Course Syllabus: CS 388 - Android Application Development

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Table of Contents

1. General Information

Course Number:	CS388
Course Title:	Android Application Development
Section:	001
Semester:	Fall 2024
Date & Time:	**001:** Tuesday/Thursday 1:00 pm - 2:20 pm
Modality:	Face-to-Face
Credits:	3
Office Hours:	**CKB Public Area/Lounge Main Floor:** Monday/Wednesday 10 am - 11:20 am General availability via Discord via a provided communication channel

2. Overview

This course is a semester-long project-based exploration into Android mobile app development. The first part of the course focuses on developing skills through coding labs and building fully functional app assignments. The second half is dedicated to applying these skills in projects to design and build an original app from scratch.

The course will cover the fundamentals of Android development including UI design, data handling, and app architecture. Students will gain hands-on experience with Android Studio and Kotlin, building applications from the ground up.

3. Course Catalog

Prerequisites: Prerequisite: CS 288 (https://catalog.njit.edu/search/?P=CS%20288) with a grade C or better. This course introduces mobile application development for the Android platform. Students will learn skills necessary for creating and deploying applications with the Android Software Development Kit (SDK). The course is designed to introduce and familiarize students with programming in the Android environment. It starts with an examination of the basic components and concepts that define the Android platform, and then moves on to cover the specific structure that comprises an Android application. An overview of the most common tools and techniques for writing Android applications is included. The Android approach to user interfaces is described along with a discussion of some of the more common user-interface elements. Storage strategies for persistent information are also covered, including the use of the available SQLite Database features. The unique characteristics of programming for a mobile environment are introduced and explained. Hands on experience in the form of exercises and programming projects are included throughout the course to reinforce material that has been presented in lecture form.

4. Instructor

Matt Toegel
Email: matthew.toegel@njit.edu
Slack: MattToegel
GitHub: MattToegel

5. Attending Class

Class will be held at scheduled times. Active participation and engagement are expected to ensure a comprehensive understanding of the topics covered. CodePath courses focus on developing student's habits and skills in order to to be successful in the tech industry. Success in industry goes beyond proficiency in technical domains; The ability to be punctual, meet project deadlines and work effectively are equally important skills. 5% will be deducted from the final grade of any student who misses more than 2 meetings without prior permission or Dean of Students approved excuse.

6. Learning Outcomes

1. Students will learn the basics of Android development using Kotlin and Android Studio.

    a. Students will develop and design interactive user interfaces.

    b. Students will handle events and manage app data effectively.

    c. Students will build and test Android applications using modern tools and frameworks.

2. Students will learn the softwore development lifecycle.

    a. Students will complete small projects during various units.

    b. Students will follow a milestone approach to create a larger scale project over the last set of units.

3. Students will utilize version control.

    a. Students will utilize github to record and submit coursework.

    b. Students will utilizes branches to separate works.

7. Policies

7.1. Academic Integrity

The work done is expected to be your own, any group work should clearly distinguish ownership of tasks. Use of snippets/material from others should be kept to a minimum and the source should be accredited where applicable.

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: academic integrity code (http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf).

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing, or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

7.2. Grading Policy

The CodePath grading as detailed below will be weighed as 60% of the final grade. Please be advised that the contribution of the CodePath grade to your final grade cannot exceed 60%, even if you get more than 100% as your CodePath grade, The remaining 40% of the final grade will be determined as follows:

- The final project will be graded and will be 25% of the final grade

- You will have to submit the weekly labs. They will be reviewed and will be 10% of the final grade. The labs need to be completed in class, and your grade will be based on your throughput. If you are absent from class for a justified reason (approved by the Dean of Students) you will be able to complete and submit the lab within 72 hours of the scheduled lab

- Stretch features of the assignments will be 5% of the final grade. In order to get the full 5% credit for stretch features you will need to complete the required features of all the assignments. If you complete at least half of the stretch features of every assignment you will 2% credit

- A bonus of 5% will be given for perfect attendance, with the exception of up to two justified absences (approved by the Dean of Students)

- The course has no final and midterm exams

7.2.1. Breakdown

CodePath	60%
Stretch Features	5%
Weekly Labs	10%
Final Project	25%

7.2.2. Bonus Points

A student can earn bonus points on an app assignment by completing extra app features ("stretch features") beyond that which is indicated as required. Bonus points will only be applied within the given coursework section they are earned and won't increase the impact of a given section beyond it's designated weight. For instance, no amount of bonus points will increase the impact of the Assignments section beyond 50% of the final grade.

7.2.3. Additional Grade Incentives

- Students receive an additional bonus on their grade if they complete all their assignments:

  - **+5%** bonus for all complete submissions (meaning they submitted something for all assignments or labs or milestones, but incurred at least 1 late submission)

  - **+10%** bonus for no late/missing/incomplete submissions

Bonuses Table

Perfect Attendance	+5%
Assignment Completion	• +5% w/ at least 1 late • or +10% for no late/missing/incomplete

7.3. Requesting Accomodations

If you are in need of accommodations due to a disability please contact the Office of Accessibility Resources & Services (OARS) (https://www.njit.edu/studentsuccess/accessibility), Fenster Hall Room 260 to discuss your specific needs. A Letter of Accommodation Eligibility from the OARS authorizing your accommodations will be required.

7.4. Resources for NJIT Students

NJIT Services for Students (https://docs.google.com/document/d/1xGO2qcVEF1tsOgZn-_W1LjSOKn_jhEVs9IWI_6jeuPs/edit?usp=sharing), including Technical Support

7.5. Class Etiquette

Students who are the most successful attend and participate in class. If you have questions, please ask them. This makes the class more dynamic and interesting for everyone.

7.6. Proctoring

NJIT policy requires that all midterm and final exams must be proctored, regardless of delivery mode, in order to increase academic integrity. Note that this does not apply to essay or authentic based assessments. Effective beginning Fall semester 2019, students registered for a fully online course section (e.g., online or Hyflex mode) must be given the option to take their exam in a completely online format, with appropriate proctoring.

8. Code Path

The material below is the CodePath description of the course and any grading information below refers to the CodePath portion of the grading.
Note: The adjustments in this syllabus take precedence over the syllabus on CodePath.

8.1. Course Description

Welcome to Intermediate Android! This course is a semester long project-based exploration into Android mobile app development.

In the first part of the course, students develop skills by completing coding labs and building four fully functional app assignment projects.

In the second half of the course students will apply their skills to design and and build an original app from the ground up. The course culminates in a Demo Day event where students will present their finished apps in a live demo.

8.2. Course Goals

At the completion of the course, students are expected to:

- Create their own **original Android apps** using ConstraintLayout, RecyclerView, and networking libraries
- Use Activities and Navigation to give their apps **multiple navigable screens**
- Use XML to **style and theme** their apps and make them user-friendly

8.3. Student Expectations
8.3.1. Prior Knowledge

Students entering the program should…

- Have completed an introductory Android development course or equivalent experience
- Be majoring in CS, Software Engineering, or related subject
- Be able to commit to attending classes and labs each unit and completing 5-7 hours of work outside class time

Through the completion of the prework (https://courses.codepath.org/snippets/and102/prework) you will also learn how to:

- Work with Android Studio to create apps and push them to Github

8.3.2. Time Commitment

Students are expected to commit **7-9 hours a unit** during the duration of the **10-unit program**.

- **2 hour** synchronous class time
- **5-7 hrs** asynchronous work time on projects

8.4. Course Structure
8.4.1. Key Activities

- **Synchronous Class Sessions:** Students will meet synchronously during each unit with your instructor.

- **Optional Office Hours:** Attend office hours led by TAs. This is a time to ask questions about projects or topics in a smaller environment.

8.4.2. Topics Schedule

- **Kotlin and Layouts**
  - Kotlin and Android Studio
  - Constructing View Layouts (LinearLayout, RelativeLayout, ConstraintLayout)
- **RecyclerView**
  - Using common views (buttons, labels, images)
  - Using RecyclerViews
- **APIs**
  - JSON
  - HTTP requests
  - Fetching and parsing data
- **Multi-screen Apps**
  - Multi-screen applications
  - Explicit vs implicit intents
  - Passing data between activities
- **Data Persistence**
  - Networking APIs
  - Shared Preferences using Room
  - Databases
- **Fragments and Navigaiton**
  - Bottom navigation menu
  - Switching between fragments

8.5. Projects

In this course you will have the opportunity to apply your understanding of the topics discussed in class and incorporate your own creativity through projects and labs.

- **Unit Projects:** You will work on a total of 6 projects from units 1-6. They should take approximately 6 hours to complete and will be submitted at the end of the unit.
- **Capstone Project:** This will be an ongoing project from units 7-10 and will be delivered as separate milestones and a demo

The table below specifies the percentage weight a given section of the course has on the final grade.

Weight	Section	Description
50%	Assignments	Unit App projects
50%	Capstone Milestones	Original app project and presentation

8.5.1. Capstone Project

Over the last 4 units of the course, students will work **individually** to design, spec, build, test, and demo a fully functioning android application.

8.5.2. Codepath Policies

🎒 Be present.

- **Attendance** at all sessions is mandatory.

- All students are allowed **up to 2 absences** throughout the entire program. Students do not need to submit a request to use these absences.

- We check attendance multiple times throughout a class session and may mark you as absent if you are missing for the majority of a session.

- Students who are absent must still submit the coursework for a unit by the posted deadline.

🙋 Participate.

- Students are expected to actively attend and participate in each session.

- We **strongly encourage** students to turn their cameras on during both lecture and work time to collaborate with their peers, build relationships, and practice professionalism.

📚 Coursework

- Students are required to submit every assignment.

- All students are allowed **up to 2 deadline extensions** of 48 hours to be used on **2 separate assignments**. Students do not need to submit a request to use these extensions; they will be automatically applied.

- Students must submit all assignments before the deadline or deadline extension in order to stay actively enrolled in the course. **Students are not allowed to have any missing assignments at any point during the course.**

> Any of the following will result in a change in your course participation to observer status:
> * Incurring more than 2 absences.
> * Missing 1 assignment submission by the deadline or deadline extension.

👀 **What does observer status in the program mean?**

- You will retain access to all course materials via the course portal (https://courses.codepath.org/) and classes, but you will no longer receive a CodePath certificate of completion at the end of the course.

✅ CodePath Requirements for Course Completion

CodePath holds all professional and college students to the same high bar of quality coursework and professionalism. In order to be considered CodePath alumni and receive recognition for successful completion of the course from CodePath, **students must complete the entire course which implies submitting all required coursework and not exceeding the allowed absences and late coursework counts.** Students meeting the above requirements and have a course score of more than 60% will:

1. Receive a (digital) CodePath certificate of completion.

2. Be considered CodePath alumni and gain access to alumni networks.

3. Continued access to the CodePath Career Center and be eligible for mentorship opportunities with CodePath professional alumni through Codepath Mentor Network.

4. Be invited to the CodePath Emerging Engineers Summit (EES) (https://www.codepath.org/students/emerging-engineers-summit) after the completion of the course.

💼 Career Center Policies (https://docs.google.com/document/d/1VXWUOJ7uiBGviKiURrvW_jSTDUGPKKfSA-GM_xvBII4/view)

8.6. Grade Reports

Students will have access to their CodePath grades through the learning portal. The NJIT professor will have full discretion and the final decision for any grades a student receives in the course. Students should defer to NJIT for specific add/drop, course withdrawal and grading policies.
* CodePath will provide the NJIT professor with all grades and student data from the course.
* The final grade given to a student is decided by the NJIT professor and is independent of the final grade determined by CodePath.

9. Unit Schedule

Wk	Unit # and Topic	Graded Assignment	Session Times	Assignment Deadline
1	**Unit 0** **Intro to class/syllabus review** Students complete and102 application link (https://apply.codepath.com/cohorts/fc-and102-fa24/versions/student/) ** Go over Android pre-work (https://courses.codepath.org/courses/and102/pages/prework) steps to install Android Studio	No assignment, other than to apply to and102 (https://apply.codepath.com/cohorts/fc-and102-fa24/versions/student/)	09/03/2024, 09/05/2024	ASAP
2	**Unit 1: Basics** **Kotlin** Android Studio Lab 1: Tap Counter App (https://courses.codepath.org/courses/and102/unit/1#!labs) *Note: Students will not be able to access the lab or submit the project unless they have submitted their application (24 hours processing time)*	Project 1: Wordle (https://courses.codepath.org/courses/and102/unit/1#!projects)	09/10/2024, 09/12/2024	09/16/2024
3	**Unit 2: Recyclerview** **Using RecyclerViews** Connect RecyclerView to data via Kotlin models Lab 2: CodepathMail (https://courses.codepath.org/courses/and102/unit/2#!labs)	Project 2: Wishlist (https://courses.codepath.org/courses/and102/unit/2#!projects)	09/17/2024, 09/19/2024	09/23/2024
4, 5	**Unit 3: APIs** **API** JSON ** HTTP Get request Lab 3: NY Times Bestselling Books (https://courses.codepath.org/courses/and102/unit/3#!labs)	Project 3: Flixster+ Part 1 (https://courses.codepath.org/courses/and102/unit/3#!projects)	09/24/2024, 09/26/2024; 10/01/2024, 10/03/2024	10/07/2024
6, 7	**Unit 4: Multi-screen Apps** **Creating screens** Passing between screens ** Parsing JSON with Serialization Lab 4: ArticleSearch (https://courses.codepath.org/courses/and102/unit/4#!labs)	Project 4: Flixster+ Part 2 (https://courses.codepath.org/courses/and102/unit/4#!projects)	10/08/2024, 10/10/2024; 10/15/2024, 10/17/2024	10/21/2024
8, 9	**Unit 5: Data Persistence** **Creating database** Data persistence ** Cache data from API calls Lab 5: ArticleSearch Pt 2 (https://courses.codepath.org/courses/and102/unit/5#!labs)	Project 5: BitFit Part 1 (https://courses.codepath.org/courses/and102/unit/5#!projects)	10/22/2024, 10/24/2024; 10/29/2024, 10/31/2024	11/04/2024
10, 11	**Unit 6: Fragments and Navigation** **Fragments vs Activities** Navigation library ** Passing data between fragments Lab #6: ArticleSearch Pt 3: Fragments and Navigation (https://courses.codepath.org/courses/and102/unit/6#!labs)	Project 6: BitFit Part 2 (https://courses.codepath.org/courses/and102/unit/6#!projects)	11/05/2024, 11/07/2024; 11/12/2024, 11/14/2024	11/18/2024

Wk	Unit # and Topic	Graded Assignment	Session Times	Assignment Deadline
12	**Unit 7: Milestone 1** **App Idea Brainstorming** Product Spec-ing ** App Wireframing *No lab*	Group Project Milestone 1 (https://courses.codepath.org/courses/and102/unit/7#!milestones)	11/19/2024, 11/21/2024	11/25/2024

13	**Unit 8: Milestone 2**
	** Build Sprint 1
	Lab 8: Sprint Planning
	  (https://courses.codepath.org/courses/and102/unit/8#!labs)
		Group Project Milestone 2
		  (https://courses.codepath.org/courses/and102/unit/8#!milestones)
			11/26/2024	12/02/2024

14	**Unit 9: Milestone 3** **Build Sprint 2** Demo Day Prep *No lab*	Group Project Milestone 3 (https://courses.codepath.org/courses/and102/unit/9#!milestones)	12/03/2024, 12/05/2024	12/09/2024
15	**Unit 10: Demo Day** ** Demo Day Presentations *Final project submission (slide deck or visual aid) due*	Group Presentation (https://courses.codepath.org/courses/and102/unit/10#!overview)	12/10/2024	12/10/2024

10. Closing Notes

Syllabus is subject to change, attend class to stay current.

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