Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Mobile Application Development
Course Code:	COMP 304
Course Hours/Credits:	56
Prerequisites:	COMP 228
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	ILIA NIKA
Creation Date:	Fall 2005
Revised by:	ILIA NIKA
Revision Date:	Fall 2020
Current Semester:	Winter 2022
Approved by:	ppesikan c/o

Chairperson/Dean

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Acknowledgement of Traditional Lands

Centennial is proud to be a part of a rich history of education in this province and in this city. We acknowledge that we are on the treaty lands and territory of the Mississaugas of the Credit First Nation and pay tribute to their legacy and the legacy of all First Peoples of Canada, as we strengthen ties with the communities we serve and build the future through learning and through our graduates. Today the traditional meeting place of Toronto is still home to many Indigenous People from across Turtle Island and we are grateful to have the opportunity to work in the communities that have grown in the treaty lands of the Mississaugas. We acknowledge that we are all treaty people and accept our responsibility to honor all our relations.

Course Description

In Mobile Application Development, students will gain hands-on experience in developing and deploying mobile applications on the Android platform. Coursework emphasizes how to create advanced Graphical User Interfaces (GUIs), handle events, access remote services, store and retrieve data on the device, display maps, and use other Android APIs. Android Studio will be used to create a variety of mobile applications.

Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/. For apprenticeship-based programs, visit http://www.collegeoftrades.ca/training-standards.

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Distinguish various mobile application development technologies and explain Android platform and development environment.
2. Design, code, and test Android applications using high-level user interface elements.
3. Design, code, and test Android applications that incorporate Graphics and Animations.
4. Use Structured Data Storage APIs to store data in a local database or a NoSQL cloud-hosted database.
5. Design, code, and test Android Applications that connect to internet resources, perform network operations on background threads and parse the information using various parsers.
6. Design, code, and test Android Applications using Location, Maps, and Contextual Awareness APIs.
7. Design, code, and test Android Applications that send/receive broadcasts and SMS messages.
8. Use various Android APIs and best-practice patterns designed to support running background tasks and providing notifications to users.
9. Deploy Android Applications and discuss security issues.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.

**There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.*

Global Citizenship and Equity (GC&E) Outcomes

N/A

Methods of Instruction

Instructional methods in this course include pre-recorded lectures that will cover weekly topics, interactive weekly sessions, demonstrations, hands-on exercises, and lab exercises for students to complete independently.

Text and other Instructional/Learning Materials

Text Book(s):

Required Text:

Reto Meier, Ian Lake, Professional Android, 4th Edition, ISBN: 978-1-118-94952-8, Wiley & Sons, 2018.

Reference books:

DiMarzio, Jerome F., Beginning Android Programming with Android Studio, Fourth Edition, Wrox, 2016, ISBN: 978-1-118-70559-9. Available on Safari IT Books Online.

Joseph Annuzzi Jr., Lauren Darcey, Shane Conder: Introduction to Android Application Development: Android Essentials (5th Edition), Publisher: Addison-Wesley Professional; 5 edition (Dec 18 2015), ISBN-10: 013438945X, ISBN-13: 978-0134389455. Available on Safari IT Books Online.

Paul Deitel; Harvey Deitel; Alexander Wald, Android 6 for Programmers: An App-Driven Approach, Third Edition, Publisher: Prentice Hall, Pub. Date: December 11, 2015, Print ISBN-13: 978-0-13-428936-6, Print ISBN-10: 0-13-428936-6. Available on Safari IT Books Online.

Online Resource(s):

eCentennial course shell

Evaluation Scheme

- Test 1: Hands-On test covering Week 1 - 5 materials
- Test 2: Hands-On test covering Week 6-13 materials and comprehensive topics from previous weeks
- Assignment 1: Developing an Android application that includes multiple activities and fragments.

- Assignment 2: Developing an interactive Android application with standard UI elements
- Assignment 3: Developing an Android application with advanced UI, Graphics, and Animations
- Assignment 4: Developing an Android application with Data Access and remote connection capabilities.
- Assignment 5: Developing an Android application with Location and Mapping capabilities.
- Assignment 6: Developing Android applications that communicate with Android services and send SMS messages

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Test 1	1, 2, 3	1, 2, 3, 4, 5		25
Test 2	4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5		25
Assignment 1	1, 2	1, 2, 4		5
Assignment 2	1, 2	1, 2, 4, 5		8
Assignment 3	1, 2, 3	1, 2, 3, 4, 5		10
Assignment 4	2, 4, 5	1, 2, 4, 5		10
Assignment 5	2, 3, 6	1, 2, 3, 4, 5		10
Assignment 6	2, 5, 7, 8	1, 2, 4, 5		7
Total				100%

If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official Centennial College photo identification or they may be refused the right to take the test or test results will be void.

Tests or assignments conducted remotely may require the use of online proctoring technology where the student's identification is verified and their activity is monitored and/or recorded, both audibly and visually through remote access to the student's computer and web camera. Students must communicate in writing to the instructor as soon as possible and prior to the test or assignment due date if they require an alternate assessment format to explore mutually agreeable alternatives.

Student Accommodation

The Centre for Accessible Learning and Counselling Services (CALCS) (http://centennialcollege.ca/calcs) provides programs and services which empower students in meeting their wellness goals, accommodation and disability-related needs. Our team of professional psychotherapists, social workers, educators, and staff offer brief, solution-focused psychotherapy, accommodation planning, health and wellness education, group counselling, psycho-educational workshops, adaptive technology, and peer support. Walk in for your first intake session at one of our service locations (Ashtonbee Room L1-04, Morningside Room 190, Progress Room C1-03, The Story Arts Centre Room 285, Downsview Room 105) or contact us at calcs@centennialcollege.ca, 416-289-5000 ext. 3850 to learn more about accessing CALCS services.

Use of Dictionaries

- Any dictionary (hard copy or electronic) may be used in regular class work.

Program or School Policies

N/A

Course Policies

N/A

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic Honesty

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Forms of academic dishonesty include cheating, plagiarism, and impersonation, among others. Breaches of academic honesty may result in a failing grade on the assignment or course, suspension, or expulsion from the college. Students are bound to the College's AC100-11 Academic Honesty and Plagiarism policy.

To learn more, please visit the Libraries information page about Academic Integrity https://libraryguides.centennialcollege.ca/academicintegrity and review Centennial College's Academic Honesty Module: https://myappform.centennialcollege.ca/ecentennial/articulate/Centennial_College_Academic_Integrity_Module_%202/story.html

Use of Lecture/Course Materials

Materials used in Centennial College courses are subject to Intellectual Property and Copyright protection, and as such cannot be used and posted for public dissemination without prior permission from the original creator or copyright holder (e.g., student/professor/the College/or third-party source). This includes class/lecture recordings, course materials, and third-party copyright-protected materials (such as images, book chapters and articles). Copyright protections are automatic once an original work is created, and applies whether or not a copyright statement appears on the material. Students and employees are bound by College policies, including AC100-22 Intellectual Property, and SL100-02 Student Code of Conduct, and any student or employee found to be using or posting course materials or recordings for public dissemination without permission and/or inappropriately is in breach of these policies and may be sanctioned.

For more information on these and other policies, please visit www.centennialcollege.ca/about-centennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

Semester:	Winter 2022	Professor Name:	See eCentennial course shell
Section Code:	ALL	Contact Information:	See eCentennial course shell
Meeting Time & Location:	See myCentennial timetable	Delivery Method:	On-line with scheduled sessions

Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
1	Introduction to Android Platform and Android Application Development	Chapter 1, 2 Lecture ppt slides Pre-recorded Lecture	Examine Android Platform. Differentiate between leading mobile operating systems. Summarize Android Development Environment and Android Application Architecture. Write a simple Android application using Android Studio.	Pre-recorded Lecture Interactive Lab Session Demonstration Hands-On Exercises		
2	Components and Life Cycle of Android Applications Activities, Fragments, Intents	Chapter 3, 6 Lecture ppt slides Pre-recorded Lecture	Examine Android activities, fragments, intents. Summarize application, activity, and fragment life cycles. Create and use activities. Create and use fragments. Use intents to call built-in applications and pass information to other activities.	Pre-recorded Lecture Interactive Lab Session Demonstration Hands-On Exercises	Assignment 1: Developing an Android application that includes multiple activities and fragments.	Week 2
3	Managing Application Resources Introduction to Building User Interfaces	Chapter 4, 5 Lecture ppt slides Pre-recorded Lecture	Appraise Externalizing of Resources. Use Recycler View and Layout Managers. Use data binding. Use layout classes and simple UI controls in Android apps.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises		
4	Designing UI with Standard Views	Chapter 5, 13 Lecture ppt slides	Summarize Android Views.	Pre-recorded Lecture Demonstration	Assignment 2: Developing an	Week 4

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
	The Android Widget Tool	Pre-recorded Lecture	Examine and use standard user interface elements, such as TextView, EditText, Button, CheckBox, Radio Button, Menu, ListView, Spinner, Progress bars, Dialogs, in Android apps.	Interactive Lab Session Hands-On Exercises	Android application with standard UI elements.	
5	Custom Views Using Drawings and Animations in Android Apps	Chapter 5, 14 Lecture ppt slides Pre-recorded Lecture	Create Custom Views. Point out drawing and animation capabilities of Android. Write Android apps that feature various drawings and animations.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises		
6	Using Internet Resources	Chapter 7 Lecture ppt slides Pre-recorded Lecture	Connect Android apps to Internet resources. Point out problems with using Asynchronous Tasks to download and process Internet resources on background threads. Use View Models and Live Data to store and observe data Parse XML and JSON feeds.	Pre-recorded Lecture Demonstration Interactive Lab Session (practice for Test 1) Hands-On Exercises	Assignment 3: Developing an Android application with advanced UI and Graphics features.	Week 6
7- 8	Creating and Using Databases in Android Apps	Chapter 9 Lecture ppt slides Pre-recorded Lecture	Examine and use Room persistence library to add, modify, and delete saved data. Query Room databases and observe query result changes using Live Data. Create databases using the SQLite library. Add, modify, and delete data within a Firebase Database.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises	Test 1 Hands-On, covering week 1-5 topics.	Week 7
9	Content Providers in Android	Chapter 10 Lecture ppt slides Pre-recorded Lecture	Examine content providers. Write apps that share data and create their own content providers.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises	Assignment 4: Developing an Android application with Data Access and remote connection capabilities.	Week 8

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
					Students should work in pairs using the pair programming technique.	
10	Location, Contextual Awareness, and Mapping	Chapter 11 Lecture ppt slides Pre-recorded Lecture	Install and use Google Play services. Determine and update the device's physical location using the emulator. Set and monitor Geofences. Find addresses and address locations with the Geocoder. Add interactive maps to your application. Display user location on a map.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises		
11	Intents and Broadcast Receivers Messaging	Chapter 6 Lecture ppt slides Pre-recorded Lecture	Examine Intent Broadcast and Broadcast Receivers. Explore SMS Messaging API. Develop android apps that send/receive SMS messages.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises	Assignment 5: Developing an Android application with Location and Mapping capabilities. Students should work in pairs using the pair programming technique.	Week 11
12	Android Services and other APIs designed for scheduling background network operations efficiently Notifications	Chapter 11 Lecture ppt slides Pre-recorded Lecture	Summarize types of services. Create custom services by performing long-running tasks in a Service. Execute asynchronous tasks on separate threads and establish a communication between a Service and an Activity.	Pre-recorded Lecture Demonstration Interactive Lab Session Hands-On Exercises		

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
			Schedule tasks with WorkManager. Explain and use Notification Manager.			
13	Publishing Android Apps Google Play and App Business Issues	Google Android Documentation Chapter 21 Lecture ppt slides Pre-recorded Lecture	Explore Android deployment process. Prepare your application for release. Create a signing certificate and sign your release builds. Publish your app on the Google Play Store. Use Google Play to monitor application metrics, app vitals, user acquisition, and user feedback. Understand monetization and promotion strategies. Optimize your app using Firebase Analytics and Firebase Performance Monitoring.	Pre-recorded Lecture Demonstration Interactive Lab Session (practice for Test 2) Hands-On Exercises	Assignment 6: Developing an Android application that communicates with Android services and sends SMS messages. Students should work in pairs using the pair programming technique.	Week 13
14	Test 2	Week 6-12 materials	Develop Android Apps using various Android APIs.	Review test materials	Test 2 Hands-On, covering week 6-12 topics.	Week 14