UCSD StudentTECH 2020

Computer Science for High School Students

Sponsored by the San Diego Supercomputer Center, University of California, San Diego

Introduction to Apple's Swift Object Oriented Programming Language

Monday- Friday, July 13 - 17, 2020

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



Introduction to Swift Programming Language

Course Overview

This workshop emphasizes Apple's Swift programming language and will introduce Xcode's Integrated Development Environment. Students will learn basic mobile programming language concepts using Swift's syntax and constructs, along with a small samples of iOS views, haptic (touch screen) objects, user interplay, and memory allocation using Swift. Students will focus on problem solving skills through program design and algorithm development using sound software engineering practices. All software in this class is free for use during and after the class ends. Students can/should continue their own development of applying Swift language coding to iPhone, iPad, and Apple Watch App development.

This course will start with the very basics of programming using Apple's Swift programming language, using Swift 5.x in the Xcode Integrated Development Environment. It assumes students do not have any previous programming experience, either desktop or mobile. It does not require any other programming experience.

<u>Swift</u> is a <u>programming language</u> originally developed and released in 2014 by Apple as the core language for its suite of devices (iPhone, iPad, iMac/MacBook, Apple Watch, and Mac tv). Swift will eventually replace Objective-C 2.0 as the language of choice when developing Apps and Applications for Apple devices.

All development will be done on a Macintosh system running Mac OS 10.15.2 or later. Students are expected to bring either a MacBook Pro or MacBook Air laptop to class each day.

Course Goals and Learning Outcomes

- Develop Swift programs that contain sequence, selection and iteration control structures.
- Develop Swift programs that contain methods that may have parameters and a return

type.

• Understand the concepts of Swift Classes and Objects.

Structure

This course is taught using classroom and lab instruction employing lecture/demonstration, inclass exercises, student participation, and class activities leading to a final project. Classes will include introductory concept presentations, followed by in-class exercises. While students are invited to bring their own laptops to class, the UCSD lab will have all necessary hardware and software installed for their use each day.

Topics to be covered during the week

- Module 1: -Introduction to Swift -Introduction to the IDE environment -Swift keywords -Primitive data types -Input/Output
- Module 2: -Conditional Control Structures -Methods -Algorithm Development
- Module 3:-Iterative Control Structures
-Class Design and Method Development
- Module 4: -String Class -GUI Development
- **Module 5:** -Final Projects: Putting the pieces together.

Prerequisites:

- Must be a current high school student in grade 9-12.
- Successful completion of Algebra 2 or Integrated III. Please provide transcripts.
- A basic understanding of computers.