

Course: 501-02 - Advanced Mobile computing

Course Code	501-02
Course Title	Advanced Mobile computing
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	February, 2022
Implementation	A.Y.2022-2023
Purpose of Course	Mobile application development with Kotlin is a modern programming language that brings together the best of object-oriented and functional programming. Kotlin remains one of the most widely used and fastest-growing programming languages in recent years. The demand for Kotlin is on the rise and it will continue to grow in the years to come. Exchanging data between application is also most popular. It is essential to perform database operation on Android application such as storing, manipulating or retrieving data from database. Knowledge about all this concept in Android platform is enhance the skills.
Course Objective	<ol style="list-style-type: none"> 1) To understand the concept of Kotlin 2) Developing basic application 3) To understand various concepts of JSON, building multiple screen application and use of Intent in application. 4) Concepts of storing Android application data into database
Pre-requisite	Paper-305-02 (Mobile Application Development -1) in Semester-3. Paper-405-02 (Mobile Application Development -2) in Semester-4.
Course outcome	<ul style="list-style-type: none"> - Students will be able to understand the concepts Kotlin - Students will have knowledge of object-oriented concept and development of basic apps using Kotlin - Working with JSON - Knowledge of storing data into database
Course Content	<p>Unit-1: Introduction to Kotlin</p> <ol style="list-style-type: none"> 1.1 Concepts of Kotlin and its introduction. 1.2 Downloading IntelliJ and its settings. 1.3 Variables: <ol style="list-style-type: none"> 1.3.1 val vs. var, Byte, Short, Int, Long, Float, Double, Boolean, and Char. 1.3.2 String, Nullable variables. 1.4 Conditional statements: if and when. Difference between if and when. <ol style="list-style-type: none"> 1.4.1 ranges, types, values of function calls 1.5 Arrays and Lists: <ol style="list-style-type: none"> 1.5.1 create, modify, and access arrays 1.5.2 creating, modifying, and accessing lists 1.6 Loops (Iterative statements) <ol style="list-style-type: none"> 1.6.1 for and while loop. 1.6.2 break, continue and return <p>Unit-2: OOPS Concepts with Kotlin</p> <ol style="list-style-type: none"> 2.1 Object oriented concepts: <ol style="list-style-type: none"> 2.1.1 Properties, methods and basics of objects and classes in Kotlin 2.1.2 Named parameters, constructors. 2.2 open classes and inheritance. <ol style="list-style-type: none"> 2.2.1 Named parameters and Default values 2.2.2 Open and Abstract 2.2.3 Interface 2.2.4 Getters and Setters 2.2.5 visibility of properties, methods and class <p>Unit-3: Kotlin Apps</p>

	<p>3.1 Developing basic Apps using Kotlin</p> <p>3.1.1 Setup Play Project, The Constraint Layout</p> <p>3.1.2 Constraints and Resizing, Positioning Widgets, Inner Lines within a Widget</p> <p>3.1.3 Layouts on Different Devices, Layout Designer rendering error</p> <p>3.1.4 Baseline Constraints</p> <p>3.2 Constraining Widgets, Add Scrolling Capabilities</p> <p>3.2.1 Events and setonclicklistener</p> <p>3.2.2 Fixing Kotlin Gradle Issues</p> <p>3.2.3 The Activity Lifecycle</p> <p>3.2.4 The Logcat Pane</p> <p>3.2.5 Logging the Activity Lifecycle</p> <p>3.2.6 Saving and Restoring Instance State</p> <p>Unit-4: JSON Concept</p> <p>4.1 Concept and Features of JSON, Similarities and difference among JSON and XML</p> <p>4.2 JSON objects (with string and Numbers))</p> <p>4.3 JSON Arrays and their examples:</p> <p>4.3.1 Array of string, Array of Numbers, Array of Booleans, Array of objects, Multi-Dimensional Arrays</p> <p>4.3.2 JSON comments</p> <p>4.4 Building multi-screen apps:</p> <p>4.4.1 Intents and their applications, types of intents,</p> <p>4.4.2 Data exchange from one activity to another using intent</p> <p>4.5 Working with implicit intents:</p> <p>4.5.1 Opening web URLs through app</p> <p>4.5.2 Sharing media from our app to other apps</p> <p>Unit-5: Storing Android application data using Database and JSON [Any open-source database can be used. MySQL or SQLite is preferable]</p> <p>5.1 Setting up virtual server on local computer</p> <p>5.2 Connecting Android based App with Database</p> <p>5.3 CRUD operations (Create, Read, Update, Delete) using APP:</p> <p>5.3.1 Create and insert data to the database</p> <p>5.3.2 Read, Update and Delete data from database.</p> <p>5.4 Accessing user’s current location</p> <p>5.5 Capturing image using device camera (ACTION_IMAGE_CAPTURE Intent of MediaStore class.)</p> <p>[All Units carry Equal Weightage]</p>
Reference Books	<ol style="list-style-type: none"> 1. Android Studio 4.0 Development Essentials – Kotlin Edition, Author – Neil Smyth, Publisher: Payload Media, ISBN – 13: 978 – 1 – 951442 – 19 – 4 2. Android Programming with Kotlin for Beginners, Author – John Horton, Publisher: Packt Publication, ISBN – 13: 978 – 1789615401 3. Mastering Kotlin - Learn advanced Kotlin programming techniques to build apps for Android, iOS, and the web, Author – Nate Ebel, Publisher: Packt Publication, ISBN – 13: 978 – 1838555726 4. Kotlin in Action 1st Edition, Author – Dmitry Jemerov & Sevtlana Isakova, Publisher: Manning Publications Co., ISBN – 13: 978 – 1617293290 5. JSON Quick Syntax Reference, Author – Wallace Jackson, Publisher: Apress, ISBN: 9781484218631 6. Beginning Json, Author – Ben Smith, Publisher – Apress, ISBN: 9781484240427 7. Android Studio 3.0 Development Essentials: Android 8 Edition Author – Neil Smyth, Publisher: Payload Media, ISBN – 13: 978 – 1977540096
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.