Discover Engineering

Sponsored by Lola and George Aiken Fund

Workshop Descriptions

These workshops will run for 1 hour and are offered from **12 noon – 1 pm** and **1: 30 pm – 2: 30 pm**. During the transition break there will be snacks provided in Innovation Hall.

Learn to Code: Python
Python is a general-purpose, versatile, and powerful programming language. It's a great first language because it's concise and easy to read. Whatever you want to do, Python can do it. From web development to machine learning to data science, Python is the language for you. Come explore the Python language and create a personalized program that you can share with friends and family! Limit 15
Note: participants will be required to bring their own laptops.

Step into a New Dimension! Using 2D materials to create 3D objects (double session)
Join us in the UVM FabLab to make a digital fabrication project! Participants will learn laser cutting techniques used by college students in engineering, art, and architecture. We'll explore ways of creating laser-cutter designs with sustainable materials and how to optimize the use of 2D materials to build 3D objects. Limit 12

Let's Make Robots Go!
Is an intro to tabletop robotics designed for youth aged 8-18. This program helps introduce the critical thinking skills computer scientists and engineers use to write code and "talk" to robots. Programming can be scaled up to learners with prior experience (students who have fluency in Scratch, or the EV3 software, or coding in general) and scaled down to introduce coding at a basic level. We will use the Lego Mindstorm EV3 products. Limit 12 *(geared for grades 5-9 but all welcome)*

What is Nanotechnology: Getting Patients the Medicine They Need
Learn one application for biomedical engineering - how to design medicine-delivery systems at the molecular level. Try an experiment to "see" how this technology works in the body. Limit 20 (*geared for grades 5-9 but all welcome)*

Beam Deflection Study and Relationship to Motor and Pump Design
Come learn about design engineering and the work of Hayward Tyler, a global leader in innovative solutions for performance-critical pumps and motors that perform the most complex applications - with specialization in high pressure, high temperature, and difficult-to-handle fluids. You will measure deflection (vertical position change due to bending) of different size samples/weights secured to the end of a table and use equations to calculate the deflection and compare it to the results from the experiment as well as a computer analysis. Then see how this relates to the work that Hayward Tyler does. This will include things such as a sample of the calculations we do, including how deflection analysis is used and what effect it has on our pumps and motors. Limit 30

Build a Car with UVM's AERO!
Receive a hands-on introduction to engineering from UVM's Alternative Energy Racing Organziation, a student-run club that designs and builds electric and hybrid vehicles to compete at Formula Hybrid, an international collegiate competition! You will learn about the basics of electrical circuits, then apply those concepts to create your own snap circuits! Limit 18 *(geared for grades 5-8 but all welcome)*

Ship the Chip! An Engineering Design Challenge with GlobalFoundries
Packaging engineers have the challenging job to make sure the shipping container works in form and function. It must carry the product safely from supplier to customer while also taking into consideration the cost of the packing and shipping, and the route the product will take in mailing or shipping. In this workshop you will be challenged to create the smallest, lightest package possible to protect the integrity of one potato chop. Learn alongside GlobalFoundries engineers as you dive into the world of the Engineering Design Process and Ship the Chip! Limit 12 *(geared for grades 5-8 but all welcome)*

Aerodynamics 101: How to Design an Efficient Aircraft
Learn the basics of aerodynamics through building, testing, and analyzing the effects of different wings on the same aircraft. Use engineering analysis skills to determine the best wing shape. Participants will also learn about lift and drag with the help of an antique wind tunnel! Limit 15 *(geared for grades 6-8 but all welcome)*

Water Rocket Propulsion (double session)
Ever wonder what makes a rocket blast off into space? Under the guidance of Benchmark Space Systems engineers and propulsion scientists, participants will break into small groups to create and launch water rockets, learning about the science behind the spectacle. A water rocket consists of a cylindrical body filled with water and compressed air. The primary objective will be to estimate the optimal fractional filling of water to obtain the largest maximal speed for our rockets. We'll make predictions about trajectory and flight time and measure the results. Make sure to dress warmly because we will be taking our rockets outdoors! Limit 20 *(geared for grades 9-12)*

Designing Bridges
Learn how bridges are designed from VTrans Bridge Design Engineers, a discipline that stems from Civil Engineering. We'll talk about key principals of designing bridges, forces that need to be resisted, and common shapes and materials used. Participants will take what they learn and build a bridge out of paper that will hold weight. All grades are welcome, we have a few levels of difficulty and participants can challenge themselves further depending how much weight they want their bridge to hold! Limit 30

Precision Measurement Workshop
Learn how to use digital calipers to make a variety of precise measurements of Hazelett Corporation's manufactured parts. These measurements will be compared to the dimensions/tolerances required on associated Computer Aided Drawings. Limit 15 *(geared for grades 9-12)*

Scouts BSA STEM Merit Badge Workshops
The BSA STEM Merit Badge workshops will run from 12 noon – 4:30 pm. Scouts can sign up for one workshop; see separate Scouts BSA information for workshop descriptions