Mobile Programming

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)
  October 3rd – November 20th

  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. Upon completion, students will be able to use the Java language with efficient resource consumption for applications serving on the internet.

  • Overview
  • Review Object Oriented Programming with Java
    • Java Basics
    • Java Classes & Objects
    • Java Collections
    • Nested Classes
  • Introduction to Spring Framework
  • Persistence with Document Stores (MongoDB)
  • Building RESTful Web Services
  • An Introduction to Microservice Architecture

• PART 2 – Android Programming (Frontend)
  November 14th – December 8th

  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.
• **Overview**
• **Projects and Targets**
  § Project Structure
  § Manifest File
  § Creating a Project
  § Using Eclipse and Android Development Tools
  § Emulators and Targets
• **User Interfaces**
  § Resource Files
  § Using UI Widgets
  § Containers
  § Menus
  § Activities
  § Lists
  § Event Management in Android
• **Dealing With Threads In Android**
  § Handlers
  § Asynchronous Tasks
• **Web Services**
  § Consuming RESTful Services
  § Consuming Soap Services
• **Communicating with Internet**
  § REST operations
  § HTTP with HTTPURLConnection
  § Parsing JSON Responses
• **Broadcast Receivers & Services**

**Grading**

Part-1: Homework-1 (25%), Midterm Exam(25%)
Part-2: Homework-2 (25%), Final Exam (25%)

**Instructors**

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**Required Software**

**Part 1:**
- Java SE Development Kit (JDK) . JDK 8, 11, 17 or 19.
  [https://www.oracle.com/java/technologies/downloads/#jdk17-windows](https://www.oracle.com/java/technologies/downloads/#jdk17-windows)
- Spring Tools 4
  [https://spring.io/tools](https://spring.io/tools)
- Docker Desktop (for MongoDB and testing Microservice deployment)

**Part 2:**
- Android Studio

***These systems do not run stably on Turkish Windows, please switch to English Windows as soon as possible. For Macs and Linux systems, no additional effort is required.***