Robotics 101: Intermediate Robotics: Taking Your Robotics Skills to the Next Level

Monday - Friday, July 18-22, 2016

Class meets at the University of California, San Diego from 8:30am - 3:00pm.

Course Overview

One of the best ways to learn is through doing, which is why this exciting Engineering camp introduces students to both programming and construction processes through **Hands-On robotics challenges**. Students will learn to make sturdy, intelligent robots that can accomplish many different tasks! In this course students will learn how to program the loops, switches, and many different sensors including the touch, sound, ultrasonic (distance), and light sensors. This class will use the Lego Mindstorms robots as a base. There will be multiple challenges that are designed to enhance teamwork, leadership, project management, and learning the course material. A few of the challenges include driving through a maze, picking up tennis balls, and popping balloons on the other team’s robot! These are fairly complex challenges; however students will learn all required skills in class! There are no prerequisites for this class. This class is very beneficial to students just starting to program their Mindstorms kit, or students who want a taste of engineering. All Mindstorms kits and materials will be provided.

Course Goals and Learning Objectives

The goal of this course is to provide a strong and creative foundation in computer science. This is a hands-on class with problem solving at its core. Topics include learning about program design, using functions and loops to complete challenges, and most importantly testing the problem solving skills critical in becoming a successful computer programmer. The course will take the students through the design, development and implementation of their robots. This course promises an unforgettable experience!

The class is geared to advanced middle school students. It is assumed the student has a basic understanding of Windows and using a computer.

How the Class Will Be Taught

This course is taught using classroom and lab instruction employing lecture and demonstration, in-class lab, student participation, and class activities leading to a final project. Classes will include introductory concept presentations, followed by in-class exercises.

Reading

The course will be primarily based on a variety of free handouts and online readings, but the following are highly recommended:
Perdue, David, Valk, Laurens, *The Unofficial Lego Mindstorm NXT 2.0 Inventor’s Guide*
Topics to be Covered During This Workshop

Module 1:
Introduction to Lego Mindstorm NXT
Nxt Introduction
Nxt Editor

Module 2:
Build Basic Robot
Drive forward
Drive reverse
Accelerate, turn and maneuver

Module 3:
Beginning Programming
Drive in Square
Detect Distance
Detect Sound, touch, bumper, ultrasonic
Follow Line

Module 4:
Programming
Move
Loops
Wait/Events
Switches
Blocks

Module 5:
Challenge 1
Incorporate skills to develop a robot capable of completing the challenge.

Module 6:
Challenge 2
Incorporate skills to develop a robot capable of completing the challenge.

Module 7:
Final Project
Incorporate skills to develop special robot project

Instructor: Dusty Fisk, SouthWest Robotics in Science Education

Prerequisites:
- Must be a current middle student in grade 7 - 8.
- An intermediate understanding of robotics with student having gained robotics skills through classroom activities and clubs

Course fee: $260.00.

Registration is open until course is filled. Register early as space fills quickly. Space is limited.

If you have any questions regarding this workshop or the application process, please contact Ange Mason via phone at 858 534-5064 or via email at amason@ucsd.edu.