USTEP 2026 Course Catalog

UVA Society of Women Engineers: University Student Taught Engineering Program

Optimization and Policy: How Excel Solver Can (and Can't) Address Public Needs

In this session, we will explore how optimization tools, particularly Excel Solver, can be applied to address real-world policy challenges. Together, we will walk through a simplified policy problem, find an "optimal" solution using Solver, and then step back to discuss what that solution captures as well as what it *overlooks* about community needs, tradeoffs, and equity. This workshop ultimately connects technical problem-solving with critical thinking about the role and limits of data-driven decision-making in public policy.

Design a Life-Saving System: The Emergency Response

In this session, students will explore how engineers design emergency response systems that help save lives during accidents or disasters. Working through a hands-on scenario, students will think about how to detect emergencies, communicate information, and deliver help as quickly as possible. Along the way, we will discuss the tradeoffs engineers face, such as speed, cost, and accessibility, and how thoughtful design can make emergency systems more effective and equitable for everyone.

Who Committed the Crime?

In this session, the students will attempt to solve a crime. They will be given five fingerprints, and they will need to figure out if one of the prints matches the culprit. To solve the crime, we will teach the students the different identifying features of the fingers, which include loops, whorls, and arches. During the activity, we will explain the different types of printing, collection techniques, and how fingerprinting is applied in the real world. In addition to this activity, we will have the students make their own fingerprints with graphite and let them identify their own print.

Are you Smarter than a Computer?

In this session, students will learn how computers can be taught to recognize patterns using examples instead of complicated rules. We'll use a free, interactive Google tool to create simple machine learning models and test how well a computer can recognize things like faces, sounds, or movements. Students will explore real-life applications of machine learning, from social media filters to generative AI. Through this workshop, we'll discover that machine learning isn't magic or a mysterious black box—it depends on the data we give it to help computers make smarter decisions.

The Ice Meltdown Race: The Chemistry of Heat Transfer

In this session, students will explore how different materials affect the melting rate of an ice cube. From silver rings to plastic spoons, students will test, predict, and compete as they discover the surprising science behind heat transfer. We will explore why some metals are such powerful thermal conductors, how energy moves through materials, and how temperature and chemical changes are directly related to one another. By the end of the session, students will have a deeper understanding of the role chemistry plays in the real world, and how engineers and scientists think when approaching problems they are given.

Inside the Wire: How Circuits Really Work

In this session, students will uncover the hidden rules that make electrical circuits come alive. Using hands-on activities and real components, they'll build and test their own circuits on a breadboard—experimenting with LEDs, resistors, switches, and more. As they tinker, students will explore how voltage, current, and resistance interact, and why even small changes in a circuit can lead to big changes in behavior. Students will learn how engineers think when designing safe, efficient circuits, and they'll practice troubleshooting just like real electrical engineers. By the end of the session, students will walk away with a deeper understanding of how electricity powers the world around them.