On Campus at Pitt-Johnstown

CODE 4 STEM Academy

Summer 2019

CODE 4 STEM Academy Overview

Our Computational-Learning environment and curriculum supports the needs of a ***Changing Student***, ***Advancing Technology***, and an ***Evolving World***. The CODE 4 STEM Academy offers courses during the summer school break for students in grades 2 – 5 and 6 – 9+. Each course includes 30 hours of stimulating activities that build on the power of computational thinking as a problem-solving methodology. Our hands-on summer curriculum provides for hours of exploring new concepts while also learning to make new technology and innovating solutions to real world situations in a coding and design thinking environment. Students will be challenged to apply their skills and knowledge to scenarios presented to them within each course as they learn to work collaboratively, think critically and communicate effectively.

Pitt-Johnstown's CODE 4 STEM Academy offers the following types of summer courses:

Explorer Course (Grades 2-5) – In this course, exciting course themes and daily topics and activities will promote STEM awareness, exploration and learning. Students will learn to ask questions and explore the world through simple activities that are coherent and meaningful to their lives. Skill development priorities include computational and design thinking, coding, creative play and collaboration. Classes include challenge-based activities that students solve using LEGOs, coding and robotics and other materials as tools for learning and self-expression.

Science & Technology Course (Grades 6-9+) – In this course, projects and activities are designed to develop computational thinking, coding and engineering design skills and to build bridges between those skills and how and when to apply them in core academic STEM classes and the real world. Students will learn how to use and make new technology with the practice they get in the variety of projects in each course. Challenge-based learning is also used to develop teamwork and connect to students' interests and community priorities.

CODE 4 STEM Academy Summer 2019

Summer Course Overview

- Schedule
  - 8 weeks of courses from week of June 17 through week of August 12
    - There is a break week for July 4th holiday
  - All courses run for 1 week, from Monday through Friday (9 AM – 4 PM)
    - Includes a lunch break from 12 – 1 PM daily
- Courses and Themes
  - Explorer Courses (Grades 2-5)
    - Oceanic Exploration
    - Sports Science
    - Science of the Human Body
    - Science of Super Powers
  - Science & Technology Courses (Grades 6-9+)
    - Robotics Space Challenge
    - Video Game Development with GameMaker
    - Learn Computer Science with Raspberry Pi
    - Storytelling with Video and Animation
- Fees:
  - (E) Explorer Courses: $200 per course
  - (ST) Science & Technology Courses: $250 per course
- Registration
  - Students may sign up for 1 or more courses
- Location
  - Held at Pitt-Johnstown's Campus
- Camp Information, schedule, descriptions and Online Registration will be available by May 1, 2019 from our website: http://upj.pitt.edu/code

Summer Course Schedule

Location: Pitt-Johnstown	**CODE 4 STEM Academy 2019 Summer Course Schedule**
Date	**Course**
Week of June 17 - 21	(ST) Robotics Space Challenge
Week of June 24 - 28	(E) Oceanic Exploration
Week of June 31	4th of July week – NO COURSE
Week of July 8 - 12	(ST) Video Game Development with GameMaker
Week of July 15 - 19	(E) Sports Science
Week of July 22 - 26	(ST) Learn Computer Science with Raspberry Pi
Week of July 29 – Aug 2	(E) Science of the Human Body
Week of Aug 5 - 9	(ST) Storytelling with Video and Animation
Week of Aug 12 - 16	(E) Science of Superpowers

Course Legend: **(E) Explorer Course (Grades 2-5)** **(ST) Science & Technology Course (Grades 6-9+)**

Summer Course Details

(E) Explorer Courses: Grades 2-5

1. Course: Oceanic Exploration

Date: Week of June 24 - 28

Description: Students will journey from the tropics to the poles, inspect arctic food webs, simulate coral reef adaptations and survey the Mariana Trench. Through action-packed activities, learners discover the physical and geological sciences that underpin ocean life like density, buoyancy, heat transfer, plate tectonics and the water cycle. Students will practice and use coding, design thinking, robotics and engineering to further explore the mysteries of the oceans and open their minds to the role of technology in oceanic exploration.

2. Course: Sports Science

Date: Week of July 15 – 19

Description: This course thrives on action-packed learning experiences as we excite students by bringing STEM to their favorite physical activities. Each day, learners investigate the mechanics of a different movement, connecting STEM concepts like force, motion and the influence of gravity, to their own movements. What does friction have to do with soccer? Why would a football player need to know about unbalanced forces? How would an Olympian hold up against a kangaroo in the long jump? This course will also incorporate technology as tools for learning as students use coding, design thinking, robotics and engineering practices to explore the science of sports.

3. Course: Science of the Human Body

Date: Week of July 29 – Aug 2

Description: Would you like to take a closer look at the microscopic mechanisms of humans? Through hands-on course activities, students unravel the mysteries of the human body by running for a minute to measure heart rate, approximating energy expenditure and discovering the importance of proper nutrition. Students will use math, science and technology to help learn about their bones, muscles, skin, eyes and their mind! Maintaining health and fitness is a lifelong endeavor, and our Science of the Human Body course is the perfect introduction!

4. Course: Science of Superpowers

Date: Week of August 12 – 16

Description: In this Science of Superpowers course, students dive head first into the pages of comic books where collaboration, communication and community awareness reign supreme. Through 5 days of stimulating exercises in biology, engineering and technology, learners fly alongside Superman, sling webs with Spider-Man and recognize real-life heroes as they answer the call for aid. They dissect superhero skill-sets to uncover the science behind superpowers. Daily students will use coding, design thinking, robotics and engineering practices to further explore the science of superpowers.

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(ST) Science & Technology Courses: Grades 6-9+

1. Course: Robotics Space Challenge

Date: Week of June 17 - 21

Description: In this course, students will work together to complete the Apollo 50th Next Giant Leap Student Challenge. This program is designed by NESSP to engage students in technologies relevant for today's society and tomorrow's careers including computer science, earth sciences and engineering. Students will experience the core concepts of computer science and the full engineering design process as they work to build a replica of an Apollo Lunar Module that will be flown using a UAV (drone) and landed on the Moon. Students will also program a Lunar Rover (LEGO Mindstorm) to deliver a payload and collect lunar samples as defined by mission objectives.

2. Course: Video Game Development with GameMaker

Date: Week of July 8 - 12

Description: Have a great idea for a game but don't have any coding experience? Want to create a computer video game but have limited resources or you are not sure how to get started? In this course, students will learn how to develop a basic game using GameMaker Studio and will develop their skills in coding, basic CSS and computational and critical thinking while doing so. The course will help students of all ages learn how to successfully develop their own game ideas and will give them an understanding of the process of game development in general. Students will also get an introduction to web site design using HTML5 when they publish their game for sharing on the internet.

3. Course: Learn Computer Science with Raspberry Pi

Date: Week of July 22 - 26

Description: The Raspberry Pi is a fully-functional, credit-card sized computer, used around the world to teach the fundamentals of Computer Programming. Students will learn the various hardware and software components of the Raspberry Pi and how to turn it into a functioning computer with programming! Then, after some technical skills are mastered, students will take their Raspberry Pi computer to the next level by designing and building their own automated internet-connected gadget. They will learn to control, automate and program a device to do what they want from anywhere, bridging the gap between the physical world and the internet for endless possible projects. Students will received their own Raspberry Pi device to take home at the end of this class.

4. Course: Storytelling with Video and Animation

Date: Week of August 5 - 9

Description: Lights, camera, action! This course empowers students with technical skills in video filming and editing while exploring the unique elements of storytelling. From storyboarding and the rule of thirds to lighting and audio, each activity builds upon the previous day, culminating in a final film project that movie makers proudly share the last day of the course. Students will also learn how animation can be used in storytelling and will develop animations to tell a story of their own using programming as a tool.