

# USTEP 2024 Course Catalog

## *A Knack for Problem-Solving: Use It!*

This session will take you through a set of fun and interactive problem-solving exercises. Think riddles, team-building activities, and other surprise challenges! At the end of the session—once you find your "knack" for problem-solving—we will tie everything together by discussing ways in which you can use your knack for bigger change

## *From Experiment to Data: Intro to MATLAB*

In this session, you will be conducting a physics experiment, and learn to model an equation and collect and analyze data in MATLAB! We'll start with doing a short but fun physics experiment where you'll collect your own data, learn how to initialize variables and equations in MATLAB, and finally, we'll plot the data and make graphs and try to figure out what it means! If you're interested in doing your own science experiments and participating in science fairs, this is the perfect place to get started!

## *Are We Alone? The Search for Life in Our Solar System*

Ever wonder if other planets in our solar system can support life? This class delves into the complex geo-chemistry that gives our planet its unique, life-supporting qualities. We'll run through the history of organic life and work together to come up with criteria to look for on other planets. Bring your curiosity and get ready for a fun and informative interstellar adventure!

## *Sherlock Holmes: The Mystery of the Missing Mango*

Interested in logic games? Love solving mysteries? Join us on a puzzling journey to uncover one of Sherlock's mysteries. Dive into the world of problem-solving techniques by helping Sherlock find the stolen mango! You will come up with creative solutions to several challenging scenarios and learn about some common algorithms used in computer science along the way. All you need is your creativity and your brain!

## *Breathe In, Breathe Out*

Are you ready to learn about the mechanisms of breathing? We will explore the respiratory system starting from your nose to your lungs. In this engaging class, we won't just talk about breathing, we'll bring it to life with the help of balloons. From inflating to deflating, you'll witness the magic of modeling your respiratory system. Bring your enthusiasm and curiosity as we delve into the fun world of lung mechanics with the help of balloons!

## *The Thrill of Roller Coaster Design*

Have you ever ridden a roller coaster before? Do you love the thrill of riding up and down the hills? Have you ever wondered how they work? In this class, you will learn some of the simple physics principles behind roller coasters, as well as many of the design principles that engineers consider when creating these amazing rides! After this class, you will look at roller coasters with a new lens and greater understanding