Computer Science Pathway

Do you like creating? What about building your own robot? Do you want to learn to code? Do you often think of new and better ways to perform a task? If your answer is yes to any of these questions, then you have found the right pathway for you. Join us as we explore the exciting world of robotics!

Robotics technology, like other fields within computer engineering, help make people's lives better. Robots are tools that help us achieve things—you may see them being used in hospitals, in farming and transportation applications, for national defense and security, and so much more. Most robots have three main parts: a controller (a brain); mechanical parts to help them move (robots can be powered by air, water, or electricity), and sensors that can tell them about their surroundings. These parts work together to control how a robot functions.

This computer science pathway will introduce you to the Arduino microcontroller and computer programming. Programming topics will include syntax structure, logic flow, and basic conditional statements. You will then proceed to more advanced topics, such as sensor processing and data collection.

Working in small groups of two or three, you will design and build a working model. You will learn robotics, computer coding, analytical thinking, and electronics through fun-filled, hands-on robot-building activities. Emphasis will be on learning the basics of both coding and mechanical design, using a class competition and hands-on Arduino lab experiments. You will be exposed to a variety of current robotics research and will apply what you are learning in this growing career field.

<u>The Competition</u>

Think innovatively and use the engineering design process to solve problems and overcome obstacles!

You will design and build your very own custom robots for the final robot competition at the end of each session. Your robot will be 100% autonomous; once you press the start button, the robot will rely on sensor input such as ultrasonic, light, and/or sound to achieve specific tasks in the competition.

The experience does not end when the program concludes. You will be given an Arduino microcontroller kit so you can continue to refine your computer science skills beyond the 5 days of the program.

We hope that each scholar leaves this pathway with more questions about the computer science and begins to look at these real-world problems with curiosity, innovation, and a desire for discovery.