CSE3181: Introduction to Mobile Application Development

Programme: B.Tech (CSE) Year: III Semester: 5
Course: Program Elective Credits: 3 Hours: 40

Course Context and Overview (100 words):

With the digital breakthrough, smart phones have become very essential component for many routine tasks like shopping, paying bills, transferring money, instant messaging, emails, etc. This course aims at imparting knowledge of fundamentals of mobile application development, and associated tools for porting these applications to a real device. Ignoring security aspects of the app development exposes users and their devices to hackers, therefore, the course shall aim to safe programming practices for app development. Android being the most popular mobile operating system and an open source, it will be used as platform for mobile application development in assignments, project as well as in classroom hands-on sessions.

Prerequisite Courses: Computer Programming.

Course outcomes (COs):

On completion of this course, the students will have the ability to:
CO1: Design and develop mobile applications.
CO2: Port applications to devices and execute them.
CO3: Participate in real-world app development (banking app, e-commerce app, gaming app etc.) as minor project.
CO4: Conceptualize the notion of safe mobile applications.

Course Topics:

Contents	Lecture Hours	Unit Hours
UNIT – 1: Introduction to Mobile Application Programming		8
1. Introduction to different Mobile OS platforms	2	
2. Installation of tools to design apps (IDE, SDK, Emulator etc.)	1	
3. Creating First Application	1	

4. File Organization, Virtual machine Management and Debug Projects	3	
5. Porting apps to emulator and real devices	1	
UNIT - 2: Communication Mechanism for Mobile Applications		7
1. Overview of Intents	1	
2. Component Linking	2	
3. Intent Resolution and Filtering	1	
4. Intra and Inter App Data Communication	1	
5. Concurrent Programming with Intent	2	
UNIT-3: Android Components		12
1. Android Activities	1	
2. Activity Lifecycle Operations	1	
3. Managing Multiple Activities and Task	2	
4. Android Broadcast Receivers	1	
5. Registering, Implementing and Invoking Broadcast Receivers	2	
6. Establishing Communication between a Broadcast Receiver and an Activity	1	
7. Android Services	1	
8. Service Lifecycle Operations	1	
9. Service Deployment and Communication Model	2	
UNIT-4: Persistence Data		8
1. Saving and Loading User Preferences	1	
2. Persisting Data to External Storage (Files, SD-Card)	1	
3. Overview of Content Provider and Content Resolver	2	
4. Overview of SQLite	2	
5. Sharing Data using a Content Provider	2	
UNIT-5: Safe Programming Practices for Mobile Applications		5
1. Android Components Security	2	

2. Case Study: Privacy Leakage through single and multiple Android Applications	3	

Reference books:

1. Joseph Annuzzi, Lauren Darcey, and Shane Conder. "*Introduction to Android Application Development": Android Essentials*, 5th edition, Addison-Wesley Professional, 2016.
2. Haseman, C, "*Creating Android applications": Design and Develop*. 1st ed. Berkeley, Calif.: Peachpit, 2012.
3. Fling, B, "*Mobile Design and Development",* 1st edition. Sebastopol, O'Reilly Media, Inc, 2009.
4. Deitel, P., Deitel, H. and Deitel, A, "*Android 6 for Programmers": An App-Driven Approach*, 3rd edition, Pearson Education, 2015.

Additional Resources (Video Lectures, Web resources etc.):

1. Android development page: http://developer.android.com/index.html [Accessed on: 19-07-2019]

Evaluation Methods:

Component	Weightage (%)
Quiz 1	10
Quiz 2	10
Lab Exam	20
Project	30
End Term Examination	30

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