



# Specialization/Minor in Android

EFFECTIVE FOR 2021-22 BATCH

2<sup>ND</sup> YEAR TO 4<sup>TH</sup> YEAR

## Eligible Branches to adopt as Specialization

1. B.Tech.- Computer Science & Engineering



**VEER MADHO SINGH BHANDARI  
UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN**

**Evaluation Schemes for Specializations/Minor in B.Tech**

<b>Specialization in Android</b>										
S.No.	Code	Sem	Subject	Periods			Evaluation Scheme		Total Marks	Credits
				L	T	P	Internal	External		
1.	SAN301	3 <sup>rd</sup>	Programming for Android	3	0	0	50	100	150	3
2.	SAN401	4 <sup>th</sup>	Exploring Rx Java in Android	3	0	0	50	100	150	3
3.	SAN501	5 <sup>th</sup>	Learning Android Development	3	0	0	50	100	150	3
4.	SAN601	6 <sup>th</sup>	Fundamentals of Android	3	0	0	50	100	150	3
5.	SAN701	7 <sup>th</sup>	Android Application Development	3	0	0	50	100	150	3
6.	SAN801	8 <sup>th</sup>	Mobile App Development with React Native	3	0	0	50	100	150	3
<b>Total</b>				<b>18</b>	<b>0</b>	<b>0</b>	<b>300</b>	<b>600</b>	<b>900</b>	<b>18</b>



**VEER MADHO SINGH BHANDARI  
UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN**

<b>SAN301</b>	<b>PROGRAMMING FOR ANDROID</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

<b>Contents</b>		<b>Hours</b>
<b>Unit 1</b>	<b>Fundamentals of Programming</b> OOPS, Software Engineering, SQL Queries, Basics of Designing Technologies.	8
<b>Unit 2</b>	<b>LEARNING THE LANGUAGE (JAVA)</b> Introduction to Java, Bytecodes and Java Virtual Machine, Applications and Applets, Java Development Kit, Data types, Loops, Conditionals, Operators, Arrays, Classes and Objects, Encapsulation, Constructors, Inheritance, Method Overriding, Polymorphism, Abstract Methods and classes, Interface, Packaging, Exceptional Handling, Multitasking, Multi threading, Synchronization, Java I/O, XML Parse using DOM, SAX Parser, Abstract Windows Toolkit, Component, Java Swing	8
<b>Unit 3</b>	<b>ANDROID OS</b> Introduction to Java And Android, Introducing Development Framework, Dalvik Virtual Machine – DVM, Developing with Eclipse, Android Virtual Device and SDK Manager, Android Architecture and OOPS, Android Development Tools, Android Asset Packaging Tool (AAPT), Android Debug Bridge, Types of Android Applications, Android Architecture and OOPS, Activity Lifecycle, Activity Classes, Introduction to Application Manifest, Installing Android, Component Lifecycle	8
<b>Unit 4</b>	<b>BUILDING MOBILE APPLICATIONS WITH ANDROID</b> Android Layouts, Android UI and Advance Java, Android GUI Architecture, Layouts, Android Widget Toolbox, WebView, GridView, Understanding Android Menus, Intents and Processes, Graphics Animation and Multimedia, Bitmaps	8
	<b>DATABASE CONNECTIVITY</b> SQLite Data Types, Cursors and Content Values, SQLite Open Helper, Adding, Updating and Deleting Content	

**Suggested Readings:**

1. **Android Programming: Pushing the Limits, By Erik Hellman**
2. **Beginning Android Programming with Android Studio, By Jerome DiMarzio**
3. **Professional Android 2 Application Development, By Reto Meier**



**VEER MADHO SINGH BHANDARI  
UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN**

<b>SAN401</b>	<b>EXPLORING RX JAVA IN ANDROID</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

<b>Contents</b>		<b>Hours</b>
<b>Unit 1</b>	<b>RxJava Introduction</b> RxJava introduction, OOPs Concepts, Environment Setup	8
<b>Unit 2</b>	<b>Observables</b> Working of Observables, Creating Observables, Single Observable, Maybe Observable, Completable Observable, Using Composite Disposal	10
<b>Unit 3</b>	<b>Operators</b> Creating Operators, Transforming Operators, Filtering Operators, Combining Operators, Utility Operators, Conditional Operators, Mathematical Operators, Connectable Operators.	8
<b>Unit 4</b>	<b>Subjects</b> Introduction to subjects, Publish subjects, Behavior subjects, Replay subjects, Async subjects.	10
<b>Unit 5</b>	<b>Schedulers</b> Introduction to schedulers, Trampoline schedulers, New Thread schedulers, Computation schedulers, IO schedulers, From schedulers.	9

**Suggested Readings:**

- 1. Learn Android App Development, By Wallace Jackson**
- 2. Android Programming with Kotlin for Beginners: Build Android apps starting By John Horton**
- 3. The Complete Android Guide, By Kevin Purdy**



**VEER MADHO SINGH BHANDARI  
UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN**

<b>SAN501</b>	<b>LEARNING ANDROID DEVELOPMENT</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

<b>Contents</b>		<b>Hours</b>
<b>Unit 1</b>	Introduction to Android, Smartphone features, Installing the SDK, Creating Android Emulator, Installing Eclipse, Installing Android development tools, Choosing which Android version to use.	8
<b>Unit 2</b>	Android Life cycle, Android applications structure, Creating a project, Working with android manifest, XML, Various controls, Layouts.	12
<b>Unit 3</b>	Text controls, Button controls, Images, Supporting Multiple Screen, Activities, Application context, Intent WebView.	8
<b>Unit 4</b>	List View, Spinner, AutoComplete Textview, MultiAutoComplete Textview, Toast, Dialogue Notification, Statusbar Notification.	8
<b>Unit 5</b>	<b>Content Providers</b> Options Menu, Context Menu, Google Map, Building a small android application, Uploading the android application on play store.	9

**Suggested Readings:**

1. Android App Development: A Complete Tutorial For Beginners, By Padmini
2. Learn Android App Development, By Wallace Jackson
3. Android Programming with Kotlin for Beginners: Build Android apps starting  
By John Horton



# VEER MADHO SINGH BHANDARI UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN

<b>SAN601</b>	<b>FUNDAMENTALS OF ANDROID</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

<b>Contents</b>		<b>Hours</b>
Unit 1	<b>Introduction to Android</b> Introduction Android, Android Run Time, Android Studio, Introduction to Gradle	10
Unit 2	<b>Fundamentals</b> Basic Building blocks – Activities, Services, Broadcast Receivers & Content providers UI Components- Views & notifications, Components for communication - Intents & Intent Filters, Android API levels (versions & version names).	12
Unit 3	<b>Application Structure</b> AndroidManifest.xml, uses-permission, Activity/services/receiver declarations, Layouts & Draw able Resources, Activities and Activity lifecycle	10
Unit 4	<b>Emulator</b> Launching emulator, Editing emulator settings, Emulator shortcuts, Logcat usage, Introduction to Android Device Monitor (ADM), File explorer.	8
	<b>Basic UI design, Styles &amp; Themes</b> Form widgets , Text Fields, Layouts, RelativeLayout ,TableLayout, FrameLayout, LinearLayout, Nested layouts, styles.xml, drawable resources for shapes,gradients(selectors, Style attribute in layout file, Applying themes via code and manifest file, AlertDialogs & Toast, Time and Date, Images and media	

**Suggested Readings:**

1. **Beginning Android Programming with Android Studio, By Jerome DiMarzio**
2. **Professional Android 2 Application Development, By Reto Meier**



**VEER MADHO SINGH BHANDARI  
UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN**

<b>SAN701</b>	<b>ANDROID APPLICATION DEVELOPMENT</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

<b>Contents</b>		<b>Hours</b>
<b>Unit 1</b>	<b>Refreshing Java</b> Java introduction, OOPs Concepts, Abstract class & Interface, Exception handling, Multi threading (Thread class & Runnable Interface)	8
<b>Unit 2</b>	<b>Basic UI design, Styles &amp; Themes</b> Form widgets, Text Fields, Layouts , Applying themes via code and manifest file, Alert Dialogs & Toast, Time and Date, Images and media	12
<b>Unit 3</b>	<b>Content Providers</b> SQL, DML & DDL Queries in brief, SQLite Database, SQLite Open Helper, Cursor, SQLite Programming, Reading and updating Contacts, Android Debug Bridge(adb) tool, Broadcast Receivers, Services	8
<b>Unit 4</b>	<b>Customize App</b> Toast, Dialogs, Tabs, Animated popup panels, Grid view, Spinner, Thread, Android JSON parsing using Volley, Create REST API for Android app using PHP, MySQL, Accessing Phone services (Call, SMS)	8
	<b>Fragments</b> Introduction to fragments, Fragments Life Cycle, Fragments in Activity, Google Maps V2 using Fragments, Develop Fragment based UI designs (Fragment Tabs,ListView etc), Location based Services, GPS, Geocoding, Network connectivity services, Sensors(Accelerometer, Gyroscope), Using Wi-Fi& Bluetooth, Google Cloud Messaging for Android, App Widgets.	

**Suggested Readings:**

1. Learn Android App Development, By Wallace Jackson
2. Android Programming with Kotlin for Beginners: Build Android apps starting By John Horton
3. The Complete Android Guide, By Kevin Purdy



# VEER MADHO SINGH BHANDARI UTTARAKHAND TECHNICAL UNIVERSITY DEHRADUN

<b>SAN801</b>	<b>MOBILE APP DEVELOPMENT WITH REACT NATIVE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		3	0	0	3

<b>Contents</b>		<b>Hours</b>
<b>Unit 1</b>	Android app, Widgets allow, Android Studio, Widget Provider class and its built-in functions, in-depth review of widget capabilities and limitations, Android layout and functionality, App Widget Provider functions, widget host and collections.	8
<b>Unit 2</b>	virtual environments in Android, immersive 3D environments, VR animation, lighting, reflection, textures and handling multiple 3D objects.	8
<b>Unit 3</b>	React Native, JavaScript, ES6, React, JSX, Components, Props, State, Style, Components, Views, User Input, Debugging, Data Navigation, Expo Components, Redux, Performance, Shipping, Testing.	8
<b>Unit 4</b>	Basic UI design, Styles & Themes Form widgets, Text Fields, Layouts , Applying themes via code and manifest file, Alert Dialogs & Toast, Time and Date, Images and media	8
	<b>Content Providers</b> SQL, DML & DDL Queries in brief, SQLite Database, SQLite Open Helper, Cursor, SQLite Programming, Reading and updating Contacts, Android Debug Bridge (ADB) tool, Broadcast Receivers, Services	

Suggested Readings:

1. Android App Development: A Complete Tutorial For Beginners, By Padmini
2. Learn Android App Development, By Wallace Jackson
3. Android Programming with Kotlin for Beginners: Build Android apps starting  
By John Horton