Certificate/Diploma in Mobile Application Development

Objective of the Course:

The Programme aims at providing a holistic knowledge to the learners about the architectures of Mobile Applications using Andriod, IOS design and implementation of databases for user requirements, and developing mobile apps using Android. Any person who is interested in developing mobile apps and has knowledge of Computer programming and database can join this programme. This Programme is available in certificate and diploma forms, candidates will get certification after six months and diploma will be issued to students who wish to continue this course for a duration of 1 year.

Duration of the Course:

1) Certificate course: 6 months
2) Diploma:12 months

Eligibility: Any student enrolled in the degree program of the college and having knowledge about the basics of Computers.

Sr. No.	Topics	
Topics covered under Certificate Course are Sr No.1, 2 and 3		
1	CCMAD-01T Introduction Mobile Architecture	Credits: 6
2	CCMAD-02T Programming Using Java CCMAD-02P Programming Using Java Lab	Credits: 6(4 Th. 2 Lab)
3	CCMAD-03T Introduction to Android CCMAD-03P Introduction to Android Lab	Credits: 6(4Th. 2 Lab)
Topics covered under Diploma Course are Sr No. 1, 2, 3, 4, 5 and 6		
4	DMAD-04T Introduction to Window Mobile and IOS DMAD-04P Introduction to Window Mobile and IOS Lab	Credits: 6 (4Th. 2 Lab)
5	DMAD-05T Image Design and Animation	Credits: 6
6	DMAD-06T Introduction to Database DMAD-06P Introduction to Database Lab	Credits: 6 (4Th. 2 Lab)

I. INTRODUCTION TO MOBILE ARCHITECTURE (CREDITS:6)

Section-A

Unit I: Introduction to Mobile App, Objectives of Mobile App, Considerations and Challenges for Mobile App, PC Based Applications, Web Based Applications, Evolution of Mobile Based Apps, Comparison of Mobile App with Web Application, Content and Protocol in Mobility, Trends in Mobility Space, Mobile App Platforms

Unit II: Components of a Mobile Application: Architecture of a Mobile Application, Architecture of a native Mobile App, Architecture of a hybrid Mobile App, Architecture of a Mobile Web App, Components of a Mobile Client Application, Components of Mobile Support Infrastructure, End to End Case Study of Android Mobile Architecture, Basics of Mobile Application Design: Design Considerations, User Interface Design for Mobile Apps, Deployment, Power Usage, Synchronization, Patterns and Design Elements, Security Standards and Best Practices, Mobile App Testing

Unit III: Introduction to Mobile Operating Systems: Basic Functions of an Operating System, Mobile Operating Systems: Layer 0, Layer 1, Layer 2, Architecture of Android, Knowing the Operating System of a Mobile Phone, Discontinued Mobile Operating Systems, Existing Mobile Operating Systems, Types of Mobile Operating Systems, Basics of Android: Objectives, Interface, Applications, Memory Management, Virtual Reality

Unit IV: Basics of iOS: Objectives , Accessibility, Multitasking, Siri, Setting up Siri, Launching Siri , Game Center, Basics of Windows Mobile: Evolution of Windows Phone, Features of Windows Phone, Virtual Private Networking, Windows Phone 7, Windows Phone , Windows 10 Mobile

Section-B

Unit V: Mobile Processors, ARM Processors, Features of ARM processor, ARM architecture, x86 Processors, Basic Design of x86 Processor, Instruction Execution Cycle, Differences Between x86 and ARM Processors, Memory in a Mobile Phone: Volatile Memory, Non-Volatile Memory, Memory Card, ROM, Flash Memory, Differences between NOR and NAND flash memories

Unit VI: Sensors: Gyroscope, Accelerometer, Types of Accelerometer, Specification of an Accelerometer, Output of an Accelerometer, Applications of an Accelerometer, Compass, Proximity Sensor, Input-Output: Display, Camera, Speakers, Active Speakers, Passive Speakers, Microphones, Types of Microphones, Native Development Tools: Native Development Tools: Development Tools for Android, Android Studio, Eclipse IDE, Development Tools for iOS, Xcode, Swift, Development Tools for Windows Based Mobiles, C#, XAML

Unit VII: Various Approaches for Cross Platform Mobile App Development: Web Based Cross Platform Mobile App Developm ent, Hybrid Approach for Cross Platform Mobile Ap p Development, Single Language Approach for Cross Platform Mobile App Development, Mobile Middleware Approach for Cross Platform Development, Xamarin, Xamarin.Android, Xamarin.iOS, Phone Gap, Developing an Android App in Phone Gap, Developing an iOS App in Phone Gap, Advantages and Disadvantages of Cross Platform Mobile App Development Tools

Unit VIII: Google Play Store, Prerequisites for Publishing Android Apps to Google Play Store, Apple App Store, Prerequisites for Publishing Apps to Apple App Store, Windows Store: Pre-requisites for Publishing Apps to Windows Store, Monetizing Android Apps: Freemium Distribution Model, Paid Distribution Model, Affiliate Partnership Model, Commission Model, White Labeling Model, Publishing to Amazon App Store, Monetizing iOS Apps, Monetizing Windows Apps, Choosing Right Mobile Ad Strategy, Defining the Success Metrics, Mobile Ad Selection Based on Business Strategy, Monitor Ads

I. PROGRAMMING USING JAVA (CREDITS:4)

Section - A

History and Evolution of Java, Data Types, Variables and Arrays, Operators, Control Statements, Introducing Classes, A Closer Look at Methods and Classes.

Inheritance: Basics, Using super, Creating Multilevel Hierarchy, Method Overriding, Dynamic Method Dispatch, Using Abstract Classes, Using final with inheritance, The object Class. Packages and Interfaces: Defining a package, Finding packages and CLASSPATH, Access Protection, Importing Packages, Defining an Interface, Implementing Interface, Nested Interface, Applying Interface, Variables in Interfaces, Exception Interface: Fundamentals, Exception Types, Uncaught Exceptions, Using try and catch, Multiple catch clauses, Nested try Statements, throw, throws, finally, Java's inbuilt Exceptions, Creating own Exception Subclasses, Chained Exceptions, Using Exceptions, Multithreaded Programme: The java Thread Model, The Main Thread, Creating a thread, Creating Multiple Threads, Using is Alive() and join (), Thread Priorities, Synchronization, Inter thread Communication, Suspending, Resuming, and Stopping Threads, Using Multithreading.

Section - B

I/O Basics: Streams, Byte Streams, Character Streams, The Predefined Streams, Reading Console Input, Writing Console Output, The Print Writer Class, Reading and writing files, Applet Fundamentals, The Transient and volatile Modifiers, Using Instance of, Static Import, Invoking Overloaded constructors Through this().

Introduction to Swing, Event handling, String Handling, Primitive Type Wrappers, Java and Database: JDBC Basics, SQL Package in Java, Working with database, Creation of JDBC Statements, Networking in Java: Basics

Getting Started with Java, Java as a Platform Independent Language, Java SE, Java EE, Java ME

Installing the Java Development Kit (JDK), System Requirement, Microsoft Windows, Apple Mac OS X

Basic Syntax, First Java Program, Selection, Decision & Repetition, The If Statement & If-Else Statement

Objects and Classes, Controlling Access to Members, Polymorphism

PROGRAMMING USING JAVA LAB (CREDITS:2)

The programs in lab will be based on the contents covered in the theory syllabus.

I. INTRODUCTION TO ANDROID (CREDITS:4)

Section-A

Unit I: Introduction to Android: Android as a popular mobile platform, History of Android, Evolution of Android, Features of Android, Comparison of mobile Operating systems, Devices that run Android as the Operating System, Categories of Android applications

Android Architecture: Introduction, Android Architecture, Android Architecture, Types of mobile applications, Application Fundamentals

Unit II: Activity lifecycle: Introduction, What is an Activity in Android?, Android Application Fundamentals, What are the Android process states?

Android Development Environment: Introduction, Reasons for Android Development, Android Development Platforms, Features and Tools, Configuring Android Development Environment, Setting Up Android Development Environment, Install Android for Windows 10

*Unit III:*Android application fundamentals: Introduction, Basic App Components, Android Development, Additional Components, Resources, Android Manifest, File conventions, Android Development: Introduction, Creating Your First Program, Building and running the application

Device Compatibility: Introduction, Application availability to devices, Device Features, Platform Version, Screen Configuration, Device Compatibility

Unit IV: User Interface Design: Introduction, UI Overview, User Interface Layout, Creating GUI for Android Application, Input Controls, Fundamentals of designing user interfaces using XML, Design a UI with Layout Editor, Managing Touch Events in a ViewGroup, Best Practices for User Interface

Testing and Debugging:What is Testing? Types of Testing, How to test Android application?, , How to test Android Application?, Test Suite, What is Debugging? What is Logcat?

Section-B

Unit V: Integrating Multimedia: Introduction to Multimedia, Audio and video integration into Android Application Development, Multimedia for Android Interactive Application Development, Camera functions in Android Application Development, Supported Media Formats, Saving Data on Android Devices: Android Storage Options, Shared Preferences, Internal Storage, External Storage, Saving data in SQLite databases

Unit VI: Locating and Sensing: Introduction to Sensors, Android Sensor Framework, Identifying Sensors and Sensor Capabilities, Monitoring Sensor Events, Sensor Coordinate System, Best Practices for Accessing and Using Sensors, Commonly Used Sensors, Making Your App

Location Aware, Getting the Last Known Location, Changing Location Settings, Receiving Location Updates, Adding Google Maps to Your App

Unit VII: Connectivity and the cloud: Connecting devices wirelessly, Performing network operations, Considerations when transferring data, Syncing to the cloud with information delivery models, Push Notification, Publish to Android Market: How can you obtain an Android Application? App Stores, Revenue Models, Google Play, Process of Publishing an Android Application

Unit VIII: Performance Profiling, Android Monitor Overview, Android Monitor Basics, Profiling a Running App in Android Monitor, How Android Manages Memory, Battery Analysis, Optimizing Battery Analysis, Security: Security Concerns of an Android Application, Security Provided by the OS, Information Leakage, Device Management Policies

INTRODUCTION TO ANDROID LAB (CREDITS:2)

The programs in lab will be based on the contents covered in the theory syllabus

I. INTRODUCTION TO WINDOWS MOBILE AND IOS (CREDITS:4)

Section-A

Unit I: Development Environment: Introduction to Visual Studio, Advantages of Using Visual Studio, Setting Up Development Environment, Hello World- First Windows App, Simulators in Windows, Emulators and Debugger

User Interface for Windows Mobile: Introduction to Universal Windows Platform (UWP), Extensible Application Markup Language (XAML), UI Controls, Button, Textbox, Checkbox, Toggle Switch

Unit II: Introduction to C#:Net Framework, C# (C Sharp), Basics of C# language, Keywords, Variable and Datatypes, Operators, Control Statements, Introduction to Classes, Methods, Properties, Constructors and Destructors, Model View Controller (MVC)

Windows Mobile: Layout Controllers and Model, Layout Panels, Navigation Panel, Gesture Control, List of other Controls, Storage in Windows Mobile: Introduction to SQLite, Features of SQLite, Usages and Application of SQLite, Basic Syntax of SQLite

Unit III: Integrating with Web Services in Windows Mobile: Web Services in ASP.NET, Building the Web Services, Discovering and Manipulating a Device, Functions, Multi-Threading in Windows Mobile: Drawbacks of Multi-Threading, Thread Synchronization, UI Threads

Unit IV: Interaction with Camera in Windows Mobile: Introduction to Camera, Evolution of Camera, Types of Camera, Introduction with Hardware, Hardware Limits, Features of a Windows Camera, Windows Phone Camera: Scenes and Effects, Image Capturing, Focusing and Composing the Scenes, Controlling the Light Entering the Camera, Differences between Windows Camera and Others

Development Environment: Introduction to Xcode, Advantages of Xcode, Disadvantages of Xcode, Setting Up Development Environment, Simulators in iOS, Debugger

Section-B

Unit V: User Interface for iOS: Objectives, Introduction to Auto Layout, Introduction to Storyboarding, UI Controls , Introduction to Swift: Introduction to MVC, Objective C vs Swift, Coexistence of Objective C and Swift, Check-in Progress, Playground, Basics of swift, Check-in Progress

iOS Controllers and Model: Top Label Panels (Table Panel, Scroll, etc.), Navigation Controllers, Gesture Handing, Model

Unit VI: Storage in iOS: Introduction, User Defaults /SQLite/Core Data, Usages and Application of Core Data , Integrating with Web Services in iOS: Data Consumption, Functions, Multi-

Threading in iOS: Categories of Thread, Multithreading Models, Thread Synchronization, UI Threats, Background Threads

Interaction with Camera in iOS: Introduction to Camera, Interaction with Camera Hardware, Image Capturing

INTRODUCTION TO WINDOWS MOBILE AND IOS LAB (CREDITS:2)

The programs in lab will be based on the contents covered in the theory syllabus.

MOBILE APPLICATION DEVELOPMENT
SEMESTER - II
DMAD-05T: IMAGE DESIGN AND ANIMATION

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 6
Pass Percentage: 40%

Objective:
Objective of this paper is to equip with skills of Image Designing & Animation, Image Designing in various domains and specifications.

Section-A

Unit I: Introduction to Image and Design, Image Design, Image Processing, Raster and Vectors, Elements and Principles of Design, Image Design, Principles of Design.

Unit II: Image Creation and Manipulation, Color Theory, Images Editing, Understanding Image Size and Resolutions, Creating Images for Print and Web, File Format & DPI Guide, Image Formats.

Unit III: Image Design Software, Drawing, Painting, Image Manipulation and Photo Editing Software, Introduction to Basics Tools in Image Design Software Interface, Drawing, Colouring and Editing of Basics Shapes, Introduction to Creation of Professional Image Design.

Section-B

Unit IV: Image Animation: Introduction, The Uses of Animation, Cartoons, Simulations, Scientific Visualization, Principles of Animation, Traditional animation, Stop Motion, Computer Animation.

Unit V: Dynamics of Computer Animation: Keyframing, Motion Capture, Techniques to Aid Motion Specification, Model Based Animation, Animation Production.

Unit VI: Animation Technology and Hardware: Film Technology, Video Technology, Animation Hardware, Animation Rendering, and Output Techniques, Animation Software: Maya, Inkscape.

I. INTRODUCTION TO DATABASES (CREDITS:4)

Section-A

Unit I: Introduction to Database Systems: Databases , Characteristics of a Database, Functions of a Database, Database Usage and Environment, Database Users, Classification of DBMSs, Database Administrator, Database History, Before the Advent of Databases, Database Approach, Data Modelling, Database Architecture Levels (Views), Data Abstraction Layer, Schema, Data Independence,

Unit II: Data Models, Types of Data Models, Relational Data Model, Fundamental Concepts in Relational Model, Entity Relationship Model, Integrity Rules and Constraints, Business Rules, Relationship Types, Relational Design and Redundancy, Data Redundancy, Data Anomalies, How to Avoid Anomalies

Unit III: Normalization: Functional Dependencies, Rules of Functional Dependencies, Dependency Diagram,Normal Forms, Database Design

Section -B

Unit IV: Transaction Processing Systems: Batch, On-line, Real time, Transaction ACID Properties.Database Protection: Security Issues, Discretionary Access Control-Granting and Revoking Privileges.

Unit V: Database Concurrency: Problems of Concurrent Databases, Serializability and Recoverability, Concurrency Control Methods-Two Phase Locking, Time Stamping. Database Recovery: Recovery Concepts, Recovery Techniques-Deferred Update, Immediate Update, Shadow Paging.

Unit VI: Introduction to SQL: Data Definition Language (DDL) Commands, Table Constraints, User Defined Types, Data manipulation Language (DML) Commands, INSERT Statement, SELECT Statement, Where Clause, Special Operators, AND /OR Operators, SQL Aggregate Functions, Order By Clause, Group By Clause, Data control Language (DCL), Applying Integrity Constraints. Functions, Procedures and Packages. Using Cursors and Triggers, SQL

Join Statements:Inner Joins, Outer Joins, Database Development Process, Software Development Life Cycle (SDLC), Database Life Cycle

INTRODUCTION TO DATABASES LAB (CREDITS:2)

The programs in lab will be based on the contents covered in the theory syllabus.