CS 235AM, Mobile Application Development: Android
Winter 2018

Sections	CRN 33367 on campus, CRN 33368 online	**Credits**	4
Classroom	Building 19, room 132	**Day & Time**	M, W 12:00–11:50

Instructor	Brian Bird	**Office**	Building 19, Room 152
Office Phone	541–463–3024	**Office Hours**	M, W 2:00 – 3:00
E-mail	birdb@lanecc.edu	**Lab Hours**	Tu, Th 2:30 – 4:30

Course Description

This course introduces students to applying object oriented programming to mobile application development using the Android SDK (System Devlopment Kit). Cross-platform mobile app developpment will be done using the Xamarin framework and Visual Studio.

Learning Outcome

Design the core logic for a mobile software application. Write, debug, and test the code for the core logic for an application. Design User that interoperate with the core logic. Evaluate mobile app designs and architectures in terms of UX (User eXperience), performance, and maintainability.

Time Commitment

Since this is a 4-credit class, you will need to spend 4 hours a week in class or engaging with content online and 8 hours a week studying, taking quizzes, writing code and doing code reviews. This comes to a total of 12 hours a week for the typical student.

Course Content

Technologies

C#	Visual Studio	Mono (.NET) framework
Android APIs	AXML (Android declarative UI)	SQLite
Android Emulators	Android SDK	UI Controls & Widgets

Concepts

Cross platform development	Android Activity lifecycle	Cross platform architecture
Mobile UI design	Separation of concerns	Android application architecture
Android Services	Using device resources	Native apps vs. Web apps

Skills

Use Visual Studio to write, compile and run C# Android applications.
Test and debug Android applications using the Android emulator and on Android devices.
Design and create Android UIs using AXML and the Xamarin Studio UI designer.
Design and create apps that consume web services
Use Android device resources such as the file system, database and GPS in your apps
Read and write data using SQLite in your apps

Learning Resources

Texts
There is no textbook required for this class. We will be using resources provided on the Xamarin Web site.

Optional textbooks:

Murach, Joel, Murach's Android Programming (2nd Ed). 2015. Murach. ISBN 978-1-890774-93-6
Reynolds, Mark. *Xamarin Mobile Application Development for Android*. 2014. Packt.

Course Web Site
http://classes.lanecc.edu is the address for the LCC Moodle site. Course learning materials and activities will be managed through the course Moodle page.

Computers and Tablets
Computers with Visual Studio, and an Android Emulator are provided in the classroom. There are also Google Nexus 7 Android tablets available for student use in the classroom. Students may also bring their own computers and Android phones or tablets for use in class.

Computers with the software required for the course are also available to all students in the CIT Main Lab in building 19, room 135.

You may install all the software needed for this course on your own computer. On a Windows PC, you must have Windows 7, 8.1 or 10. On a Mac you need at least OS-X 10.10 (Yosemite). Unfortunately, there is no Visual Studio Android development environment available for Linux.

Software and licenses

Visual Studio Community Edition (free) or Visual Studio Professional (or higher) is the IDE we will use. It is available for both Mac OS and Windows. The professional edition is available to CIT students. It can be obtained by downloading it from LCC's Microsoft Imagine Premium web site. Microsoft also provides an Android Emulator for Visual Studio which is faster and easier to use than the emulator in the Android SDK. It requires Windows 10.

The Xamarin.Android license is free for individuals and small teams.

Learning Activities

Lab Assignments

These are programing projects that you will do on your own- either using the computers and software in the CIT lab, or using your own computer and software. Students will submit both a *beta* version and a *release* version of the software solution for each lab assignment. The *beta* version should be essentially complete. "Complete" means having working code that fulfill all the core requirements for the assignment, but it does not need to be bug free. The *release* version should fulfill all requirements and be bug fee.

Code Reviews

Students will be paired with a code review partner. The partners will evaluate each-other's coding practices as well as the functionality of each software solution. Students will use input from the code review to revise their code prior to submitting the *release* version of their software solution.

Quizzes

Weekly quizzes are given over the reading and exercises in the textbook as a way to focus students on the most important concepts in textbook chapters covered.

Term Project

The requirements for the term project will be posted on Moodle.

Weekly Learning Activities

- *Monday by midnight*
  - *Review your lab partner's code*
  - *Start this week's reading*
  - *Start this week's lab project*
- *Wednesday by midnight*
  - *Take the reading quiz*
- *Saturday by midnight*
  - *Post a beta version of this week's lab app for your lab partner to review*
  - *Submit the release version of last week's lab app*

Example: Activities and deadlines for the first two weeks

Week	Sun	Mon	Tu	Wed	Th	Fri	Sat.
1		Start week 1 reading Start lab 1		Reading quiz due			Lab 1 beta due
2		Lab 1 code review due Start week 2 reading Start Lab 2		Reading quiz due			Lab 1 release due Lab 2 beta due

Assessment and Grading

Specific grading criteria will be applied to each of the labs, quizzes, and exams you will be working on in this class.

The table below summarizes the percentage of your total grade given for each assessment task:

Learning & Assessment Activities	Number	% each	Total %
Labs	8	5%	40%
Code Reviews	8	1%	8%
Quizzes	8	1%	8%
Midterm and final exams	2	12%	24%
Term Project	1	20%	20%

Letter grades for the course will be determined by the following percentages:

Letter	-		+
A	90 - 91	92 – 97	98 - 100
B	80 - 81	82 – 87	88 - 89
C	70 – 71	72 – 77	78 - 79
D	60 - 61	62 – 67	68 - 69
F	Below 60		

Late Work

- Grades for code reviews will be reduced by 25% if either the beta version or code review are submitted late.
- Grades for lab release versions submitted after the due date will be reduced by 10%
    - Late labs 1 – 3 will only be accepted before the midterm exam.
    - Late labs 4 – 8 will only be accepted before the final exam.
- Quizzes and exams cannot be taken after the due date. Plan ahead! Exceptions will only be made for illness or emergency situations.

Academic Honesty

While students are encouraged to discuss labs and to use each other as resources, each student is responsible for his/her own work. In other words you can help each other, but you can't copy any part of someone else's work. The end product must be each student's own individual work.

Attendance

Attendance is not graded, but to succeed, you must:

- Engage in the lectures in person or via live or recorded video
- Participate in class activities either online or in the classroom

No Show Drop

The college's "no show, drop" policy requires that: during the first week, on-campus students must physically attend at least one class session. Online students must complete at least one activity (a quiz or assignment) otherwise the student will be dropped from the class.

Academic Calendar for Winter Term 2018

Term begins	1/8/18
Last day to receive refund	1/14/18
Martin Luther King Jr. holiday – college closed	1/15/18
Presidents Day holiday – college closed	2/19/18
Last day for schedule changes	3/2/18
Finals week	3/19/18 – 3/24/18

Accessibility and Accommodations

To request accommodations contact the Center for Accessible Resources at (541) 463-5150 or AccessibleResources@lanecc.edu

Please be aware that any accessible tables and chairs in this room should remain available for authorized students who find that standard classroom seating is not usable.

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Table 1: Tentative Schedule

Week	Topics	Reading	Assignments Due
1 1/7 – 1/13	Intro to the Xamarin mobile platform. Android application development. Android project resources.	Intro to Mobile Development Setting up the Developer Tools Intro to Android Development Android Resources	Reading quiz 1 Lab 1: Hello Android – Beta • Group A: Reset button • Group B: Extra label and button
2 1/14 – 1/20 No class on Monday, MLK Day	Multi-screen applications and Intent objects	Multiscreen Apps	Reading quiz 2 Lab 2: Multi-screen apps – beta version • Group A: 99 bugs • Group B: Let's Make a deal Lab 1 Code review and release version
3 1/21 – 1/27	Activity life-cycle Saving and restoring Activity state	Activity Lifecycle	Reading quiz 3 Lab 3: layout and orientation app – beta version • Group A: Awesome Quotes • Group B: Who Said It? (Quiz app) Lab 2 Code review and release version
4 1/28 – 2/3	UI Layouts and Orientation	User Interface (Section on Layouts)	Lab 4: Fragments app – beta version • Group A: Pig with 8-sided die • Group B: Pig with 6-sided die Lab 3 Code review and release version
5 2/4 – 2/10	UI Fragments	Fragments ActionBar UI Element ?	Start term project Reading quiz 5 Lab 5: Fragments app – beta version • Group A: Pig with 8-sided die • Group B: Pig with 6-sided die Lab 4 Code review and release version

6 2/11 – 2/17	Midterm	Covers weeks 1 – 5	Midterm Reading quiz 6 Lab 6: ListView app – beta version • Tide prediction app using pre-written web service code Lab 5 Code review and release version
	Displaying data in lists	ListViews and Adapters Intro to Web Services	
7 2/18 – 2/24 No class on Monday, Pres Day	Data access with SQLite	Managing SQLite Data	Reading quiz 7 Lab 7: SQLite Database – beta version • Tide prediction app Lab 6 Code review and release version
8 2/25 – 3/3	Geolocation	Maps and Location	Reading quiz 8 Lab 8: Geolocation – beta version • Tide prediction app Lab 7 Code review and release version
9 3/4 – 3/10	Publishing an App		Reading quiz 9 Lab 9: Publishing to an App Store • Practice publishing Lab 8 Code review and release version Term project beta version
10 3/11 – 3/17	Work on term projects Present term projects		Lab 9 Code review and release version Term project code review and release version Publish term project to an App Store
11 3/18 – 3/21	Final Exam		