment in Spring or simply as a full year non-dual enrollment course

*These units are the dual enrollment content

LSU

Gordon A. Cain Center

INTRODUCTION TO ENGINEERING

1. Materials
A desktop or laptop computer, access to 1-to-1 daily, and Internet. Chromebooks will not work with the free Arduino software.

Reusable Hardware/Material	Recommended Unit	Cost/Unit
Various reusable material and hardware for projects	1 per classroom	$1,000
Consumables		
Various consumables for projects	1 per classroom	$500
Software		
Arduino IDE	1 per student	Free on PC; $1/month for Chromebook

*Complete supply list with purchase links can be found here.

2. Required software, networking access, and access to LSU servers
   - Teachers will need to be able to share documents via Google drive with LSU Instructors. Teachers offering this course for Dual Enrollment credit would also be required to communicate and actively engage with Moodle and Canvas.
   - Arduino software will need to be installed on computers. It is free to download on computers. There is a cloud based version that is also available but requires drivers to be downloaded and will not work on Chromebooks. There is also a Chrome App that can be purchased for $1/student per month (only required for one month). However, IT would have to install it on student chromebooks.

3. Required teacher collaborations
Teachers will communicate with LSU instructors via email and shared Google Drive folder. Required administration of course content, pre/post test, and research instruments
All required materials and instruments will be either posted in a Google drive or their location announced via email.

4. Course Work
Teachers must present the course material in sequence or as approved by collaboration with the LSU Pathway Point-of-Contact. Teachers are expected to deliver a minimum of 80% of the course material.

5. Other
As this is a project-based learning class, we strongly suggest that each section of the course be limited to a *maximum* of 20 students. If the course is overloaded with students, they will not receive adequate instruction.