



EXPLORE ENGINEERING LAB OPTIONS — SPRING 2017



APPLICATIONS OF COMPUTER VISION (ELECTRICAL AND COMPUTER ENGINEERING)

Learn how algorithms are developed for protecting pipeline infrastructure, tracking objects such as cars, trucks, or a person, under various lighting conditions. This work is critical to homeland security and smart phone apps.

CONCRETE MAKE-OVER (CIVIL ENGINEERING)

In this lab, you will test three different concrete specimens – one plain concrete and two concrete composites. We will demonstrate how composites can improve the properties of plain concrete. This is important in designing structurally sound buildings and transportation systems.

ENGINEERING INNOVATION (INTERDISCIPLINARY)

Explore the “front end of innovation” using a standard, everyday medical device as an example. In this highly interactive session, we'll discuss methods to identify opportunities for improvement, develop novel concepts, and rapidly and inexpensively get feedback on our ideas.

MECHATRONICS (MECHANICAL ENGINEERING)

Engineers today often need to understand how a product's mechanical designs, electrical circuits and programmed functions interact. The area of mechatronics is the study of this intersection, e.g., the Mars Rover, autonomous cars, prostheses or drones. In this experiential learning module, powered origami structures are constructed that emphasize the collaborative design of mechanical and electrical parts that incorporate creative or artistic flair.

MINIMIZING WASTE – LEAN ASSEMBLY (INDUSTRIAL ENGINEERING TECHNOLOGY)

Learn how to reduce waste to improve efficiency of a complex system using lean management and productivity improvement concepts. Students use skills learned to determine the most efficient way to assemble a product. Applications in healthcare, financial and manufacturing industries will be presented.

PRODUCT DEVELOPMENT AND PROTOTYPING (MECHANICAL ENGINEERING TECHNOLOGY)

There are many steps in the engineering design process between an idea and final production. Prototyping is one critical step in the creative design process. Learn about the product development process and build your own functional electro-mechanical prototype.

PRODUCT SUSTAINABILITY (GLOBAL MANUFACTURING SYSTEMS ENGINEERING TECHNOLOGY)

What happens to a product when you are finished with it? Can I just throw it away or toss it in a recycling bin and hope for the best? Students will do a life-cycle analysis on some common products to look at the impact of material choice in the ultimate disposal of a product. They will also come up with creative ways to reduce this impact on our environment.

PROSTHETICS DESIGN (MECHANICAL ENGINEERING)

The human body is a very efficient and flexible machine. If a limb is lost because of injury or disease, how can we replace the limb with regard to look and functionality? Designing a replacement limb combines knowledge about human biology and robotic systems. In this session, students devise their own list of prosthetic design considerations and features and compare them against past and present devices. Students also test several robotic arm toys that incorporate different movement abilities and actuation methods using a clinical functionality test (Box and Blocks) and other measures.

REFRIGERATING VACCINES IN DEVELOPING COUNTRIES (CHEMICAL ENGINEERING)

How do you refrigerate vaccines in developing countries when there is no electricity for a refrigerator? Learn how to boil water at room temperature and run a refrigerator without electricity as we explore the relationship between boiling point temperature and pressure.

ROBOTS AND SENSORS (ELECTRICAL AND COMPUTER ENGINEERING)

Robots need sensing capabilities, so they can explore and understand their environment to automate a given task. Robots are important to various tasks, such as responding to a crisis situation or manufacturing products. In this session, students build and program LEGO robots that use various sensors. The session also includes a tour of our robotics lab, which demonstrates sensors applied to industrial robots.



School of Engineering