CSC 471 / 371 Mobile Application Development for iOS

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CSC 471 Mobile Application Development for iOS

- Winter Quarter AY 2017-18
- Classroom section:
  - Tuesday 5:45 – 9:00 pm
  - Loop Campus
- On-Line Learning (D2L)
  - http://d2l.depaul.edu/
- Course Home Page
  - http://venus.cs.depaul.edu/csc471

Instructor

- Prof. Xiaoping Jia
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- Office Hours:
  - Tuesday 4:00 - 5:30pm
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Prerequisites

- *Data Structures* I & II
  - CSC403 or CSC301 or CSC383 or CSC393
- **And** *Computer Systems* I & II
  - CSC407 or CSC374
- Implies
  - Proficiency in object-oriented programming in Java or C++
  - Understanding of system fundamentals and memory models

Textbooks

- No required textbook.
- Lecture notes and sample code will be provided in D2L.
- Various on-line resources and tutorials may also be helpful.
- Official iOS API, SDK references
  - ***Apple's iOS Development website***
    SDK, Guides, Sample Code,
    http://developer.apple.com/devcenter/ios/index.action

Other References

- *The Swift Programming Language (Swift 4).*
  Apple Inc., eBook: available in iTune
  https://itunes.apple.com/
  On-line:
  https://developer.apple.com/library/mac/documentation/Swift/Conceptual/Swift_Programming_Language/

System Requirements

- You need
  - A Mac computer
  - Mac OS X 10.12.6 or later
    - Sierra, High Sierra

- What if I don't have a Mac?
  - Use the labs at school or borrow a Mac — **Yes**
  - Rent a Mac in the cloud (some limitations) — **Maybe**
  - Mac clones (hackintosh) don't always work — **No**
- *Your code must compile and run in the official Xcode 9*

iOS Devices

- iOS devices (iPhone, iPod, iPad) are optional
- You can use the iOS Simulator for all your assignments and project.
- Some features are not available on the iOS Simulator.
  - Multi-touch gestures or motion sensors, e.g., accelerometer, gyroscope
  - You will need an iOS device to test these features
- If you do have an iOS device, you can test your apps on your device

Apple Developer Program

- DePaul has a Educational Developer's License
  - No need to purchase the developer's license ($99/year) for this class
  - You can do everything with this license except for publishing to the App Store.
  - Tons of developer resources
  - Developer site:
    - http://developr.apple.com/ios/
- Starting Xcode 7, you can test on devices without joining a developer program
  - *Personal Team*, some limitations apply

Tentative Topics

- Introduction to Xcode and iOS SDK
- Introduction to Swift programming language
- iOS application architecture
- Building simple UI and handling interactions
- Storyboard, scenes and segues
- Multi-view applications
- Tabbed views
- Popups
- Table views
- Adaptive and auto layout
- Tablets
- Multi-threads
- Touch events and gestures
- 2D graphics drawing
- Animations & transitions

Grading – Weekly On-Line Quizzes

- 15% - Weekly on-line quizzes in D2L
  - Must be completed before 5:00pm of the day of lecture of the following week
  - Weight distribution:
    - Weeks 1-5: 33%
    - Weeks 6-10: 67%

Grading – Programming Assignments

- 70% - Programming Assignments
  - Weekly *individual* assignments
  - Must use Xcode 9 and Swift 4
  - Assignments will be posted before each lecture and due at 11:59pm of the day following the next lecture.
    - There will be a 6-hour grace period, during which the late penalty will be waived.
  - Start early and finish early!
  - All submissions in D2L.

Grading – Final Project

- 15% - Final Project (due week 11, March 13, 2018)
  - To develop an app of your own
  - Individual or small team project
  - Must use Xcode 9 and Swift 4
  - Project proposal (10%, due week 7, February 13, 2018)
    - Instructor approval is **required!**
  - Deliverable (60%): project code
  - Project demo (10%): a short demo video
  - Documentations & final report (20%)
  - No late submission will be accepted for the final project

Grading – Late Policy

- Late policy for programming assignments
  - 10% penalty for up to 7 days. Additional 10% for each week thereafter.
  - One free pass for an one-week extension.
    - You may only use the free pass on one assignment during the entire quarter. Use it wisely.
    - The free extension pass does not apply to the final project.
  - The last day to submit programming assignments for partial credit is March 6, 2018 (week 10)

Discussion Forum

- You *must* subscribe to the course discussion forum. Do it *as soon as possible*.
  http://groups.google.com/group/csc-371-471-winter-2018
- Post course related questions to the forum
- Students are encouraged to respond to questions
- I will monitor and respond to questions
- The discussion forum is archived.
- If you do not wish to receive messages, you may unsubscribe, or subscribe to a digest.

Why Are We Here?

- To learn to build iOS applications
- To learn about *Software Engineering*, and *Object Oriented Architecture* and *Design*

The Language – Swift

- We will be using Swift 4
  - If you know a modern programming language
    - Such as C++, C#, Java
  - You can learn another language quickly
- Many similarities with Java/C++
  - Loops, conditions, functions, data structures
  - Structure of programs
- Many modern programming concepts
- The Swift language ebook is a good reference

Why Swift?

- The main language iOS uses is Objective-C & Swift
  - SDK, frameworks, libraries, samples
- Swift is modern
  - An alternative to Objective-C, not backward compatible
  - Fully interoperable with Objective-C
  - Swift & Objective-C share the same run-time libraries
- Interesting comparison with designs of C++ and Java
- Popularity is rising! (TIOBE Index)
  - Objective-C: 45 (2007) → 3 (March 2015) → 19 (Nov 2017)
  - Swift: ∞ (Jun 2014) → 10 (March 2017)

Does iOS Support Java?

- **No.**
  - iOS dose not support Java applications of any kind.
  - iOS *does* support JavaScript through WebKit
    - Frameworks based on HTML+JavaScript, e.g., Apache Cordova, Sencha Touch
    - Limited to the Web view.
    - Limited access to the native API
- Java is the main language used in Android development
- C# is the main language for Windows Mobile

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What's Next?

- Let's learn a little history about mobile computing and iOS
- Let's build our first iOS app!




Xcode 9 iOS 11 watchOS 4 tvOS 11

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