# UCSD Student**TECH** 2020
## Computer Science for High School Students
Sponsored by the San Diego Supercomputer Center, University of California, San Diego

**Introduction to iOS Using Apple's Swift Programming Language**



Monday- Friday, July 20 - 24, 2020

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

## Introduction to Apple's Xcode: the iOS Mobile App Programming Environment using the Swift Programming Language

### Course Overview

This workshop introduces iOS mobile app programming design and development using Apple's Swift programming language and Xcode's Integrated Development Environment. Students will learn basic mobile programming language concepts including Swift's syntax, views, haptic (touch screen) objects, user interplay, memory allocation and control structures. Object oriented concepts will be introduced including iOS' UIKit classes that contain variables and methods. Students will focus on problem solving skills through program design, algorithm development using sound software engineering practices.

This course will start with the very basics, assuming that students do not have any previous mobile programming experience. It does not require any other programming experience. This course will introduce basic programming concepts using the Swift 5.x programming language in the Xcode Integrated Development Environment.

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

All development will be done on a Macintosh system running Mac OS 10.15.x or later.

### Course Goals and Learning Outcomes
• Develop iOS Apps that contain logical sequencing, haptic selection with conditional and iterative control structures.
• Develop a familiarity with iOS Frameworks and the UIKit in particular.
• Develop iOS storyboarding that contain good flow and an intuitive user interface.
• Develop a comfort level with Swift Class/Object design and implementation.

**Structure**

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

*Information on loading all free software will be given to students prior to the first day of class.*

**Topics to be covered during the week**

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| **Module 1:** | -Introduction to Xcode & the Swift Playground |
| | -Data Types and Control Structures |
| | -UIKit and StoryBoard Design |
| | -User Input/Output |
| | |
| **Module 2:** | -Outlets and Actions |
| | -Strings and Methods |
| | -Algorithm Development |
| | |
| **Module 3:** | -Frameworks & Storage |
| | -Tables |
| | -Timers |
| | |
| **Module 4:** | -Classes & Objects |
| | -Animation & SpriteKits |
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| **Module 5:** | -Apple's App Store |
| | -Advanced iOS topics |
| | -Final Project |

**Prerequisites:**
- Must be a current high school student entering grade 9-12.
- Successful completion of Algebra 1 or Integrated I.
- A basic understanding of computers.