CIS 651 - Mobile Application Programming
Spring 2024

Course Description

This course presents topics of mobile application development for different iOS devices. It covers the following important topics: SWIFT programming language, Xcode IDE, effective user interfaces, and efficient use of persistence, database, network services, GPS, maps and sensors. We will also introduce and teach cross-platform programming technologies such as Flutter (Programming language Dart and Visdual Studio Code IDE) and Progressive Web Applications programming (PWA). After taking this class, students should have a high-level understanding of both native and cross-platform mobile application development and be able to develop useful and professional-looking iOS apps with two of the above technologies.

CIS 651 fosters two Shared Competencies, Syracuse University's university-wide learning goals for graduate students, Scientific Inquiry and Research Skills and Critical and Creative Problem Solving Skills.

Class Information

Lectures:	M/W 5:15 PM – 6:35 PM
Lecture Format:	In-Person
Help Sessions:	TBA
Classroom:	Life Science 105
Web page:	blackboard.syr.edu

Instructor: Hong Martel, Ph.D.
Email: hmartel@syr.edu
Office Hours: Mon/Wed 6:35 PM – 7:35 PM after class at Life Science 105 (or CST 0-124/125), and by appointment

Teaching Assistant: Prasad Sunil Bankar
Email: psbankar@syr.edu
Office Hours: Wed 6:35 PM – 7:35 PM after class at Life Science 105 (or CST 0-124/125)
Tuesday 12:00 to 1:00 PM at Room 0-124 CST

Teaching Assistant: Preet Karia
Email: pkaria@syr.edu
Office Hours: Monday 6:35 PM – 7:35 PM after class at Life Science 105 (or CST 0-124/125)
Friday 11:30 to 12:30 PM at Room 0-124 CST

Textbooks and Readings

There is no required textbook. Study materials will be made available via lecture slides, demo projects, documents and online links delivered to blackboard and Kaltura.

Prerequisites

The student should have mastered a high-level object-oriented programming language such as Java, Kotlin or C++, and data structure. In addition, the student should be capable of mastering a new computer language quickly (Swift and Dart in this case) and is comfortable with programing and debugging in an integrated development environment (IDE).

Course Objectives

The main objective of this course is to provide students with the tools and knowledge necessary to create mobile applications on Apple's iOS target platforms with Swift programming language in Xcode IDE. The cross-platform mobile programming will also be introduced and taught, mainly through a technology named Flutter, but as well as with Progressive Web Application (PWA). After taking the course, students will be familiar with the languages, the iOS SDK, and Apple developer tools and the cross-platform programming technologies, and will be able to design and develop professional level iOS applications with the above technologies. More advanced contents will be added according to the background and aptitude of the enrolled students.

Mobile development is one of the fastest changing fields in technology. Due to the time limitation, we won't be able to cover everything about iOS and mobile application. In a few years, what you have learned from this class may be obsolete, and new features will become available. Therefore, I hope the methods you learn from this class will lay a solid foundation, and enable you to quickly adapt to new technologies in mobile application, and in software development in general.

Attendance

Attendance in lecture is expected. It is the student's responsibility to obtain missed materials in the event of absence. A missed exam/exercise will result in a score of zero for that exam or exercise.

Outcome Measurement

Your final grade will be based on the following:

Question of the Day (25 x4)	15
5 Assignments (5x6)	30
Mid-term exam	15
Final Project Idea	5
Final Project Design/Presentation	10
Final Project Progress Report	Pass/Fail
Final Project Demo & Final Report	25
Total	100

Question of the Day

- Your Question of the Day (QOD) will be done through the blackboard **in class**. Passcode for QOD will be given in the class. Please don't share this code with your classmate who is outside of the class; doing so constitutes a violation of the Academic Integrity.
- You get 0 point when not present at the time of the QOD.
- You will get 3 points by default when you answer a QOD. 1 additional point will be awarded for a correct answer.
- Understand that some students have certain legitimate reasons to miss a class. Up to 2 missed QOD can be made up outside class in these cases.

5 Assignments

- There are 5 assignments in total.
- All Assignments are individual works and will be announced on a regular schedule.
- You need to submit assignment demo video, and the project files in zipped format.
- Each assignment will be 6 points of your final grade.

Midterm Exam

- There will be one midterm exam on contents covered the 1st half of the semester.

Note: Please don't post lecture slides, exams, demo projects and your completed assignments online, such as on Github.

I intend to use academic work that you complete this semester for educational purposes in this course during this semester. Your registration and continued enrollment constitute your permission.

I intend to use academic work that you complete this semester in subsequent semesters for educational purposes. Before using your work for that purpose, I will either get your written permission or render the work anonymous by removing identifying material.

Deadlines and Late Policies

- Deadlines are stated in each assignment. All assignments must be turned in to blackboard electronically before the deadline. There will be a deduction of 5% per day (every day) for late submission. Your grade will be zero if later than a week.
- Students are responsible to contact the instructor/TA ASAP if they are unable to meet the deadline(s) due to university acceptable reasons (ahead of time if possible and no later than a week of its happening).

Getting Help

Your instructor and TA will hold regular office hours, provide email help, and will make appointments with students having class conflicts with scheduled office hours.

Learning Goals

What you will learn in this course:

- Build cool, sophisticated apps (that can be distributed through App Store)
- Master two programming languages: SWIFT and Dart
- Application of many fundamental design models: MVC, Delegate, Singleton…
- Many computer science concepts used in mobile programming: Graphics, Animation, Networking and Multithreading et al
- Basic software development cycle and practice via a realistic final project

Key to Success

There are a few things you can do to be successful in this course:

- Make sure you satisfy the prerequisite of the course.
- Read the assigned reading material BEFORE lecture.
- Attend lecture, pay attention, do in-class exercise and ask questions.
- Be engaged in the classroom, with the instructor and fellow students.
- Do the corresponding assignments on time and do not wait for the last moment!
- If you still need help, contact your instructor/TA as soon as possible to not get behind!

Final Project App Ideas

In terms of project ideas, you are encouraged to come up with your own ideas. However, if your app is too simple, you are not going to get a high grade, even if it is perfect and can make millions of dollars. Just use figure skating as an analogy: you can finish a flawless and beautiful routine, but still receive low score, because the difficulty of your routine is low. Therefore, choose an app idea that has a reasonable difficulty level.

Milestones

There are three major milestones for the final project, each is assigned a grade.

- **App Idea:** You should first come up with an idea for your app. You are welcome to discuss your ideas with the instructor or TA for input.
- **Proposal:** You should submit a design to describe how your apps will be designed. You should strictly follow the MVC (ModelView-Controller) model in your design. In your document, you should clearly describe the design of each element: model, view, and controller. For the view part (i.e., the UI), you need to use tools to draw the prototypes of your app's user interfaces including navigation.
- **Progress Report:** at designated time, you should show that you've made adequate (~30%) progress in the implantation of your final project
- **Final Submission and Demonstration:** see the below.

Final Presentation & Submission

Each student will be given about 15 minutes to present and demonstrate his/her app. Your grade will be based on this demo, implementation and final report. All students need to submit their final report, project source code, and demo video before their presentation to the blackboard.

Bonus Opportunity

The College of Engineering and Computer Science is hosting a major Open House for high school juniors and seniors on Saturday, April 13, 2024. We would like to have current students demonstrating CS projects that day. The time frame will be 12:30 to 2:30 p.m. and lunch will be included. We will provide a form that you will use to sign up to participate. Contact Jonathan Hoster in the ECS Admissions Office at jjhoster@syr.edu with any questions.

Grading Table

Undergrad: A numeric grade of at least...	Graduate: A numeric grade of at least...	Guarantees a letter grade of at least...	Grade points per credit
95	95.625	A	4.0
90	91.25	A-	3.66
85	86.875	B+	3.33
80	82.5	B	3.0
75	78.125	B-	2.66
70	73.75	C+	2.33
65	69.375	C	2.0
60	65	C-	1.66
50	N/A	D	1.0
0	0	F	0

Communication

Use official university email address and put **CIS651-Spring2024** in the subject line for all email communications with the instructor and teaching assistants.

Blackboard/Zoom/Kaltura

Blackboard, and occasionally Zoom and Kaltura will be used to deliver lectures, lecture notes, presentations, assignments, exams and project information, any corrections or clarifications about assignments, and any changes to exam times or locations. Students are strongly advised to check the blackboard for announcements and updates regularly. It is your responsibility to follow the announcements on Blackboard. The Blackboard site is

http://blackboard.syracuse.edu

Academic Integrity:

Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy holds students accountable for upholding course-specific, as well as university-wide, academic integrity expectations for all work they submit. The policy governs citation and use of sources, the integrity of work submitted in exams and assignments, and truthfulness in all academic matters, including course attendance and participation. The policy states that any work a student submits for a course must be solely their own unless the instructor explicitly allows collaboration or editing. The policy also requires students to acknowledge their use of other people's language. These expectations extend to the realm of artificial intelligence (AI) as well as to the use of websites that charge fees or require uploading of course materials to obtain exam solutions or assignments. Students are required to ask their instructors whether use of these tools is permitted—and, if so, to what extent—before using them to complete any assignment or exam. Students are also required to seek advance permission from instructors if they wish to submit any portion of the same work in more than one course. Failure to receive this permission in advance may violate the Academic Integrity Policy.

Please consult the full policy for additional information about academic integrity guidelines and processes. All students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice.

Accommodations:

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability accommodations or register with CDR, please visit Center for Disability Resources (https://disabilityservices.syr.edu/). Please call (315) 443-4498 or email disabilityresources@syr.edu for more detailed information.

Faith Tradition Observances:

Syracuse University's Religious Observances Policy (https://policies.syr.edu/policies/university-governance-ethics-integrity-and-legal-compliance/religious-observances-policy/) recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their traditions. Under the policy, students are given an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance, provided they notify their instructors no later than the academic drop deadline. For observances occurring before the drop deadline, notification is required at least two

academic days in advance. Students may enter their observances in MySlide under Student Services/Enrollment/My Religious Observances/Add a Notification.