

## Semester - 2

<b>Code</b>	<b>Course</b>	<b>No. Of Lectures/ Lab (Per Week)</b>	<b>Credit</b>
CS-07	APPLICATION DEVELOPMENT USING ADVANCED ANDROID	5	5
CS-08	REACT JS & EXPRESS JS	5	5
CS-09	CLOUD COMPUTING	5	5
CS-10	PRACTICAL - 1 (BASED ON CS-07)	5	5
CS-11	PRACTICAL - 2 (BASEDON CS-08 & CS-09)	5	5
CS-12	PROJECT DEVELOPMENT(In House)	5	5
Total Credits of Semester-2			<b>30</b>

## **CS – 07: APPLICATION DEVELOPMENT USING ADVANCED ANDROID**

### **Objective:**

- To be able to develop mobile applications using advanced android api based on
- Data storage in external and internal memory and database
- To develop app that supports animation, multimedia, camera, sensor
- To develop app that supports Network, Bluetooth-Wi-Fi
- Developing web service and retrieving data using JSON & xml
- Packaging and distributing android app

### **Pre-Requisites:**

- OOPS concepts, Programming in core java, Basic Android Programming.

## **Unit – 1**

### **Basics of Android & UI Design**

- Core building blocks, Android manifest.xml file, R.java file, Basic UI widgets, Activity, Layout, Internet

### **Working with view and adaptor**

- Adaptors: Array adaptor, Arraylist adaptor
- SimpleCursorAdapter, Base adaptor Views: GridView, ScrollView, WebView, SearchView, TabHost DynamicListView, ExpandedListView

### **Multimedia API**

- Audio – Recording audio, Playing audio
- Video– Recording video, Playing video
- Alarm Manager
- Camera-Capturing pictures, configuring camera mode settings, camera parameters, zooming camera

## **Unit - 2**

### **Data Storage & SQLite**

- Shared Preferences
- Android File System
- Internal storage, External storage
- SQLite : Storing data using SQLite, Querying SQLite database insert-update-delete operations, Persistent database using SQLiteOpenHelper and creating a database

### **Content Provider. Intent & Notifications**

- Accessing built in content providers
- Searching for content
- Adding, changing, and removing content
- Creating content provider
- Sending & Receiving Broadcast
- Notifying user, Notifying with status bar

## Unit – 3

### Device Connectivity

- Bluetooth Tutorial –existence of Bluetooth, enable Bluetooth discover devices, List Paired Devices, establishing connection between devices
- Working with WiFi

### Working with Sensor

- Sensor API
- Working with different sensors :Motion Sensor, Position Sensor, Environmental Sensor Sensor Values, SensorManager class, Sensor Class, SensorEvent class, SensorEventListener interface, Compass Acceslerometer and Orientation Sensors
- Reading sensor data, calibrating sensors, determining device orientation

### Android Web Service

- Introduction to web service
- Soap Vs Restful web service
- Android Restful web service example with java servlet
- Storing data into external database
- Verifying data in android with external database

## Unit – 4

### Introduction of Retrofit Parsing

- Introduction of Retrofit
- Android Retrofit Tutorial to Get JSON From Server Using Retrofit Call Perform Insert , Update , Delete using php MySql server

### WiFi & Bluetooth

- Monitoring and managing Internet connectivity
- Managing active connections
- Managing WiFi networks
- Controlling local Bluetooth device
- Discovering and bonding with Bluetooth devices
- Managing Bluetooth connections
- Communicating with Bluetooth

## Unit – 5

### Location Based Services and Google Maps

- Location Based Services - Finding current location and listening for changes in location, Proximity alerts, Working with Google Maps
- Showing google map in an Activity
- Map Overlays
- Geocoder
- Displaying route on map

## **Drawing Animation and Graphics programing**

- Drawing on screen – using canvas and paint
- Working with bitmap, shapes
- 2D Animation - Drawable, View, Property animation

## **Packaging Deploying and distributing / selling app**

- Signing certificate
- Distributing android app via Google Play
- Obfuscating and optimizing with ProGuard

## **References Books:**

- Advanced Android Application Development – Joseph Annuzzi, Lauren darcey Shane Conder – 4th Edition, Addison – Wesley
- Android cookbook - Ian F. Darwin Oreilly
- The Android Developer’s CookBook – Building Application with Android SDK – 2nd Edition, Addison – Wesley

## CS - 08 : REACT JS & EXPRESS JS

### Objective:

- What is React JS?
- Why React JS is useful?
- Explore the basic architecture of a React application.
- Explore various attributes of web development.
- Explore various web development techniques of this JavaScript and would learn new techniques based on industry requirement.
- Gain a deep understanding of JSX and Hooks.

### Pre Requisites:

- Java Script, HTML, CSS and OOPs

## Unit - 1

### Express JS & Java Script

- **Java Script**
  - Java Script Overview & Basics
  - Variable, Conditional Statements, Loops in JS,
  - Functions, Arrays & Events in JS
  - ES6 Overview & Basics
  - ES6 Classes, functions & Promises
- **Express JS**
  - Setting up an app with ExpressJS, Routing in ExpressJS, Connecting views with templates, configurations and error handling.

## Unit - 2

### Introduction to JSX & REACT JS

- **Introduction:** What is ReactJS? Installation or Setup, Hello World Program, Create a first app, folder structure
- **Components:** Creating components, Basic components, Nesting components, functional component, class component
- **Introduction to JSX:** JSX Programs
- **Props:** ReactJS Props, React State, Destructuring Props and State, setState, methods as Props.

## Unit - 3

### Form Handling. components and fragments

- **Event Handling:** Event Handling and Binding event handlers
- **Rendering:** Conditional Rendering and List Rendering, List and keys, Index as Key Anti-pattern
- **Introduction:** Basic form handling
- **Components:** Components Life Cycle Methods, Components Mounting Lifecycle methods, Components Updating Lifecycle methods, Pure Components
- **Fragments**

## Unit – 4

### Memo, Refs, Props and Context

- **Memo**
- **Introduction to Refs:** Refs, Refs with Class Components, Forwarding Refs and Portals
- **Components:** Higher Order Components
- **Props Again:** Rendering Props and Context
- **HTTP:** HTTP and React, GET and React, POST and React.

## Unit – 5

### Introduction to Hooks and its implementation

- **Introduction:** React Hooks introduction, useState Hook, useState Previous state, useState with object, useState with array.
- **useEffect:** useEffect Hook, useEffect after render, Conditionally run effects, run effects only once, useEffect with cleanup, useEffect with incorrect dependency.
- **Fetching data:** Fetching data with useEffect, useContext Hook
- **useReducer Hook:** useReducer – simple state and action, complex state and action, multiple useReducers
- **useContext:** useContext, useReducer, Fetching, data with useReducer, useState vs useReducer

### References Books

1. Learning React, Martin Bean, Kirupa Chinnathambi Pearson Addison Wesley
2. ReactJS Notes for Professional, GoalKicker, Website ebook,
3. The Road to React\_ Your journey to master plain yet pragmatic React, LeanPub Book, RobinWieruch - Independently Published (2020)
4. Codevolution. "ReactJS Tutorial for Beginners." YouTube, YouTube, [www.youtube.com/playlist?list=PLC3y8-rFHvwwg3vaYJgHGnModB54rxOk3](https://www.youtube.com/playlist?list=PLC3y8-rFHvwwg3vaYJgHGnModB54rxOk3).

## **CS - 09: CLOUD COMPUTING**

### **Objective:**

- To describe cloud computing architecture and services
- To identify cloud platforms and services
- To identify design issues of cloud computing
- To analyze the security factors of implementing cloud environment
- To understand the server virtualization and its implementation
- To review real time applications of cloud computing

### **Pre Requisites:**

- Knowledge of Advance Computer Networks is mandatory

## **Unit - 1**

### **Overview of Computer paradigm**

- Recent trends in Computing:
  - Grid Computing
  - Cluster Computing
  - Distributed Computing
  - Utility Computing
  - Cloud Computing

### **Introduction of Cloud Computing**

- Cloud Architecture
- Cloud Computing (NIST Model):
  - Introduction to Cloud Computing
  - Cloud service providers properties
- Characteristics & Disadvantages:
  - Pros & cons of Cloud computing
  - Cloud Computing vs Cluster Computing vs Grid computing
  - Role of open standards
- Management and Administration of Cloud Services.

### **Cloud computing Architecture**

- Cloud computing stack:
  - Comparison with traditional computing architecture (client/server)
  - Services provided at various levels
  - How Cloud Computing Works
  - Role of Networks in Cloud computing
  - Protocol used
- Role of Web service: Service Models (XaaS):
  - Infrastructure as a Service(IaaS)
  - Platform as a Service(PaaS)
  - Software as a Service(SaaS)
- Deployment Models:
  - Public cloud
  - Private cloud

- Hybrid cloud
- Community cloud

## Unit – 2

### **Infrastructure as a Service(IaaS)**

- Introduction to IaaS:
  - IaaS definition,
  - Introduction to virtualization,
  - Different approaches to virtualization,
  - Hypervisors
- Virtual Machine(VM): Resource Virtualization:
  - Server
  - Network
  - Virtual Machine(resource) provisioning and manageability
  - storage as a service
  - Data storage in cloud computing(storage as a service)
  - Examples: Amazon EC2, Renting, EC2 Compute Unit, Platform

### **Cloud Security**

- Infrastructure Security:
  - Network level security
  - Host level security
  - Application level security
- Data security and Storage:
  - Data privacy and security Issues
  - Jurisdictional issues raised by Data location
  - Identity & Access Management
  - Access Control Trust
  - Risk Authentication in cloud computing
  - Commercial and business

## Unit – 3

### **Platform as a Service(PaaS)**

- Introduction to PaaS :
  - What is PaaS, Service Oriented Architecture(SOA)
- Cloud Platform and Management:
  - Computation
- Storage Examples:
  - Google App Engine
  - Microsoft

### **Software as a Service(SaaS)**

- Introduction to SaaS Web services
- Web 2.0
- Web OS
- Case Study on SaaS

## **Service Management in Cloud Computing**

- Service Level Agreements(SLAs)
- Billing & Accounting
- Comparing Scaling Hardware:
  - Traditional vs. Cloud
- Economics of scaling:
  - Benefitting enormously
- Managing Data:
  - Looking at Data
  - Scalability & Cloud Services
  - Database & Data Stores in Cloud
  - Large Scale Data

## **Unit - 4**

### **Virtualization**

- Virtualization Technology
- Virtualization objectives
- Types of virtualization
- Virtualization implementation
- Virtual servers introduction
  - Xen server-Hyper V – I
  - Hyper V – II
  - VMWare – I
  - VMWare – II

## **Unit – 5**

### **Case Study on Open Source & Commercial Clouds**

- Eucalyptus
- Microsoft Azure
- Amazon EC2

### **References Books**

1. Kenneth Hess, Amy Newman – Practical Virtualization Solutions – Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumaraswamy – Cloud Security and Privacy : An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009
3. Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridge University Press, 2010
4. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010
5. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg

**CS - 10 PRACTICAL - 1 (Based on CS - 07) 100 Marks**  
CS - 07 - Application Development Using Advanced ANDROID

**CS - 11 PRACTICAL - 2 (Based on CS - 08 & CS - 09) 100 Marks**  
CS - 08 - React JS & Express JS  
CS - 09 - Cloud Computing

**CS - 12 PROJECT 100 Marks**

**PROJECT DEVELOPMENT (IN HOUSE)**

(Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester.

At the time of Project-Viva examination student must show Project Report (in hard copy) along with all the Workouts in workbook, implementation of project in SDLC Documentation, Program codes and project in running mode

**Note :**

- Project must be submitted before two week of commencement of theory exam.
- Project viva examination may be arranged before or after theory exam.
- During the project viva examination project must be run.

**Paper Style**

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**Unit : 01**

Question : 1 (A)	Answer The Following Question	(Only Three)	03
Question : 1 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 1 (C)	Answer The Following Question	(Any One out of Two)	05

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**Unit : 02**

Question : 2 (A)	Answer The Following Question	(Only Three)	03
Question : 2 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 2 (C)	Answer The Following Question	(Any One out of Two)	05

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**Unit : 03**

Question : 3 (A)	Answer The Following Question	(Only Three)	03
Question : 3 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 3 (C)	Answer The Following Question	(Any One out of Two)	05

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**Unit : 04**

Question : 4 (A)	Answer The Following Question	(Only Three)	03
Question : 4 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 4 (C)	Answer The Following Question	(Any One out of Two)	05

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**Unit : 05**

Question : 5 (A)	Answer The Following Question	(Only Three)	03
Question : 5 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 5 (C)	Answer The Following Question	(Any One out of Two)	05