EXPLORE ENGINEERING
LAB OPTIONS — SPRING 2018

AMPLIFY YOUR CREATIVITY (ALL ENGINEERING DISCIPLINES)

Ever wonder how to turn one good idea into a hundred possibilities? When generating new ideas, most people rely on brainstorming alone, which is a good way to start. In this session, you'll discover other fun and creative techniques that increase the quantity and quality of novel ideas. During this highly interactive session, we'll explore three additional techniques to generate ideas for an everyday medical device (stethoscopes).

BIOMEDICAL SENSORS AND INSTRUMENTATION (ELECTRICAL AND COMPUTER ENGINEERING)

Biomedical engineering is the application of engineering design principles to the fields of medicine and biology. Understand anatomy and physiology is key to the successful design of sensors and instrumentation used for health care diagnosis and preventative care. In this module, students will learn about cardiac electrophysiology and biomechanics of the human heart, and build an electronic circuit to monitor heart rate using photoplethysmography, an optical technique used in wearable health monitors and fitness trackers.

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, which is important in designing structurally sound buildings and transportation systems.

Solar Energy (Renewable & Clean Energy/Mechanical Engineering)

Solar energy is not only a clean and renewable source of energy, but also, for those in developing countries without an electric grid, it represents perhaps the only source of electricity. Explore the basic workings of the science and technology behind solar photovoltaic electricity by assembling and testing a solar cell apparatus connected to a real electrical circuit.

MECHATRONICS (MECHANICAL ENGINEERING)

Today's engineers often need to understand how 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 module, powered origami structures are constructed that emphasize designing mechanical and electrical parts that work together and 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 will use skills learned to determine the most efficient way to assemble a product. Applications in the healthcare, financial, 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 product 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? In this session, you'll complete a life cycle analysis on common products to look at the impact of material choice in the ultimate disposal of a product and will discover creative ways to reduce this impact on our environment.

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 the 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 will build and program LEGO robots that use various sensors. The session also includes a tour of our robotics lab, showing sensors applied to industrial robots.

UNIVERSITY of DAYTON
School of Engineering