BE ¾ (CSE) I-Semester ELECTIVE –II Courses

16CSE04

MOBILE APPLICATION DEVELOPMENT

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course Objectives

1. Understand J2ME and Android architecture and solve problems with J2ME, Android application
2. Design, implement and evaluate a User Interface for a mobile application.
3. Understand how to create working mobile application for small computing devices using Android.
4. Understand to manage repository of data information for mobile application
5. Categories the challenges posed by developing mobile applications and able to propose and evaluate and select appropriate solutions.

Course Outcomes

1. Ability to evaluate and select appropriate solutions to the mobile computing platform.
2. Ability to develop the user interface.
3. Ability to develop database management system to retrieve data for mobile application
4. Ability to build a simple mobile application.
5. Develop and Deploy mobile applications

UNIT- I

Developing for Mobile and Embedded Devices, J2ME Overview: Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices.

J2ME Architecture and Development Environment: J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MiDlet Programming, J2ME Software Development Kits, Multiple MlDlets in a MIDlet Suite.

UNIT-II

Commands, Items, and Event Processing: J2ME User Interfaces, Display Class, Command Class, Item Class, Exception Handling

Record Management System: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener

UNIT- III

Generic Connection Framework: The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process

Android: An Open Platform for Mobile Development, A Little Background, Native Android Applications, Android SDK Features, Developing for Android, Android Development Tools

UNIT- IV

Creating Applications and Activities: Introducing the Application Manifest File, Externalizing Resources, The Android Application Lifecycle, A Closer Look at Android Activities,

Building User Interfaces: Fundamental Android UI Design, Android User Interface Fundamentals, Introducing Layouts

UNIT- V

Databases and Content Providers: Introducing Android Databases, Working with SQLite Databases, Creating Content Providers, Using Content Providers, Adding Search to Your Application

Text Books:

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill, 2017.
2. Professional Android Application Development, Reto Meier, Wiley India, 2012.

Suggested Reading:

1. Mobile Design and Development, Brian Fling, O'Reilly, SPD, 2011.
2. Beginning Android Application Development, Wei-Meng Lee, Wiley Publishing, Inc, 2012
3. Android a Programming Guide, Jerome(J.F.) DiMarzio, McGrawHill, 2010
4. https://onlinecourses.nptel.ac.in/noc16_cs13
5. https://developer.android.com/index.html

16CSE05

COMPUTER GRAPHICS

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course Objectives:

1. To Identify and explain the core concepts.
2. To Acquire knowledge about device level algorithms for displaying two dimensional output primitives for raster graphics system.
3. To Acquire knowledge about the basic concepts of representing 3D objects in 2D.
4. To Introduce computer graphics techniques transformations, clipping, curves and surfaces.

Course Outcomes:

1. Review the core concepts of computer graphics.
2. Analyse graphics techniques for rasterization, clipping, curve generation etc.
3. Evaluate pictures using various algorithms.
4. Understand the pipeline of typical graphics
5. Interpret and apply relevant problem solving methodologies

Prerequisites:

Knowledge of Linear Algebra (vectors and matrices), Good programming skills

UNIT-I

Graphics Systems and Models: Graphics system; Images; Physical and synthetic; Imaging system; synthetic camera model; programming interface ; graphics architectures programmable pipelines; performance characteristics.

Graphics Programming: Programming two-dimensional applications; OpenGL API; Primitives and attributes; color; viewing, control functions

UNIT-II

Input and Interaction: Input device; clients and servers; displays lists; display lists and modeling; programming event driven input; picking ; building interactive models; animating Interactive programs; logic operations.

Geometrics Objects: Three - dimensional primitives; coordinates systems and frames; frames in OpenGL; Modeling colored cube.

UNIT-III

Transformations: Affine Transformations; Transformations in homogenous coordinates; concatenation of Transformations; OpenGL transformation matrices; **Viewing:** Classical and Computer views; Viewing with a computer; Positioning of camera; Simple projections; Projections in OpenGL; Hidden surface removal; Parallel-projection matrices; Perspective projection matrices

UNIT-IV

Lighting and Shading: Light sources; The Phong lighting model; Computational vectors; Polygonal shading; Light sources in OpenGL; Specification of matrices in OpenGL; Global illumination;

From Vertices To Frames: Basic implementation strategies; line-segment clipping; polygon clipping; clipping of other primitives; clipping in three dimensions; Rasterization ; Bresenham's algorithm; Polygon Rasterization ; Hidden surface removal; anti-aliasing; display considerations.

UNIT-V

Modelling & Hierarchy: Hierarchal models; trees and traversal; use of tree data structure; animation; Graphical objects; Scene graphs; Simple scene graph API; Open Scene graph; other tree structures;

Curves and Surfaces: Representation of curves and surfaces; design criteria; Bezier curves and surfaces; Cubic B-splines; General B-splines; rendering curves and surfaces; curves and surfaces in OpenGL.

Text Books:

1. Edward Angel ,Computer Graphics A Top-Down Approach with shader based openGL, Peasrson Education, 6th edition -2011.
2. Hearn Donald, Pauline Baker M: Computer Graphics with openGL, 4th edition , Prentice Hall PTR, 2010.
3. **Fransis S Hill Jr., Stephen M Kelley, Computer Graphics Using OpenGL, Prentice**-Hall Inc., 3rd edition , 2007.

Suggested Reading & Online Resources:

1. Edward Angel ,Computer Graphics A Top-Down Approach using openGL, Peasrson Education, 5th edition -2009.
2. Jim X. Chen, Foundation of 3D Graphics Programming Using JOGL and Java3D, Springe Verlag, 2006.
3. Hearn Donald, Pauline Baker M: Computer Graphics, 2nd edition , Prentice Hall PTR, 1995.
4. http://nptel.ac.in/courses/106106090/
5. http://nptel.ac.in/courses/106102065/

16CSE06

ADVANCED COMPUTER ARCHITECTURE

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course objectives:

1. To provide concepts on performance measurement of processor architectures
2. To provide knowledge about the need of parallel processing
3. To provide basics about parallelism techniques implemented in uniprocessor technologies.
4. To gain knowledge of state-of-the art technologies like superscalar and vector processor
5. To gain knowledge on multiprocessor and multi-core technologies.

Course Outcomes:

1. Acquire skills to measure the performance of various processor architectures
2. Apply parallel processing techniques
3. Gain knowledge on parallelism techniques implemented in uniprocessor technologies.
4. Understand the state-of-the art technologies like superscalar and vector processor
5. Gain knowledge multiprocessor and multi-core technologies.
6. Understand the parallel program development.

UNIT-I

Measuring Performance and cost: Performance measurement, Enhancements to Uniprocesssor models, Benchmarks, Basic model of advanced computer architectures.

UNIT-II

Pipelining and superscalar techniques: Basic pipelining, data and control hazards, Dynamic instruction scheduling, Branch prediction techniques, Performance evaluation, Case study- Sun Microsystems - Microprocessor.

UNIT-III

Vector Processors: Vector Processor Models, Vector architecture and Design, Performance evaluation, and Programming Vector processors.

Array Processors: Parallel array processor model, and Memory organization Interconnection networks: performance measures, static and dynamic topologies

UNIT-IV

Multiprocessors and Multi computers: Multiprocessor models, Shared-memory and Distributed memory architectures, Memory organization, Cache Coherence and Synchronization Mechanisms, Parallel computer, and Performance models.

UNIT-V

Software for parallel Programming: Parallel models, languages, and compilers, Parallel Program Development and Environments, and Trends in Parallel systems- Heterogeneous Computing multi-core architectures, and Asymmetric multi-core architectures.

Text Books:

1. John L. Hennessey and David A. Patterson , “Computer Architecture, A Quantitative Approach “, 4 th Edition, Elsevier, 2007.

Suggested Reading:

1. Sajjan G. Shiva, “Advance Computer Architecture “, Taylor Series Group, CRC press, 2006.
2. Kai Hwang and Naresh Jotwani, “Advanced Computer Architecture”, Mc Graw Hill, 1999.