

Mobile Application Development

ATLS 4120/5120 Fall 2016

Class:

TR 11:00-12:50
ATLS 104

Instructor:

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Office:

ATLS 225E/231B
Tues 2-3, Thurs 1:30-2:30 or by appt

Course Description

Apple transformed the technology industry with their release of the iPhone in 2007 and the iPad in 2010, revolutionizing the mobile market. In 2008 the first smartphone running the Android operating system was released and by 2010 Google led the market in number of devices sold worldwide. Since the birth of the smartphone market developers have created over four million apps for the iOS and Android platforms.

In Mobile Application Development students will join the growing app developer community. Students will become proficient app designers and developers on the iOS and Android platforms. Classes will feature a combination of lectures, demonstrations, guest speakers and open lab sessions. Students will complete projects geared towards gaining mastery in designing and developing apps. Selected research, tutorials, and related readings will contribute to class discussions and projects.

Objectives

At the end of this course, students will have the knowledge and experience needed to create mobile apps. Students will gain these skills by meeting the following objectives:

- Mastery of the iOS and Android platforms
- Ability to create iPhone/iPad and Android apps
- Proficiency in object-oriented programming
- Understanding of Swift and Java
- Proficiency in mobile interaction design principles

Pre-requisites

ATLS-3000 Code, CSCI-1300 Computer Science 1, or an equivalent course is a required prerequisite.

Knowledge of basic programming concepts is necessary for this course. For students that have not taken either course listed above, please come speak with me.

Required Texts

Beginning iPhone Development with Swift 2: Exploring the iOS SDK by Dave Mark, Jack Nutting, Kim Topley, Jeff LaMarche, and Fredrik Olsson. Apress, 2015. Available at the CU bookstore or online for purchase and the ebook is available to download through the CU library and at <http://it-ebooks.info/book/6816/>

The Swift Programming Language(Swift 2.2) available in Apple's Developer Library
<https://developer.apple.com/swift/resources> Swift Programmer Series in the iBooks Store for free.

Beginning Android by Grant Allen. Apress 2015, 5th edition. Available at the CU bookstore or online for purchase and the ebook is available to download through the CU library and at <http://it-ebooks.info/book/1463564917/>

Required Materials

iOS development: Intel-based Mac running El Capitan OSX 10.11 or later. Sorry but a PC running Windows cannot be used for iOS development. Development cannot be done on the iPad.

Android development: Windows 7/8/10 with JDK 8, Mac OSX 10.8.5 or later with JDK 6, Linux GNOME or KDE desktop with JDK 8. More details/options <http://developer.android.com/sdk/index.html#Requirements>

We will be remaining on Xcode 7.3 and Android Studio 2.1 all semester. Please DON'T upgrade as your projects might not be backwards compatible and therefore I might not be able to grade your work.

Xcode and Android Studio are on all lab Macs in the ATLAS building for your use. Additionally, Xcode is on the Macs in Norlin as well. If you are using a lab Mac you will need a portable storage device such as a USB Jump Drive to save your apps. The workspace on the lab Macs may be wiped at any time during the semester. Lost and/or corrupted work is not an acceptable excuse for late work.

Class Resources

All class information is available on the class web site at <http://creative.colorado.edu/~apierce/mad> This includes the class schedule, assignments, and resources. It is your responsibility to check the site regularly to keep up with the class and complete all assignments. All class examples are available on github at https://github.com/CUATLAS/Fall16_MAD

Workload

This course is very technical and challenging and requires a great deal of time and commitment. Students should plan on spending 2-3 hours of outside class time for every hour in class. For this class, that translates to 8-12 hours per week of work outside of class. I welcome any students that are concerned about the time commitment or find themselves struggling to please talk to me personally.

Attendance

This is a fast-paced course with new topics covered every class and each new concept building on top of previous ones. Attendance and class participation are important components of the course. You are encouraged to ask relevant questions, share your thoughts, and work with fellow students. You are expected to spend all class time working on class-related projects. Class time should not be used for any other classes or activities.

As unavoidable circumstances might occur, 3 absences are allowed during the semester. Every additional class missed causes a 10% reduction in a student's final grade. Extreme lateness counts as 1/3 of an absence. You are responsible for all material and announcements made in class. Do not expect me to catch you up for classes you've missed -- that's your responsibility. Critique days are required; an absence that day will impact your grade for that project.

In extreme situations such as major illnesses, death in the family (or close friends), religious observances (see below), or school related absences, please talk or email me **before** your absence.

Grading

Grades will be posted on Desire2Learn at <https://learn.colorado.edu/d2l/home/180901>

Grading in this course is based on the following components:

- Projects 45%
- Quizzes 10%
- Labs 25%
- Midterm Practicum: 10%
- Final Practicum: 10%

Grading Criteria

The grading standard used in ATLAS courses is as follows:

- A: excellent work – far beyond minimal requirements
- B: above average work – went beyond minimal requirements
- C: average/competent work – met minimal requirements
- D: below average work – did not meet minimal requirements
- F: unsatisfactory work

Grading Rubric

Labs are graded based on their completeness (meets the assignment's requirements), timeliness (turned in on time), and technical proficiency (works correctly).

Projects are graded based on their concept, creativity/design, and technical sophistication.

Note: I do not give out A's easily. If you turn in all your work on time (and if it is satisfactorily completed), and if you attend class and participate, you are ensured a C. A's and B's are reserved for students who excel beyond average and competent work. I take your grades very seriously and will do the best that I can to give you a fair and accurate grade. I know many students believe they deserve an A for the course if they do the minimally accepted work, but I don't.

Late work

All assignments are due on Github.com at the start of class on their due date. Please make sure your assignments are clearly labeled so they are easy for me to identify. Late projects will be penalized 10% per 24-hour period that it's late.

In case of an emergency, students must notify me if you will miss an assignment deadline **before** the due date to discuss special arrangements.

Lab Procedures

Please abide by our lab policies to keep our labs in good shape.

- No food is allowed inside the labs.
- No drinks are allowed inside the labs.
- Please treat all equipment with care and respect.
- If you see someone abusing the equipment, let an instructor know.
- If you see someone removing or tampering with any of the equipment let an instructor know.
- Do not prop open the doors. The labs are secured through BuffOne card access and propping open the doors creates a security risk.

Computing Devices Policy

Laptops and mobile computing devices can be a great asset to learning, but they can also be a source of distraction and actually impair the learning environment. Within ATLAS courses, laptops and mobile computing devices should only be used for class related activities. Students should not email, text, message, check social media, play games, surf the web, or work on assignments or projects for other courses during class. If you are using your own Mac, please disable and sign out of iMessage during class. Additionally, the use of cell phones or other devices is prohibited during class. If you are found to be engaging in these activities during course time, Instructors reserve the right to ask you to leave the classroom. If you have an emergency situation that requires access to your cell phone please come talk to me before class starts.

Code Plagiarism

I encourage students to work together on assignments, but I expect the work turned in to be each student's own. So work together, talk, brainstorm, trouble shoot, but make sure that the assignments you turn in were created by you.

The web is a great resource, and searching for help, answers, and inspiration is very useful, so take advantage of it. You can adapt ideas and concepts you find online to be part of your projects, but your projects must be written entirely by you, and you should be able to explain all of the code you use in a project. If your project uses code snippets found from other sources they should not exceed 20% of your project's code and you should be able to explain how that code works. Turning in a project that doesn't meet this guideline will result in an F. If you are using code snippets, or coding concepts, from other sources you must cite the sources in the comments section. Copying programs directly out of a book, web site, or from another person without properly citing them is considered plagiarism and will be dealt with in accordance with the CU Honor Code (see below). Please check with me if you are unclear on the line between adaptation and plagiarism. Also, reusing projects from another class or commercial work is not acceptable for projects in this course unless you get previous approval from me.

Intellectual Honesty

All work is assumed to be your own and produced exclusively for this course. Work done for one course, even if revised, is not to be submitted in another without the instructor's prior approval. Borrowing of ideas or language from other sources (including published material, other student papers, the Internet or other electronic resources, etc.) must be carefully documented. Cases of suspected plagiarism will be referred to the University, and the student if convicted will receive a grade of F in the course in addition to sanctions assigned by the University. Carelessness in documenting sources, even if not

technically plagiarism, will be penalized as I deem appropriate. If you are uncertain about how or whether to document sources, please consult me.

Policies

Religious Observances

Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please contact me **before** class regarding any absences or conflicts due to religious observances. See full details at http://www.colorado.edu/policies/fac_relig.html

Disability Services

If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu. If you have a temporary medical condition or injury, see Temporary Injuries guidelines under the Quick Links at the Disability Services website (<http://disabilityservices.colorado.edu/>) and discuss your needs with your professor.

Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy of the institution <http://www.colorado.edu/policies/academic-integrity-policy>. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at honorcode.colorado.edu.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the OIEC website <http://www.colorado.edu/institutionalequity/>.

Behavioral Standards

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at <http://www.colorado.edu/policies/classbehavior.html> and http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

By enrolling, and remaining enrolled in this class, you signify your awareness and understanding of the policies contained within this syllabus and your agreement to conduct yourself in accordance with these policies.

Topical Outline

We will be exploring mobile app design and development including the various technologies and concepts needed to build iOS and Android applications. These include, but are not limited to:

- Intro to the Mobile platform
- Social and cultural effects of mobile and app-based computing
- Object Oriented Programming
- The Model View Controller architectural pattern
- iOS development and Xcode
- The Swift programming language
- Frameworks/APIs
- Gestures
- Android development and Android Studio
- XML
- Java for Android development
- User Interface Design
- Application lifecycle
- Mobile Interaction Design
- App distribution