COURSE TITLE	**ADVANCED ANDROID PROGRAMMING**
COURSE CODE	**05MB0301**
COURSE CREDITS	**6**

Objective:

1 Students will able to develop their concepts about data communication in application.
2 Students will able to learn about location-based services of android application.
3 Goal is Develop proficiency in to learn about the Services.
4 Students will able to develop their concepts about data communication in application.
5 Students will able to learn about Background Services.

Course Outcomes: After completion of this course, student will be able to:

1 Develop applications with services-Bound & Unbound, Basic animations. Students will able to create application with the features of animations.
2 Improve efficiency with background processing, multithreading, caching, and memory management techniques.
3 Efficiently manage background tasks using Services, WorkManager, JobScheduler, and Kotlin Coroutines.
4 Fetch, parse, and display data from XML and JSON-based web services using Retrofit and Volley.
5 Implement Firebase Authentication, Realtime Database, Firestore, Cloud Storage, and Push Notifications.
6 Work with device capabilities such as GPS, Camera, Fingerprint Authentication, Accelerometer, and Proximity Sensors.

Pre-requisite of course: Basic Knowledge of Android Programming

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	8	50	30	20	50	50

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Contents : Unit	Topics	Contact Hours
1	**App Development Topics- Graphics & Multimedia** Services and Notifications – bound/unbound services,Android Interface Definition Language,SMS application using Broadcast Receiver,Embedded Apps:Telephony, SMS, etc, Introduction to Graphics,Frame Animations, Tweening, scale, rotate, translate, alpha, Interpolation,Canvas/Drawing into a view, Surface View/Surface Holder,Crossfading Two Views, ViewPager for Screen Slide, Card Flip, Zooming, and Layout Changes,Bitmaps - Loading, Processing Bitmaps with thread, managing Bitmap Memory and UI	15
2	**Mobile Web Applications** Web Applications - Web View, ViewPort, Page navigation, Debugging web applications,Web Services – Android Server Communication: communication protocols, interacting with server-side applications,developing clients for web services, Exchanging Data over the Internet data parsing using JSON and XML parsing,Cloud - Connectivity and Sync to the Cloud, Google Services,Integrating with 3rd party Apps using Web Services,Commercializing your application	15
Total Hours		**30**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Unit-1** Develop a music player using a foreground service with media controls,Implement a background service to fetch real-time GPS location updates, Use JobScheduler to schedule periodic background tasks like syncing data,Fetch and parse XML data from a public API using XmlPullParser, Retrieve and parse JSON data from an API using Retrofit and Gson,Display parsed JSON data in a RecyclerView.	30
2	**Unit-2** Implement Firebase Authentication using Google and Email/Password login,Create an app that reads and writes data from Firebase, Set up push notifications using Firebase Cloud Messaging,Develop an app to upload and fetch images from Firebase., Use the device camera to take photos and display them in an ImageView,Implement an audio recorder app using native APIs	30

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
3	**Unit-3** Fetch and display the contact list from the user's device,Secure an app using biometric authentication (fingerprint scan), Read accelerometer sensor data to detect device tilts,Use the proximity sensor to automatically answer calls when the phone is near the ear,Build a pedometer app using motion sensors to count steps, Implement WorkManager to perform scheduled background tasks,Build an app using Jetpack Navigation for smooth screen transitions,Implement a local database using Room and LiveData	30
Total Hours		**90**

Textbook :

1 Head First Android Development: A Brain-Friendly Guide, Reto Meier, John Wiley and Sons, 2017

2 Android in Action, Third Edition, W. Frank Ableson, RobiSen, Chris King, C. Enrique Ortiz Publications, 2012

References:

1 Professional Android 4 Development, Professional Android 4 Development, Reto Meier, John Wiley and Sons, 2012

2 Beginning Android 4, Beginning Android 4, Grant Allen, Apress, 2011

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

1 PPT,BOARD WORK,PRACTICALS

Supplementary Resources:

1 https://developer.android.com/

2 https://www.vogella.com/tutorials/android.html

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