

CSC 471 / 371
Mobile Application
Development for iOS



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CSC 471 Mobile Application
Development for iOS



- Winter Quarter AY 2021-21
- On-Line Learning (D2L)
 - <http://d2l.depaul.edu/>
- Course Home Page
 - <http://venus.cs.depaul.edu/csc471>
- Synchronous discussion sessions:
 - Monday 5:45 – 7:15 pm
 - Zoom

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Instructor



- Prof. Xiaoping Jia
- Office Hours:
 - Monday 4:00 - 5:30pm
 - Via Zoom
- E-mail: xjia@cdm.depaul.edu
- Home Page: <http://venus.cs.depaul.edu/xjia>

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Online Learning in Winter 2021



- All course materials, assignments, and quizzes in D2L.
- Weekly video lectures. Watch ASAP
- Weekly Zoom discussions
 - Monday, 5:45-7:15pm. All are welcome
 - Recorded for those who can't
- Watch the lecture videos before the discussion sessions each week.

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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

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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>

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Other References

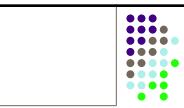
- *The Swift Programming Language (Swift 5)*.

Apple Inc., eBook: available in iTune

<https://itunes.apple.com/>

On-line:

https://developer.apple.com/library/mac/documentation/Swift/Conceptual/Swift_Programming_Language/



Swift



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System Requirements

- You need

- A Mac computer
- Mac OS X 10.15.4 or later
 - Catalina or Big Sur

- 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 12*



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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



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Apple Developer Program

- DePaul has an 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://developer.apple.com/ios/>
- Starting Xcode 7, you can test on devices without joining a developer program
 - *Personal Team*, some limitations apply

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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



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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%

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Grading – Programming Assignments

- 70% - Programming Assignments
 - Weekly *individual* assignments
 - Must use Xcode 12 and Swift 5.3
 - 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.

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Grading – Final Project

- 15% - Final Project (due week 11, March 16, 2021)
 - To develop an app of your own
 - Individual or small team project
 - Must use Xcode 12 and Swift 5.3
 - Project proposal (10%, due week 7, February 16, 2021)
 - 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

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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 9, 2021 (week 10)

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Discussion Forum

- Use D2L Discussion Forum for questions related to the topics and materials covered in the lecture.
- Students are encouraged to respond to questions
- I will monitor and respond to questions

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Why Are We Here?

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



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The Language – Swift

- We will be using Swift 5.3
 - 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



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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 (Dec 2020)
 - Swift: ∞ (Jun 2014) → 10 (March 2017) → 13 (Dec 2020)

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Does iOS Support Java?

- No.
 - iOS does 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!



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