



Estd. 1962  
NAAC 'A' Grade

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दुरध्वनी (ईपीएबीएक्स) २६०९००० (अभ्यास मंडळे विभाग- २६०९०९४)

फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३. e-mail: bos@unishivaji.ac.in

SU/BOS/Sci & Tech/

**No 00465**

Date: **15 FEB 2021**

To,

The Principals,  
All Affiliated Colleges/Institutions,  
Shivaji University, Kolhapur

The Head,  
Computer Science Department,  
Shivaji University, Kolhapur

**Subject:** Regarding minor changes in syllabus of **M. Sc. Computer Science**  
Under Faculty of Science & Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to minor changes in syllabus of **M.Sc. Part-I Sem-II Computer Science** under Faculty of Science & Technology which is enclosed herewith.

| Old Title                  | New Title                              |
|----------------------------|--|
| CC-203 Android fundamental | CC-203 Android Development with Kotlin |

This minor changes in syllabus will be implemented from academic year 2020-21 onwards.

You are therefore, requested to bring this to the notice all students and teachers concerned.

Thanking you,

Yours faithfully,

Dy. Registrar

Copy to :-

- |   |   |    |                               |
|---|---|----|-------------------------------|
| 1 | The Dean, Faculty of Science & Technology | 8  | Appointment Section           |
| 2 | The Chairman, Respective, BOS             | 9  | Centre for Distance Education |
| 3 | Exam Section                              | 10 | IT Cell                       |
| 4 | Eligibility Section                       | 11 | Affiliation Section (J.G.)    |
| 5 | O.E. I Section                            | 12 | Affiliation Section (P.G.)    |
| 6 | O.E. II Section                           | 13 | P.G. Admission Section        |
| 7 | O.E. III Section                          | 14 | P.G. Seminar Section          |

**MSc-I Semester-II (Computer Science)**  
**CC-203: Android Development with Kotlin**  
**MSc (Choice Based Credit System)**  
**To be implemented from the academic year 2020-2021**  
**External Marks-80 Internal Marks -20 Theory-04 hrs. /week**

**Course outcomes:**

- 1) Comprehend Kotlin language
  - 2) Understand Android Studio Environment and application structure.
  - 3) Demonstrate different layouts, views, activities and intents
  - 4) Design good user interface for the application.
  - 5) Able to store, retrieve and load data
  - 6) Demonstrate programming skills using Kotlin
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**Unit 1 – Introduction to Kotlin**

**[15hrs]**

**Kotlin basics:** Introduction to Kotlin, Benefits of using Kotlin, Use Kotlin REPL to practice basic expressions, Control flow statements in Kotlin, Null safety with Kotlin. **Functions:** Creating and calling functions with default and named arguments, Writing concise and compact functions, Passing functions as arguments to other functions, Writing simple lambdas.

**Classes and Objects:** Introduction to object-oriented programming in Kotlin, Classes and objects in Kotlin, Constructors, Visibility modifiers, Subclasses and inheritance, Interfaces, Data classes, Singleton class enums, Pairs, triples and collections in Kotlin, Extensions in Kotlin

**Unit 2 – Introduction to Android**

**[15hrs]**

**Buildind first Android app:** Installing Android Studio, Creating an Android app project, Deploying the app to an emulator or a device, Building an Android app that contains images and a click handler, Modifying views within the layout of an app, Adding libraries to module gradle file. **Layouts:** Creating layouts in Android Studio using XML and the Layout Editor, Adding interactivity to your app, Working with ConstraintLayout, Data binding basics

**App Navigation:** Creating Fragments, Defining NavHostFragment, navigation graphs, navigational paths, Functionality of Back and Up buttons, Defining the options menu, Creating a navigational drawer, Using the Safe Args plugin and passing of arguments, Starting an external Activity.

### **Unit 3 – Android Application Architecture**

**[15hrs]**

**Activity and Fragment Lifecycles:** Understanding Activity and Fragment Lifecycles, Exploring logging options in your app, Using the Android Lifecycle library, Exploring configuration changes

**App Architecture (UI Layer) :** Using the recommended Android App Architecture, Using the Lifecycle, ViewModel, and ViewModelFactory classes, Adding LiveData and LiveData, observers, Adding Data Binding with ViewModel and LiveData, Adding LiveData , transformations

**App Architecture (Persistence):** Overview of Room Persistence Library, Introduction to coroutines, **Advanced RecyclerView use cases:** Introduction to RecyclerView Fundamentals, Implementing data binding with RecyclerView, Using GridLayout with RecyclerView, Interacting with RecyclerView items, Adding headers in RecyclerView

### **Unit 4 – Connect to the Internet and App Design**

**[15hrs]**

**Connect to the Internet:** Connecting to a web service with the Retrofit library, Parsing a JSON response with the Moshi library, Using coroutines with Retrofit , Loading and displaying images from the Internet, Filtering data from the Internet.

**Repository pattern and WorkManager:** Adding an offline cache and repository, Implementing WorkManager, Working with background workers and periodic WorkerRequest

**App UI Design:** Introduction to basic app design, Understanding Styles and Themes, Implementing Material Design, Designing for everyone

#### **References:**

1. <https://developer.android.com/kotlin>
2. <https://developer.android.com/kotlin/getting-started-resources>
3. Kotlin for Android Developers: Learn Kotlin the Easy Way While Developing an Android App by , Antonio Leiva (Free ebook )
4. Learn Android Studio 3 with Kotlin: Efficient Android App Development by, Ted Hagos, Apress publisher.
5. **Error! Hyperlink reference not valid.**