Syllabus
CSC 491/391 Mobile Application Development for iOS II

School of Computing
DePaul University

Spring Quarter AY 2020-21 (March 29, 2021 – June 11, 2021)
First day of class: Monday March 29, 2021
Synchronous Session: Monday 5:45 -- 7:00 pm, via Zoom
On-Line Learning: http://d2l.depaul.edu/
Course Home Page: http://venus.cs.depaul.edu/csc491

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

Important Note for Spring Quarter AY 2020-21

Due to Covid-19 pandemic, this class will be delivered fully online. All course materials and assignments will be in D2L. This class will be delivered in a "flipped" format. Students are expected to watch the lecture videos before participating in the discussion sessions each week.

- Weekly lecture videos will be available in D2L before each Monday. Watch the videos as soon as you can.
- Weekly online discussion sessions will be held in Zoom meetings each Monday, 5:45-7:15pm. Links to the Zoom meetings will be in D2L. All students are welcome to attend. The discussion sessions will be recorded, and the videos will be available in D2L for students who are unable to attend.
- **It is important to watch the intro video before March 29, 2021 or join the first Zoom meeting at 5:45pm on March 29, 2021.**

Course Description

This course will cover advanced topics in mobile application development for iOS.

Tentative topics include: advanced features of Swift programming language, including error handling, protocols based programming, extensions, closures and functional programming, and system libraries. SwiftUI. Memory management in iOS and the *Automated Reference Counting* (ARC). Multi-threading and *Grand Central Dispatch* (GCD). Background processing and performance optimization. Motion sensors. Location and maps. Audio, video, and speech recognition.

Prerequisites

CSC 471 or CSC 371 Mobile Application Development for iOS I

Textbooks

None

Supplemental readings:

- *Apple's iOS Developer website*
  - *SDK, Lectures, Papers, Example code,* http://developer.apple.com/devcenter/ios/index.action

Other Requirements

- This class will target iOS 14 and Swift 5.3, which requires Xcode 12. The minimum system requirement for Xcode 12 is an Intel-based Mac running MacOS Catalina 10.15.4 or later.

- You need to have access to a Mac running MacOS Catalina or Big Sur to complete the assignments and projects of this class.

- It is recommended that you have an iOS devices (iPhone, iPod, iPad) for this class. You will be able to complete most of the assignments using the iOS simulator. However, some features are not available on the iOS simulator. If you want to use multi-touch gestures or motion sensors (accelerometer and gyroscope) you will need an iOS device.

Tentative Topics

- Advanced features of Swift programming language, e.g.,
  - Error handling
  - Protocols based programming
  - Extensions
  - Closures and functional programming
  - System libraries
- SwiftUI
- Memory management in iOS and the *Automated Reference Counting* (ARC).
- Multi-threading and *Grand Central Dispatch* (GCD).
- Background processing and performance optimization.
- Motion sensors, e.g., accelerometers, gyroscopes, magnetometers.
- Location and maps.
- Audio, video, and speech recognition.
- Design patterns and architecture

Term-Length Research Paper and Project

- Objectives
  - Identify an interesting problem involving mobile devices
  - Research iOS based technologies for potential solutions
  - Design a solution using iOS based technologies
    - Technically sound and practical to implement
    - Feasible in time and resources available
    - Involve interesting technical solutions and/or research problems
    - Possibly, original solutions, findings, insights
- Individual or a team of two
- Tentative timeline

- Project idea brainstorming, week 3
- Preliminary research presentation, week 5
- Research and project design presentation, by week 9
- Final project deliverables due, week 11

Grading

- 70% - Weekly (individual) programming assignments
  - Assignments will be posted before Monday lecture time and usually due on 11:59pm the following Tuesday. (There will be a 6-hour grace period, during which the late penalty will be waived.)
  - Start early and finish early!
  - All submissions are through the Dropbox in D2L.
  - Estimated number of assignments 5-6.
- 30% - Term-length research paper & project
  - Project idea, week 3, April 12, 2021
  - Preliminary research presentation, week 5, April 26, 2021
  - Research and project design presentation, by week 9, May 24, 2021
  - Final project deliverables due, week 11, June 7, 2021
    - Research paper
    - Project deliverables
    - Documentation
    - Demo video

- Late policy
  - Late programming assignments will be accepted with penalties
    - 10% penalty for up to 7 days
    - An additional 10% penalty for each week thereafter
  - Each student has one free pass for a one-week extension. You may only use the free pass on one assignment during the entire quarter. Use it wisely. To use the free extension pass, indicate that in the comment while you submit your assignment in D2L.
  - The last day to submit programming assignments for partial credit is May 31, 2021 (week 10)
  - No later submission will be accepted for the final project. (The free extension pass does not apply to the final project.)

- Grading scale:

A :	total >= *93*	**C+**:	*80* > total >=*77*
A-:	*93* > total >=*90*	**C** :	*77* > total >=*73*
B+:	*90* > total >=*87*	**C-**:	*73* > total >=*70*
B :	*87* > total >=*83*	**D+**:	*70* > total >=*67*
B-:	*83* > total >=*80*	**D** :	*67* > total >=*63*
		D-:	*63* > total >=*60*
		F :	total < *60*

Email

Email is the primary means of communication between faculty and students enrolled in this course outside of class time. Students should be sure their email listed under "demographic information" at http://campusconnect.depaul.edu is correct.

Academic Integrity Policy

This course will be subject to the academic integrity policy passed by faculty. More information can be found at http://academicintegrity.depaul.edu/

All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

Plagiarism

The university and school policy on plagiarism can be summarized as follows: Students in this course should be aware of the strong sanctions that can be imposed against someone guilty of plagiarism. If proven, a charge of plagiarism could result in an automatic F in the course and possible expulsion. The strongest of sanctions will be imposed on anyone who submits as his/her own work any assignment which has been prepared by someone else. If you have any questions or doubts about what plagiarism entails or how to properly acknowledge source materials be sure to consult the instructor.

Incomplete

An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final, and approved by the Dean of the College of Computing and Digital Media. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request.

Resources for Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: Student Center, LPC, Suite #370, Phone number: (773)325.1677 Fax: (773)325.3720 TTY: (773)325.7296