Fairfax Collegiate

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Raspberry Pi 5-6 Syllabus

Course Goals

1 Linux
Students install a Linux-based operating system and learn to use the terminal window to perform a variety of functions.

2 Python Programming
Students learn the basics of programming in Python which allows them to draw images, control hardware, design games, and more.

3 Electronics
Students learn the basics of circuitry and how to interface with the Raspberry Pi using various hardware.

Course Topics

1 Linux Commands
Students install Raspbian and learn to use basic terminal commands to create, delete, move, and run files.

3 Camera
Students learn to operate the Raspberry Pi camera.

4 Python
Students learn basic principles of programming through the Turtle library and game editing.

5 Sonic Pi
Students learn to use Sonic Pi to create their own music through code.

6 Circuitry
Students learn the basics of electrical theory and familiarize themselves with the breadboard.

7 GPIO
Students learn to use the Raspberry Pi's GPIO pins to interface with different types of hardware.

Course Schedule

Day 1
Course Introduction
Students are introduced to the classroom, their peers, and the instructor.

Setting up the Pi
Students set up their Raspberry Pis and familiarize themselves with the components.

Installation
Students install the Raspberry Pi OS.

Pi Games
Students get a feel for their computers after installing the operating system and setting up their Pis and learn what they can do by playing the Raspberry Pi's pre-installed games.

Day 2
Introduction to Linux
Students learn to navigate through directories and practice performing operations like adding, moving, and deleting files.

Programming with Turtles
Students learn basic programming concepts while using Python's Turtle module to draw shapes and patterns.

Day 3
Programming with Turtles
Students learn basic programming concepts while using Python's Turtle module to draw shapes and patterns.

Lights, Camera, Action!
Students learn to connect and take pictures with the Raspberry Pi camera.

Day 4
Lights, Camera, Action!
Students learn to connect and take pictures with the Raspberry Pi camera.

LEDs and Circuitry
Students learn the basics of electrical circuitry and be able to illuminate an LED on command using code.

Day 5
LEDs and Circuitry
Students learn the basics of electrical circuitry and be able to illuminate an LED on command using code.

Change the Game
Students modify the various built-in games on the Raspberry Pi to familiarize themselves with simple game design concepts.

Day 6
Change the Game
Students modify the various built-in games on the Raspberry Pi to familiarize themselves with simple game design concepts.

Lucky Number 7
Students apply their knowledge of basic circuitry to the more complex 7-segment LEDs.

Day 7
Fast Enough
Students use what they have learned about circuit-building and programming to implement a simple 2 player reaction time game.

Day 8
Music to My Ears
Students create their own music through code using Sonic Pi.

Day 9
Minecraft Pi
Students apply what they know about coding and the Linux terminal to manipulate the Minecraft game world.

Day 10

Updated on 11/21/2024