

Veer Narmad South Gujarat University, Surat
M.C.A (4th Semester)
Syllabus Effective from: July 2013
Paper: 401-Mobile Application Programming

Objective: Familiarize students with Operating Systems for Mobile devices impart skills for Mobile Application Development

Prerequisites: Basic concepts of Operating Systems, Programming skills in core Java

1. An Introduction to Mobile Computing

- 1.1 What is mobile Application Programming?
- 1.2 Different Platforms

2. Operating systems

- 2.1 Architecture and working of Android, iOS and Windows phone 8 operating system
- 2.2 Comparison of Android, iOS and Windows phone 8

3. Android Development Environment

- 3.1 What Is Android?
- 3.2 Advantages and Future of Android
- 3.3 Tools and about Android SDK
- 3.4 Installing Java, Eclipse, and Android
- 3.5 Android Software Development Kit for Eclipse
- 3.6 Android Development Tool: Android Tools for Eclipse
- 3.7 AVDs: Smartphone Emulators
- 3.8 Image Editing

4. Android Software Development Platform

- 4.1 Understanding Java SE and the Dalvik Virtual Machine
- 4.2 The Directory Structure of an Android Project
- 4.3 Common Default Resources Folders
- 4.4 The Values Folder
- 4.5 Leveraging Android XML
- 4.6 Screen Sizes
- 4.7 Launching Your Application: The AndroidManifest.xml File
- 4.8 Creating Your First Android Application

5. Android Framework Overview

- 5.1 The Foundation of OOP:
- 5.2 The APK File
- 5.3 Android Application Components
- 5.4 Android Activities: Defining the UI
- 5.5 Android Services: Processing in the Background
- 5.6 Broadcast Receivers: Announcements and Notifications
- 5.7 Content Providers: Data Management
- 5.8 Android Intent Objects: Messaging for Components
- 5.9 Android Manifest XML: Declaring Your Components

6. Views and Layouts

7. Buttons, Menus, and Dialogs

8. Graphics Resources in Android

- 8.1 Introducing the Drawables
- 8.2. Implementing Images
- 8.3. Core Drawable Subclasses
- 8.4. Using Bitmap, PNG , JPEG and GIF Images in Android
- 8.5. Creating Animation in Android

9. Handling UI Events

- 9.1. An Overview of UI Events in Android
- 9.2. Listening for and Handling Events
- 9.3. Handling UI Events via the View Class
- 9.4. Event Callback Methods
- 9.5. Handling Click Events
- 9.6. Touchscreen Events
- 9.7. Keyboard Events
- 9.8. Context Menus
- 9.9. Controlling the Focus

10. Content Providers

- 10.1 An Overview of Android Content Providers
- 10.2 Defining a Content Provider
- 10.3 Working with a Database

11. Intents and Intent Filters

- 11.1 What Is an Intent?
- 11.2 Implicit Intents and Explicit Intents
- 11.3 Intents with Activities
- 11.4 Intents with Broadcast Receivers

12. Advanced Android

13. New Features in Android 4.2

14. iOS Development Environment

- 14.1. Overview of iOS
- 14.2. iOS Layers
- 14.3 Introduction to iOS application development

15. Windows phone Environment

- 15.1 Overview of windows phone and its platform
- 15.2 Building windows phone application

Self Study :

Use of DBMS on Mobile Devices.

References:

- | | | | |
|---|-----------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------|
| 1 | Beginning Android 4 | Onur Cinar | Apress Publication |
| 2 | Professional Android 4 Application Development | Reto Meier | Wrox |
| 3 | Beginning iOS 6 Development: Exploring the iOS SDK | David Mark | Apress |
| 4 | Beginning Windows 8 Application Development | István Novák, Zoltan Arvai, György Balássy and David Fulop | - |
| 5 | Professional Windows 8 Programming: Application Development with C# and XML | Allen Sanders and Kevin Ashley | Wrox Publication |

Veer Narmad South Gujarat University, Surat
M.C.A (4th Semester)
Syllabus Effective from: July 2013
Paper: 402-Information Systems

Objective: Learn in depth, the different types of Information Systems

Prerequisites: None

1. Information System in Enterprise

- 1.1 System Applications in the Organization
 - 1.1.1 Kinds of Information Systems
 - 1.1.2 Types of Information Systems
 - 1.1.3 Relationship of systems with one another
- 1.2 MIS Development Process
- 1.3 Functional Perspective of System
 - 1.3.1 Various Information Systems like Sales and Marketing, Manufacturing and Production, Financial and Accounting, Human Resource etc.
- 1.4 Integrating Functions and Business Processes
 - 1.4.1 Business Processes and Information System
 - 1.4.2 Customer Relationship Management (CRM) and Supply Chain Management
 - 1.4.3 Enterprise Systems
 - 1.4.4 Vertical and Horizontal Industrial Networks

2. Management Information System

- 2.1 Need of Information System
 - 2.1.1 What is an Information System?
 - 2.1.2 Competitive Business Environment
 - 2.1.3 A Business Perspective on Information Systems
- 2.2 Approaches to Information Systems
 - 2.2.1 Technical Approach
 - 2.2.2 Behavioral Approach
 - 2.2.3 Socio-technical Systems
- 2.3 The role of Information System
 - 2.3.1 Scope of Information System
 - 2.3.2 Organizational Design
 - 2.3.3 Electronic Commerce and Electronic Business
- 2.4 Use of Information System
 - 2.4.1 Challenge of Information Systems

3. Information System, Organizations, Management and Strategy

- 3.1 Relationship of an Organization with Information System
 - 3.1.1 What is an Organization?
 - 3.1.2 Features of Organization
- 3.2 Role of Information System in Organizations
 - 3.2.1 How Information System affect Organization?
 - 3.2.2 Implications for the design and Understanding of Information System
- 3.3 Relationship of Manager, Decision Making and Information Systems
 - 3.3.1 Role of Managers in Information System
 - 3.3.2 Managers and Decision Making

- 3.4 Information System and Business Strategies
 - 3.4.1 What is Strategic Information System?
 - 3.4.2 Business Level Strategy and Value Chain Model
 - 3.4.3 Supply Chain Management and Efficient Customer Response system

4. Electronic Commerce and Electronic Business

- 4.1 Emerging Trends
 - 4.1.1 New Business Models
- 4.2 Electronic Commerce
- 4.3 Electronic Commerce Payment Systems
- 4.4 Electronic Business and Digital Firm
- 4.5 Challenges and Opportunities of E-Commerce

5. Knowledge Based Systems

- 5.1 Knowledge Management in Organization
 - 5.1.1 System and Information of Knowledge Management
 - 5.1.2 Knowledge Work and Productivity
- 5.2 Information and Knowledge Work System
 - 5.2.1 Office and Document Management System
 - 5.2.2 Creating Knowledge Work System
 - 5.2.3 Group Collaboration System
- 5.3 Use of Artificial Intelligence in Business

6. Decision Making

- 6.1 Decision Support System (DSS)
 - 6.1.1 Relationship of MIS and DSS
 - 6.1.2 Types of Decision Support System
 - 6.1.3 Components of Decision Support System
 - 6.1.4 Decision Support System Applications
- 6.2 Group Decision Support System (GDSS)
 - 6.2.1 What is Group Decision Support System
 - 6.2.2 Characteristics of Group Decision Support System
 - 6.2.3 Importance of Group Decision Support System
- 6.3 Executive Support System (ESS)
 - 6.3.1 Role of Executive Support System
 - 6.3.2 Development of Executive Support System
 - 6.3.3 Advantage of Executive Support System

7. Control and Security of Information System

- 7.1 Threats to Information Systems
- 7.2 System Quality Problems
 - 7.2.1 Software and Data Quality Problems
- 7.3 Control Environment
 - 7.3.1 General Controls and Application Controls
 - 7.3.2 Security issue on E-Commerce
 - 7.3.3 Control Structure Development

Self Study :

Business Process Re-engineering

References:

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|---|-----------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------|
| 1 | Management Information System : Managing A Digital Firm – 9 th Ed. | Kenneth C. Laudon & Jane P. Laudon | Pearson Education, Second Indian Reprint 2004 |
| 2 | Principles of Information Systems – A Managerial Approach, 9 th Ed. | Ralph M. Stair & George W. Reynolds, Course Technology | Cengage Learning, 2010 |
| 3 | Management Information system | W.S. Jawadekar | Tata McGraw-Hill |
| 4 | Information Systems Management In Practice, Sixth Edition | B.C. McNurlin, R.H. Sprague | Pearson Education |
| 5 | Information Systems for Modern Management | Murdick, Ross and Claget, Prentice Hall | - |

Veer Narmad South Gujarat University, Surat
M.C.A (4th Semester)
Syllabus Effective from: July 2013
Paper: 403-Data Communication and Network Protocols

Objective: Learn Advanced concepts of Network Protocols and Data Communication

Prerequisites: Concepts of Computer Networks

1. Introduction

- 1.1 Review of ISO OSI reference model
- 1.2 Introduction to TCP/IP protocol suite
- 1.3 Introduction to internet and its administration

2. IP addressing and routing

- 2.1 Class full addressing
- 2.2 Class less addressing
- 2.3 Delivery, forwarding and routing of IP packets

3. IP protocol

- 3.1 Introduction
- 3.2 Datagram
- 3.3 Fragmentation
- 3.4 Options
- 3.5 Checksum
- 3.6 Utilities

4. ARP and RARP

- 4.1 Introduction
- 4.2 ARP, RARP Packet formats
- 4.3 ARP, RARP Encapsulation
- 4.4 Operation
- 4.5 Proxy ARP
- 4.6 RARP server

5. ICMP

- 5.1 Introduction
- 5.2 Message Types
- 5.3 Message format
- 5.4 Error reporting
- 5.5 Query
- 5.6 Checksum
- 5.7 Debugging tools

6. UDP

- 6.1 Introduction
- 6.2 User datagram
- 6.3 Checksum
- 6.4 Operation
- 6.5 UDP usage

7. TCP

- 7.1 Services
- 7.2 Features
- 7.3 Segment
- 7.4 Connection
- 7.5 State transition diagram
- 7.6 Flow control
- 7.7 Error control
- 7.8 Congestion control
- 7.9 TCP timers
- 7.10 Options

8. DNS

- 8.1 Domain Name space and distribution
- 8.2 DNS in Internet
- 8.3 Resolution
- 8.4 DNS messages
- 8.5 Record types
- 8.6 Compression
- 8.7 DDNS
- 8.8 Encapsulation

9. Introduction to

- 9.1 Unicast routing protocols RIP, OSPF, BGP
- 9.2 Multicast protocol: IGMP
- 9.3 Stream Control Transmission protocol (SCTP)
- 9.4 Host configuration: BOOTP & DHCP
- 9.5 Remote Login: TELNET
- 9.6 File Transfer: FTP, TFTP
- 9.7 Electronic Mail: SMTP, POP, IMAP
- 9.8 Network Management: SNMP

Self study:

Study of IP next generation including IPSec.

Development and demonstration of network software tools using above protocols.

References:

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|---|-------------------------------------------------|---------------------|------------------|
| 1 | TCP/P Protocol Suite 3rd edition | Behrouz A. Forouzan | Tata McGraw Hill |
| 2 | TCP/IP Illustrated Vol. – 1&2, | W. Richard Stevens | - |
| 3 | Data and Network Communication | M.A. Miller | Thomson Learning |
| 4 | Data Communication and Networks | A.S. Godbole | Tata MCGraw Hill |
| 5 | Introduction to Data Communication & Networking | Wayne Tomasi | Pearson Ed. |

Veer Narmad South Gujarat University, Surat
M.C.A (4th Semester)
Syllabus Effective from: July 2013
Paper: 404-Interactive Computer Graphics

Objective: Learn basic graphics concepts, algorithms and its application using programming language

Prerequisites: Programming skills

1. Introduction to Computer Graphics

- 1.1 Image Processing as Picture Analysis
- 1.2 Advantages of Computer Graphics
- 1.3 Applications of Computer Graphics
- 1.4 Basic Input and Output Technology used in Interactive Computer Graphics
- 1.5 Graphics Standards

2. Display Devices

- 2.1 Hardcopy Display Devices
- 2.2 Display Technology
- 2.3 Raster-Scan Display
- 2.4 Video Controller
- 2.5 Image Scanners

3. Basic Raster Graphics Algorithms

- 3.1 Frame Buffers and Display Controllers
- 3.2 The output pipeline
- 3.3 Scan Converting Lines
 - 3.3.1 Incremental Algorithm
 - 3.3.2 Midpoint Line Algorithm
 - 3.3.3 Thick Line Drawing
- 3.4 Scan Converting Circles
 - 3.4.1 Eight-Way Symmetry
 - 3.4.2 Midpoint Circle Algorithm
- 3.5 Scan Converting Ellipses

4. Polygons

- 4.1 Polygons and its representation
- 4.2 Inside Tests
 - 4.2.1 Even-odd Method
 - 4.2.2 Winding Number Method
 - 4.2.3 Method of Index
- 4.3 Filling polygons
 - 4.3.1 Flood Fill
 - 4.3.2 Scan Line Fill
 - 4.3.3 Boundary Fill

- 4.4 Pattern Filling
- 4.5 Line Styles and Pen Style
- 4.6 Character Generation

5. Windowing and Clipping

- 5.1 Definition of Windowing and Clipping
- 5.2 Viewing Transformation
- 5.3 Point Clipping
- 5.4 Clipping Lines
 - 5.4.1 Line clipping by Solving Simultaneous Equations
 - 5.4.2 Cohen – Sutherland Line Clipping Algorithm
 - 5.4.3 Liang – Barskey Algorithm
 - 5.4.4 Midpoint Subdivision Algorithm
- 5.5 Clipping Circles and Ellipses
- 5.6 Clipping Polygons
 - 5.6.1 Sutherland Hodgman Polygon Clipping Algorithm
- 5.7 Text Clipping

6. Transformations

- 6.1 2D Transformations
- 6.2 Homogeneous Coordinated
- 6.3 Composite 2D Transformation
- 6.4 The Viewing Transformation
- 6.5 Matrix representation of 3D Transformations
- 6.6 Composite 3D Transformations
- 6.7 Transformation as a change in Coordinate System

7. Viewing in 3D

- 7.1 Projections
- 7.2 Specifying an Arbitrary 3D View
- 7.3 3D Views

8. Geometric Modeling

- 8.1 Introduction
- 8.2 Characteristics and retained mode Graphics Packages
- 8.3 Defining and Displaying Structures

9. Introduction to Illumination and Shading

10. Image Manipulation and Storage

- 10.1 Introduction to Image
- 10.2 Filtering
- 10.3 Image Processing
- 10.4 Image Composition
- 10.5 Image Storage
- 10.6 Special Effects with Image

11. Animation

- 11.1 Design of Animation Sequences
- 11.2 Key Frame Systems
 - 11.2.1 Morphing
 - 11.2.2 Simulating Acceleration
- 11.3 Motion Specifications
 - 11.3.1 Direct Motion Specification
 - 11.3.2 Goal Directed Systems

12. Introduction to OpenGL

- 12.1 Open GL Pipeline
- 12.2 Overview of OpenGL routine
 - 12.2.1 OpenGL bitmap function
 - 12.2.2 OpenGL output primitives

Self Study:

OpenGL 2D function

References:

| | | | |
|---|-----------------------------------------------------------|---------------------------------|--------------------------------------------------|
| 1 | Computer Graphics : Principles & Practice Second Ed. in C | Foley, Van Dam, Feiner, Hughes | Pearson Education, Eleventh Indian Reprint. 2004 |
| 2 | Computer Graphics | Apurva A Desai | PHI Learning, 2009 |
| 3 | Computer Graphics C Version | Donald Hearn & M. Pauline Baker | Pearson Education, Fifth Indian Reprint 2004 |
| 4 | Computer Graphics | Herrington S. Prentice Hall | - |
| 5 | Principles of Interactive Graphics | Newman & Sproul | McGraw Hill |
| 6 | Interactive Computer Graphics | Giloi W.K. Prentice Hall | - |
| 7 | Computer Graphics with Multimedia | A Rajaraman | Narosa |
| 8 | Computer Graphics with OpenGL | Hearn, Baker | Pearson, Illrd Edition |

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 405-Unix Internals & Shell Programming

Objective: Acquaint the student with the Unix Operating System, shell programming and Internals of the Unix O.S.

Prerequisites: Operating Systems, Programming Skills

1. Introduction

- 1.1 Features of UNIX
- 1.2 System Structures
- 1.3 Shell and Its Features
- 1.4 Kernel
 - 1.4.1 Architecture of the UNIX OS
 - 1.4.2 Kernel Data Structures

2. Overview

- 2.1 Logging in & out
- 2.2 Inode & File Structure
- 2.3 File System Structure & Features
- 2.4 Booting Sequence & Init process
- 2.5 File Access Permission

3. Shell Programming

- 3.1 Environment & User defined Variables
- 3.2 Argument processing
- 3.3 Shell's Interpretation at prompt
- 3.4 Arithmetic Expression Evaluation
- 3.5 Control Structures
- 3.6 Redirection
- 3.7 Background Process & Priorities of Process
- 3.8 Conditional Execution
- 3.9 Parameter & quote substitution
- 3.10 Command Evaluation & Command Grouping
- 3.11 Trapping Signals

4. Advanced Shell Programming

- 4.1 Filtering Utilities – sed
- 4.2 awk
- 4.3 Batch Processes
- 4.4 Splitting, Comparing, Sorting, Merging and Ordering Files
- 4.5 Terminals Handling
- 4.6 Communication with Other Users
- 4.7 Spooling and Print Management
- 4.8 Backup and Recovery
- 4.9 Remote Login, File Transfer & sharing

5. File System and Internal Representation

- 5.1 Structure of Buffer Pool
- 5.2 Superblock
- 5.3 Inode assignment to file
- 5.4 Reading, writing and allocation of disk blocks
- 5.5 System calls for File System

6. Process Management

- 6.1 Status and Transitions
- 6.2 Context and manipulation of process address space
- 6.3 Process creation and termination
- 6.4 Process scheduling
- 6.5 System calls for process management
- 6.6 Inter Process Communication

7. Memory Management

- 7.1 Swapping
- 7.2 Demand Paging
- 7.3 System Calls for memory management
- 7.4 Solution with semaphore

8. The I/O subsystem

- 8.1 Driver interface
- 8.2 Disk and terminal drivers
- 8.3 Streams

Self Study :

Sockets programming.

References:

- | | | | |
|---|--------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------|
| 1 | The Design of UNIX OS | M.J. Bach | Prentice Hall |
| 2 | UNIX for Super-Users | Eric Foxley | Addition Wesley Prentice Hall of India |
| 3 | The UNIX Programming Environment | Brian W. Kernighan, Pike | Prentice Hall of India |
| 4 | UNIX Network Programming , The Socket Networking API Vol. 1 | W. Richard Stevens, Bill Fenner, Andrew M. Rudoff | Prentice Hall of India |
| 5 | UNIX Network Programming , Interposes Communication Networking API Vol.2 | . W. Richard Stevens | Prentice Hall of India |
| 7 | C and UNIX Programming | N. Kutti | Tata Macgraw Hill |
| 8 | UNIX Shells – Bourne, Korn & C | Vijay Mukhi | PBP Publication |

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 406- Programming Skills VIII

Practical based on paper no 401.
Separate journals to be prepared for this subject 406.

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 407- Programming Skills IX

Practical based on paper no 404.
Separate journal to be prepared for this subject 407.

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 408- Programming Skills X

Practical based on paper no 405.
Separate journal to be prepared for this subject 408.

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 409-Part Time Project

Under paper 402, a part time project needs to be developed.
Project report is to be prepared and submitted for this paper 409.