

Prosthetic Arm Engineering Design Week

Overview

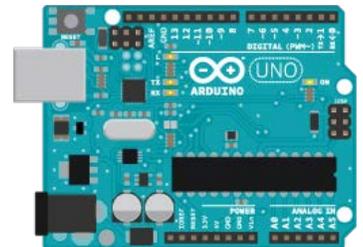
In this course, students will be introduced to the vast field of biomedical engineering within various disciplines. Students will learn about the biomechanics of a prosthetic arm, the biochemical properties of the materials, how to use 3D CAD for modeling and prototyping, electromyography, and basic Arduino programming. They will also have the opportunity to tour the Human Mobility Research Centre at KGH and participate in a Kinematic Arm and Eye-tracking study.

Engineering Design Challenge – Hydraulic Arm

We will introduce the engineering design process by building a hydraulic arm. Students will be tasked with the challenge of creating an arm that can move in two directions using the principles of hydraulics. Using syringes, cardboard and other various materials, the arms will be evaluated on speed, versatility and aesthetic to demonstrate the requirements of prosthetic limbs.

Arduino

Students will learn how to wire circuits to use them with an Arduino Microcontroller. They will also develop their coding skills using to then use the Arduino to control their prosthetic arm.



3D Design Workshop

Students will learn how to design objects using AutoCAD software. Fingers, joints, and the arm will be designed then printed and assembled for the prosthetic hand.



Polymer Synthesis

Students will study the effects of crosslinker concentration on physical characteristics of polymer synthesis products in the Chernoff Hall chemistry lab. They will also use graphical analysis of calorimetry data to develop an understanding of maximum reaction rate.

Human Mobility Research Centre (HMRC)

At the Human Mobility Research Centre, the Faculties of Engineering and Medicine collaborate to develop innovative and effective treatment strategies for bone and joint disorders caused by arthritis, osteoporosis, injury, and more. Students will see the amount of engineering that goes into biomedical research, as well as give an opportunity to see the labs and equipment specific to the discipline.

