Central Consolidated School District

Coding/Robotics Camp

June 6 - 23, 2022
Monday - Thursday; 1 PM - 3:30 PM
For all incoming CCSD 6th - 12th Graders

What:
Summer camp funded by
Johnson O'Malley.

Who:
Open to the first registered
(20) Advanced & (20) Beginner
CCSD students.

Locations:
Newcomb Middle, Tse Bit'ai Middle,
Kirtland Central High School

Virtual Camp Instructor:
Level 1 Beginner: Justin A. Begay
Level 2 Advance: Chase McNeil

Camp Registration Link: ccsdnm.org/ICO
https://forms.gle/QBGafoUkY7gaNRXX9

Contact the JOM Supervisor at:
Intercultural & Community Outreach Department
Phone: (505) 368 - 5175 • **Email:** johnsonomalley@centraschools.org
Sponsored by the: Johnson O'Malley Program

Summer of 2022_Beginner Class

In Person (Computer Lab) Schedule

Week 1: Python Basics, Booleans, for loops, arrays

1. Monday 6/6
   a. Introductions and explain what is Python and how it fits into the world of computer science
   b. Make sure students have their Python environment ready
   c. Send survey out to see which areas the students would like to hear presentations about at the end of the course (e.g., AI, advanced robotics, self-driving cars)
   d. Overview of basic data types – strings, floats, booleans
2. Tuesday 6/7
   a. Review of basic data types
   b. Intro to functions, methods, and decomposition
   c. Use turtle program to illustrate functions
   d. Building simple string and math programs
3. Wednesday 6/8
   a. Introduction to arrays
   b. Overview of loops and iteration
   c. Code "Diné Time" program – a program that converts the current time into a phrase in Diné Bizaad
4. Thursday 6/9
   a. Code "Clan Relationships" program – a program that gives the clan relationship between two people based on their clans

Week 2: Beginning robotics

1. Monday 6/13
   a. Introduction to robotics and kits
   b. Go over Do's and Don'ts of working with robot hardware
   c. Get a simple program on robot kits to run (flashing lights)
   d. Show how to get readings from onboard sensors on the robot (accelerometer, temperature, battery voltage)
2. Tuesday 6/14
   a. Get robot to move, program simple motion and paths
   b. Continue with programing simple motion and paths
   c. Introduce using the robot's proximity sensors
3. Wednesday 6/15

a. Begin programming "Hot Pursuit" – use robot's proximity sensors to follow an object

4. Thursday 6/16
   a. Finish programming "Hot Pursuit"
   b. Introduce robot competition – a robot dance off! Place students into groups, and have them design a "dance" program for their robots to move and flash their onboard lights and make a short dance video with their robot

Week 4: End Robotics and Professional Presentations

1. Monday 6/20
   a. Begin programming "Obstacle Course" – have robot navigate obstacles in it's path
2. Tuesday 6/21
   a. Finish programming "Obstacle Course"
3. Wednesday 6/22
   a. Finish robotics – outline future programs the students can code into their robots
   b. Robot Competition Day! – Show videos of robots dancing
4. Thursday 6/24
   a. Show voting results of robot dance off and announce winners
   b. Aiming for two twenty-minute presentations by engineers on advanced topics in robotics and computer science. Topics selected by students at beginning of the course

Summer of 2022_Advanced Class

In Person (Computer Lab) Schedule

Week 1: Review of Python Basics

1. Monday 6/6
   a. Introductions
   b. Review of basic data types – strings, floats, Booleans
   c. Students do basic exercises – addition, subtraction
2. Tuesday 6/7
   a. Review of code structures – loops, counters, functions
   b. Have students play with Python turtle program
3. Wednesday 6/8
   a. Review of robot platform – sensors, motor, lights
   b. Show simple robot code examples and have students try on their robots
4. Thursday 6/9
   a. Begin working on Pursuit Program

Week 2: Booleans, for loops, arrays

1. Monday 6/13
   a. Finish working on Pursuit Program
   b. Begin working on Obstacle Avoidance Program
5. Tuesday 6/14
   c. Continue working Obstacle Avoidance Program
6. Wednesday 6/15
   d. Finish working on Obstacle Avoidance Program
   e. Begin working on Line Following Program
7. Thursday 6/16
   f. Continue working on Line Following Program
8. Friday 6/6
   g. Finish working on Line Following Program
   h. Divide Students into teams, and introduce racing competition
   i. Have students work in their teams

Week 3: Beginning robotics

1. Monday 6/20
   a. Begin working on Custom Trajectory Program
   b. Give Students time to work in their teams

2. Tuesday 6/21
    a. Finish working on Custom Trajectory Program
    b. Give Students time to work int their teams
3. Wednesday 6/22
    a. Students work on their racing programs for first half
    b. Day of Racing Competition!
4. Thursday 6/23
    a. Show results of robot race and announce winners
    b. Finish robotics – outline future programs the students can code into their robots
    c. Aiming for two twenty-minute presentations by engineers on advanced topics in robotics and computer science. Topics selected by students at beginning of the course