CS310 - Mobile Application Development

Syllabus – Spring 2023/24

Course Objective

The main objective of this course is to provide students with the tools and skills needed to build applications for the Android platform. The course starts with a brief introduction to Java programming environment and moves forward with creating stateful web services using Java and developing mobile applications consuming web services via the Android platform.

Upon completion of this course, students are expected to design, code and implement applications on mobile and hand-held devices with limited resources, understand web services, manage messaging with HTTP and deploy/consume web services residing on Java Application Servers.

Prerequisites

Applicants are expected to have a basic understanding of writing algorithms and familiarity with the basic concepts of object orientation with some experience in a programming language like C#, C++, etc.

Projected Outline

- **PART 1 – Java Language and Web API's (Backend Programming)**

The objective of this part is to review the basics of Java as an Enterprise Programming Framework. Beginning with Java basics, the Spring Framework will be introduced for coding persistent applications backed by document stores for building microservice architectures. Upon completion, students will be able to use the Java language with efficient resource consumption for applications serving on the internet.

Week-1	Java Introduction - The Big Picture - Classes and Objects -
Week-2	Java Classes and Objects
Week-3	Java Collections and Inner Classes and Exceptions
	Submission of Project Groups (Mar 7th)
Week-4	Introduction to Spring Framework and Microservices
	Project Proposal Submission (Mar 17th)
Week-5	Persistence with Document Stores (MongoDB)
Week-6	MongoDB and Spring Data
Week-7	Spring Web and Rest

- **PART 2 – Android Programming (Frontend)**

The main objective of this part is to give students an introduction to programming on the Android platform and help them build skills needed for approaching and solving coding problems on limited devices. Ergonomic user interface and efficient resource usage (memory, CPU, battery, network, physical disks, etc.) in achieving mobile tasks will be discussed in details.

Week-8	Introduction to Android Framework
Week-9	Activities, Views, Activity Life Cycle, Layouts, Observer Pattern
	Project Phase-1 Submission (Apr 21st)
Week-10	Navigation, Tasks & Backstack, Menus, Fragments
Week-11	Styles, Lists, RecyclerView
Week-12	Multithreading & Concurrency
Week-13	Accessing Web
Week-14	Q/A and Wrap-up
	Project Phase-2 Submission (June 5th)
Finals Week	**Final Exam**

Grading

Midterm Exam : 30% (Graded over 100, date will be announced after Week-3)

Course Project   : *(Grading details are below, please also check Project Proposal Documentation)*

- Proposals   : (Pass/Fail)
- Project Phase-1   : **15%** (Graded over 100)
- Project Phase-2   : **15%** (Graded over 100)

Final Exam   : **40%** (Graded over 100)
                    TOTAL : **100%**

* Your Project Proposal must be accepted in order to continue for Project Phase-1 and Project Phase-2
* Project Submission dates are fixed and will not be extended.
* All exams must be attended and a project must be submitted for not failing the course!
* You must have a proper health report to get make-up exam.

Instructors

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Office Hours
Teaching Assistants will be providing support at office hours, please follow the announcements.

Required Software
You may use any tool that supports Spring Framework and Android Development. However, TA'a and LA's will only provide support for the following tools:

Part 1:
- Spring Tools 4 (Eclipse Version)
  https://spring.io/tools
- Docker Desktop (for MongoDB and testing Microservice deployment)

Part 2:
- Android Studio
  https://developer.android.com/studio