Course: 401: Mobile Application Programming

Course Code	401
Course Title	**Mobile Application Programming**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	The purpose of the course is to make student capable of implementingthe concepts, methods and tools of mobile applications developmentusing Android and iOS.
Course Objective	The objective of the course is - 1. To provide a thorough introduction to the Android environment and tools for creating Android applications. 2. To impart knowledge of Objective-C and Apple iOS application design and development.
Pre-requisite	Basic concepts of Operating Systems, Programming skills in core Java andKnowledge of object oriented programming is desirable. Knowledge XML format is helpful.
Course Out come	After completion of this course, the student will be capable to develop,manage and maintain mobile device based application using Android. The student will be capable for working with iOS platform.
Course Content	**Unit -1 Introduction to Mobile Devices** 1.1 Pervasive computing 1.2 Categories and Features of Mobile Devices 1.3 Introduction to various mobile device OS. **Unit -2 Introduction to Android and Working with Basic UI** 2.1 Evaluation of Android and OHA 2.2 Architecture of Android OS 2.3 Introduction to Android SDK 2.4 Android Development tools : The Android Virtual Device and SDK Manager, The Android Emulator, Dalvik Debug Monitor Service (DDMS), The Android Debug Bridge (ADB) 2.5 Android Application Structure: AndroidManifest.xml, Resources & R.java, Assets, Layouts &Drawable Resources, .apk structure 2.6 Working with Basic UI in with Android Activity 2.6.1 Widgets: Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, RadioGroup,Views, ProgressBar View and AutoCompleteTextView View, Text Fields, Views and ViewGroups 2.6.2 Layouts 2.6.3 TimePicker View, DatePicker View, ListView View, Spinner View 2.6.4 Dialogs: AlertDialogs, Toast notifications 2.6.5 Menus: Option menu, Context menu, Sub menu 2.6.6 Adapters for data binding: Array adapter, Cursor adapter 2.6.7 Event callback methods: onClick(), onLongClick(), onKey(), onTouch() etc.

	Unit -3 Android Application Components& Data Persistency 3.1 Android Activity and Activity lifecycle 3.2 Fragments 3.3 Intents 3.2.1 Intents and Intent Filters 3.2.2 Implicit Intent and Explicit Intent 3.4 Android Services and Activity lifecycle 3.5 Broadcasting events and actions 3.6 Data Persistency in Android 3.6.1 Shared preferences 3.6.2 File I/O Access: internal and external files 3.6.3 Working with SQLite Database – 3.6.3.1 Creating SQLite Database 3.6.3.2 Performing insert, update, delete and query operation 3.6.3.3 Working with Cursor 3.6.4 Content Provider and its operations **Unit-4 Introduction to iOS and Objective-C Basics** 4.1 Introduction to Mac OS architecture 4.2 installing iPhone SDK 4.3 Components of SDK 4.4 Objective-C basics 4.4.1 Classes, Objects, and Methods 4.4.2 Data Types and Expressions 4.4.3 Control Structures 4.4.4 Inheritance 4.4.5 Categories & Protocols **Unit-5Building basic iOS apps & Working with X-code** 5.1 Building basic iOS applications 5.1.1 Interface builder 5.1.2 Action, Outlets, Delegates, View Controllers 5.1.3 Designing Basic UI 5.1.4 UI event handing 5.2Working with X-code 5.2.1Building and running iOS program 5.2.2 Using iPhone simulator 5.2.3 Debugging & working with console
Reference Books	1. Beginning Android 4 Application Development, WEI-MENG LEE, WROX Publication-Wiley-India 2. Professional Android 4 Application Development by Reto Meier WROX Publication-Wiley-India, 2012 3. Android Programming Unleashed, B.M. Harwani ,Sams Publishing 4. Beginning Android 4 OnurCinarApressPublication 5. Programming in Objective-C 2.0 by Stephen Kochan, Addison-Wesley publication, 2009 6. Beginning iPhone SDK Programming with Objective-C, Wei-Meng Lee, Wrox 7. iOS 5 Programming Cookbook by VandadNahavandippor, O'reilly Publication
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Course: 402: Information Systems

Course Code	402
Course Title	**Information Systems**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	The purpose of the course is to make student capable of learning in depth, the different types of Information Systems
Course Objective	The objective of the course is - 1. To provide a thorough introduction to the different types of Information systems (IS) and also developing different types of IS applications. 2. To impart knowledge of manufacturing and services industries and the various business process involved in these systems 3. Learn advanced systems and technologies for acquiring entrepreneurship sills.
Pre-requisite	Fundamental knowledge of software systems, software engineering
Course Out come	After completion of this course, the student will be capable to develop, distinguish, manage and maintain Information systems. The student will be capable for developing different types of Information systems and IS reports; and enhance the skills of individual as an entrepreneur and IS professional.
Course Content	**Unit 1. Managing the Digital Firm & Information System in the Enterprise** 1.1 Need of Information System 1.1.1 What is an Information System? 1.1.2 CompetitiveBusiness Environment 1.1.3 A Business Perspective on Information Systems 1.2 Approaches to Information Systems 1.2.1 Technical Approach 1.2.2 Behavioral Approach 1.2.3 Socio-technical Systems 1.3 The role of Information System 1.3.1 Scope of Information System 1.3.2 Organizational Design 1.3.3 Electronic Commerce and Electronic Business 1.4 Use of Information System 1.4.1 Challenge of Information Systems 1.5 System Applications in the Organization 1.5.1 Kinds of Information Systems 1.5.2 Types of Information Systems 1.5.3 Relationship of systems with one another 1.6 MIS Development Process 1.7 Functional Perspective of System 1.7.1 Various Information Systems like Sales and Marketing,Manufacturing and Production, Financial and Accounting, Human Resource etc. 1.7.2 Difference between Information Requirements of a Manufacturing Sector and Service Sector 1.8 Integrating Functions and Business Processes 1.8.1 Business Processes and Information System 1.8.2 Customer Relationship Management (CRM)

	and SupplyChain Management 1.8.3 Enterprise Systems 1.8.4 Vertical and Horizontal Industrial Networks 1.9 Difference between general reports and MIS reports 1.10 Difference among General Software Projects, Turn-Key Projects and Legacy Systems **Unit 2. Information System, Organizations, Management and Strategy, E-Commerce & E-Business** 2.1 Relationship of an Organization with Information System 2.1.1 What is an Organization? 2.1.2 Features of Organization 2.2 Role of Information System in Organizations 2.2.1 How Information System affect Organization? 2.2.2 Implications for the design and Understanding of Information System 2.3 Relationship of Manager, Decision Making and Information Systems 2.3.1 Role of Managers in Information System 2.3.2 Managers and Decision Making 2.4 Information System and Business Strategies 2.4.1 What is Strategic Information System? 2.4.2 Business Level Strategy and Value Chain Model 2.4.3 Supply Chain Management and Efficient Customer Response system 2.5 Electronic Commerce and Electronic Business 2.5.1 Emerging Trends 2.5.1.1 New Business Models 2.5.2 Electronic Commerce 2.5.3 Electronic Commerce Payment Systems 2.5.4 Electronic Business and Digital Firm 2.5.5 Challenges and Opportunities of E-Commerce **Unit 3. 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 **Unit 4. Decision Making** 4.1 Decision Support System (DSS) 4.1.1 Relationship of MIS and DSS 4.1.2 Types of Decision Support System 4.1.3 Components of Decision Support System 4.1.4 Decision Support System Applications 4.2 Group Decision Support System (GDSS) 4.2.1 What is Group Decision Support System? 4.2.2 Characteristics of Group Decision Support System 4.2.3 Importance of Group Decision Support System 4.3 Executive Support System (ESS) 4.3.1 Role of Executive Support System 4.3.2 Development of Executive Support System 4.3.3 Advantage of Executive Support System

	Unit 5. Control and Security of Information System 5.1 Threats to Information Systems 5.2 System Quality Problems 5.2.1 Software and Data Quality Problems 5.3 Difference between Safety and Security of Information Systems 5.4 Control Environment 5.4.1 General Controls and Application Controls 5.4.2 Security issue on E-Commerce 5.4.3 Control Structure Development
Reference Books	1. Management Information System : Managing A Digital Firm – 9th Ed., Kenneth C. Laudon & Jane P. Laudon, Pearson Education, Second Indian Reprint 2004 2. Principles of Information Systems – A Managerial Approach, 9th 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
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Course: 403-Data Communication and Network Protocols

Course Code	403
Course Title	**Data Communication and Network Protocols**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	The purpose of the course is to Learn Advanced concepts of Network Protocols and Data Communication.
Course Objective	The objective of the course is - 3. To provide a thorough introduction to the Network concepts. 4. To implement knowledge of all network concepts in real world.
Pre-requisite	Basic concepts of Concepts of Computer Networks
Course Out come	After completion of this course, the student will be capable to understand and implement network concepts.
Course Content	**Unit-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 **Unit-2. IP addressing androuting, IP Protocol** 2.1 Classfull addressing 2.2 Classless addressing 2.3 Delivery, forwarding and routing of IP packets 2.4 Introduction 2.4.1 Datagram 2.4.2 Fragmentation 2.4.3 Options 2.4.4 Checksum 2.4.5 Utilities **Unit-3. ARP, RARP & ICMP** 3.1 Introduction 3.2 ARP, RARP Packet formats 3.3 ARP, RARP Encapsulation 3.4 Operation 3.5 Proxy ARP 3.6 RARP server 3.7 ICMP 3.7.1 Introduction 3.7.2 Message Types 3.7.3 Message format 3.7.4 Error reporting 3.7.5 Query 3.7.6 Checksum 3.7.7 Debugging tools **Unit-4. UDP & TCP** 4.1 UDP 4.1.1 Introduction 4.1.2 User datagram 4.1.3 Checksum

	4.1.4 Operation 4.1.5 UDP usage 4.2 TCP 4.2.1 Services 4.2.2 Features 4.2.3 Segment 4.2.4 Connection 4.2.5 State transition diagram 4.2.6 Flow control 4.2.7 Error control 4.2.8 Congestion control 4.2.9 TCP timers 4.2.10 Options **Unit-5. DNS & Other network protocols/services** 5.1 DNS 5.1.1 Domain Name space and distribution 5.1.2 DNS in Internet 5.1.3 Resolution 5.1.4 DNS messages 5.1.5 Record types 5.1.6 Compression 5.1.7 DDNS 5.1.8 Encapsulation 5.2 Introduction to other protocols/services 5.2.1 Unicast routing protocols RIP, OSPF, BGP 5.2.2 Multicast protocol: IGMP 5.2.3 Stream Control Transmission protocol (SCTP) 5.2.4 Host configuration: BOOTP & DHCP 5.2.5 Remote Login: TELNET 5.2.6 File Transfer: FTP, TFTP 5.2.7 Electronic Mail: SMTP, POP, IMAP 5.2.8 Network Management: SNMP **Self study:** Study of IP next generation including IPSec. Development and demonstration of network software tools using above protocols.
Reference Books	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.
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Course: 403: Cyber Security

Course Code	403
Course Title	**Cyber Security**
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	To understand the major concepts of Cyber Security and Forensics
Course Objective	To teach the concepts of Cyber Security and Forensics and how it can be applied to various components to make the complete application environment secured.
Pre-requisite	Basic knowledge of Computer Networking, Web Application and File Structures.
Course Out come	After completion of this course, the students will be in a position to take up cyber forensics as career as well as those who want to seek careers in cyber security and to gain experience of doing independent study and research in the field of cyber security and cyber forensics.
Course Content	**Unit 1: Information Security, Threats, Vulnerabilities, Cryptography** 1.1 Information Security 1.1.1 Information Security Overview 1.1.2 Types of Attacks 1.1.4 E-commerce Security 1.1.5 Computer Forensics 1.1.6 Steganography 1.2 Security Threats and Vulnerabilities 1.2.1 Overview of Security threats 1.2.2 Weak / Strong Passwords and Password Cracking 1.2.3 Insecure Network connections 1.2.4 Malicious Code 1.2.5 Programming Bugs 1.2.6 Cyber crime and Cyber terrorism 1.2.7 Information Warfare and Surveillance 1.3 Cryptography / Encryption 1.3.1 Introduction to Cryptography / Encryption 1.3.2 Digital Signatures 1.3.3 Public Key infrastructure 1.3.4 Applications of Cryptography 1.3.5 Tools and techniques of Cryptography **Unit 2:** 2.1 Security Management Practices 2.1.1 Overview of Security Management 2.1.2 Information Classification Process 2.1.3 Security Policy 2.1.4 Risk Management 2.1.5 Security Procedures and Guidelines 2.1.6 Business Continuity and Disaster Recovery 2.2 Security Laws and Standards 2.2.1 Security Assurance 2.2.2 Security Laws 2.2.3 IPR 2.2.4 International Standards 2.2.5 Security Audit

	2.2.6 SSE-CMM / COBIT **Unit 3:** 3.1 Access Control and Intrusion Detection 3.1.1 Overview of Identification and Authorization 3.1.2 Overview of IDS 3.1.3 Intrusion Detection Systems and Intrusion Prevention Systems 3.2 Server Management and Firewalls 3.2.1 User Management 3.2.2 Overview of Firewalls 3.2.3 Types of Firewalls 3.2.4 DMZ and firewall features 3.3 Security for VPN and Next Generation Technologies 3.3.1 VPN Security 3.3.2 Security in Multimedia Networks **Unit 4:** 4.1 Security Architectures and Models 4.1.1 Designing Secure Operating Systems 4.1.2 Controls to enforce security services 4.1.3 Information Security Models 4.2 System Security 4.2.1 Desktop Security 4.2.2 email security: PGP and SMIME 4.3 Database Security 4.4 OS Security 4.4.1 OS Security Vulnerabilities, updates and patches 4.4.2 OS integrity checks 4.4.3 Anti-virus software 4.4.4 Configuring the OS for security 4.4.5 OS Security Vulnerabilities, updates and patches 4.5 Wireless Networks and Security 4.5.1 Components of wireless networks 4.5.2 Security issues in wireless **Unit 5:** **Web Security** 5.1 Web Hacking Basics 5.2 HTTP & HTTPS URL 5.3 Overview of Java security 5.4 Reading the HTML source 5.5 Applet Security 5.6 Servlets Security 5.7 Symmetric and Asymmetric Encryptions 5.8 Network security Basics 5.9 Firewalls & IDS 5.10 Digital Certificates 5.11 Hashing, Message Digest & Digital Signatures Self Study: Secure JDBC, Securing Large Applications, Cyber Graffiti
Reference Books	1. Donn Parkers, " Fighting Computer Crime: A New Framework for Protecting Information", John Wiley&Sons, 2003 2. Micki Krause, Harold F.Tripton, " Information Security Management Handbook", Auerbach Publications, 2012.

	3. Nina Godbole, SunitBelapur, “Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Wiley India Publications, April, 2011 4. James Graham, Richard Howard, Ryan Olsan, “Cyber Security Essentials” CRC Press 5. Jennifer L. Bayuk, Jason Healey, Paul Rohmeyer, “Cyber Security Policy Guidebook” Wiley Publications 6. Albert J. Marcella, Jr. Doug Menendez ”CYBER FORENSICS: A Field Manual for Collecting, Examining, and Preserving Evidence of Computer Crimes”, Auerbach Publications 7. Robert Jones, “Internet Forensics: Using Digital Evidence to Solve Computer Crime”, O’Reilly Media, October, 2005 8. Charles P. Fleeger, "Security in Computing", Prentice Hall, New Delhi, 2009 9. Behrouz A.Forouzan, “Cryptography & Network Security”, Tata McGraw Hill, India, New Delhi, 2009. 10. William Stallings, “Cryptography and Network Security, Prentice Hall, New Delhi, 2006. 11. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons, New York, 2004. 12. Nichols and Lekka, “Wireless Security-Models, Threats and Solutions”, Tata McGraw – Hill, New Delhi, 2006. 13. Merritt Maxim and David Pollino, ”Wireless Security”,Osborne/McGraw Hill, New Delhi, 2005.
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Course: 404: Interactive Computer Graphics

Course Code	404
Course Title	**Interactive Computer Graphics**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	The purpose of the course is to make student capable of implementing the concepts, methods and tools of Interactive Computer Graphics
Course Objective	The objective of the course is - 1. To provide a thorough introduction to the graphics environment and tools for creating graphics applications. 2. To impart knowledge of Interactive Computer Graphics.
Pre-requisite	Basic concepts of Operating Systems & Programming skills
Course Out come	After completion of this course, the student will be capable to develop, manage and maintain Interactive Computer Graphics. The student will be capable for working with graphics platform.
Course Content	**Unit -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 **Unit -2. Display Devices&Basic Raster Graphics Algorithms** 2.1 Display Devices 2.1.1 Hardcopy Display Devices 2.1.2 Display Technology 2.1.3 Raster-Scan Display 2.1.4 Video Controller 2.1.5 Image Scanners 2.2 Basic Raster Graphics Algorithms 2.2.1 Frame Buffers and Display Controllers 2.2.2 The output pipeline 2.2.3 Scan Converting Lines 2.2.3.1 Incremental Algorithm 2.2.3.2 Midpoint Line Algorithm 2.2.3.3 Thick Line Drawing 2.2.4 Scan Converting Circles 2.2.4.1 Eight-Way Symmetry 2.2.4.2 Midpoint Circle Algorithm 2.2.5 Scan Converting Ellipses **Unit -3. Polygons,** 3.1 Polygons and its representation 3.2 Inside Tests 3.2.1 Even-odd Method 3.2.2 Winding Number Method 3.2.3 Method of Index 3.3 Filling polygons 3.3.1 Flood Fill

	3.3.2 Scan Line Fill 3.3.3 Boundary Fill 3.4 Pattern Filling 3.5 Line Styles and Pen Style 3.6 Character Generation **Unit-4. Windowing and Clipping** 4.1 Definition of Windowing and Clipping 4.2 Viewing Transformation 4.3 Point Clipping 4.4 Clipping Lines 4.4.1 Line clipping by Solving Simultaneous Equations 4.4.2 Cohen – Sutherland Line Clipping Algorithm 4.4.3 Liang – Barskey Algorithm 4.4.4 Midpoint Subdivision Algorithm 4.5 Clipping Circles and Ellipses 4.6 Clipping Polygons 4.6.1 Sutherland Hodgman Polygon Clipping Algorithm 4.7 Text Clipping **Unit-5. Advanced graphics, Modelling & Animation** 5.1 Transformations 5.1.1 2D Transformations 5.1.2 Homogeneous Coordinated 5.1.3 Composite 2D Transformation 5.1.4 The Viewing Transformation 5.1.5 Matrix representation of 3D Transformations 5.1.6 Composite 3D Transformations 5.1.7 Transformation as a change in Coordinate System 5.2 Viewing in 3D 5.2.1 Projections 5.2.2 Specifying an Arbitrary 3D View 5.2.3 3D Views 5.3 Geometric Modelling 5.3.1 Introduction 5.3.2 Characteristics and retained mode Graphics Packages 5.3.3 Defining and Displaying Structures 5.4 Introduction to Illumination and Shading 5.5 Image Manipulation and Storage 5.5.1 Introduction to Image 5.5.2 Filtering 5.5.3 Image Processing 5.5.4 Image Composition 5.5.5 Image Storage 5.5.6 Special Effects with Image 5.6 Animation 5.6.1 Design of Animation Sequences 5.6.2 Key Frame Systems 5.6.2.1 Morphing 5.6.2.2 Simulating Acceleration 5.6.3 Motion Specifications 5.6.3.1 Direct Motion Specification 5.6.3.2 Goal Directed Systems 5.7 Introduction to OpenGL 5.7.1 Open GL Pipeline 5.7.2 Overview of OpenGL routine 5.7.2.1 OpenGL bitmap function

	5.7.2.2 OpenGL output primitives Self Study: OpenGL 2D function
Reference Books	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, IIIrd Edition
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Course: 404: Cryptography

Course Code	404
Course Title	**Cryptography**
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	To understand the major concepts of Cryptography
Course Objective	To teach the concepts of Cryptography and its practical applications.
Pre-requisite	Mathematical concepts, C++ programming
Course Out come	The student will be having the basic knowledge of Cryptography and will be able to analyze and use the various methods of Cryptography
Course Content	**Unit 1:** 1.1 Security trends 1.2 Attacks and services 1.3 Classical crypto systems 1.4 Different types ofciphers 1.5 LFSR sequences 1.6 Basic Number theory 1.7 Congruences 1.8 Modular exponentiation 1.9 Fermat and Euler's theorem 1.10 Legendre and Jacobi symbols 1.11 Finitefields – continued fractions **Unit 2:** 2.1 Key Length 2.2 Key Management 2.3 Electronic Codebook Mode 2.4 Block Replay 2.5 Cipher Block Chaining Mode 2.6 Stream Ciphers 2.7 Self-Synchronizing Stream Ciphers 2.8 Cipher-Feedback Mode 2.9 Synchronous Stream Ciphers 2.10 Output-Feedback Mode 2.11 Counter Mode 2.12 Choosing a Cipher Mode 2.13 Interleaving 2.14 Block Ciphers versus Stream Ciphers 2.15 Choosing an Algorithm 2.16 PublicKey Cryptography versus Symmetric Cryptography 2.17 Encrypting Communications Channels 2.18 Encrypting Data for Storage 2.19 Hardware Encryption versus Software Encryption 2.20 Compression, Encoding, and Encryption 2.21 Detecting Encryption 2.22 Hiding and Destroying Information **Unit 3:** 3.1 Simple DES 3.2 Differential cryptoanalysis 3.3 DES – Modes of operation

	3.4 Triple DES – AES – RC4 – RSA– Attacks **Unit 4:** 4.1 Discrete Logarithms 4.2 Computing discrete logs 4.3 Diffie-Hellman key exchange 4.4 ElGamal Public keycryptosystems 4.5 Hash functions 4.6 Secure Hash 4.7 Birthday attacks 4.8 Digital signatures – RSA –ElGamal – DSA. **Unit 5:** 5.1 Ongchnorr-Shamir 5.2 Cellular Automata 5.3 Shamir's Three-Pass Protocol 5.4 IBM Secret-Key Management Protocol 5.5 MITRENET 5.6 Kerberos 5.7 IBM Common Cryptographic Architecture
Reference Books	1. Wade Trappe, Lawrence C Washington, " Introduction to Cryptography with coding theory", 2nd ed,Pearson, 2007. 2. William Stallings, "Crpyptography and Network security Principles and Practices", Pearson/PHI, 4thed, 2006. 3. W. Mao, "Modern Cryptography Theory and Practice", Pearson Education, SecondEdition, 2007. 4. Charles P. Pfleeger, Shari Lawrence Pfleeger Security in computing Third Edition – Prentice Hall ofIndia, 2006 5. Bruce Schneier, "Applied Cryptography: Protocols, Algorithms, and Source Code in C" John Wiley & Sons, Inc, 2nd Edition, 1996. 6. Wenbo Mao, "Modern Cryptography Theory and Practice", Pearson Education, 2004 7. AtulKahate, "Cryptography and Network Security", Tata McGrew Hill, 2003. 8. William Stallings, "Cryptography and Network Security, Prentice Hall, New Delhi, 2006. 9. Bernard Menezes, "Network Security and Cryptography", Cengage Learning, New Delhi, 2010.
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Course: 405: **Unix Internals & Shell Programming**

Course Code	405
Course Title	**Unix Internals & Shell Programming**
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	The purpose of the course is to make student capable of implementing the concepts, methods and tools of Unix internals & Shell Programming
Course Objective	The objective of the course is - 5. Acquaint the student with the Unix Operating System 6. shell programming and Internals of the Unix O.S.
Pre-requisite	Operating Systems, Programming Skills
Course Out come	After completion of this course, the student will be capable to develop, manage and maintain Unix & shell based programming. The student will be capable of working with Unix OS.
Course Content	**Unit -1 Introduction & Overview of Unix OS** 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 1.5 Logging in & out 1.6Inode& File Structure 1.7 File System Structure & Features 1.8 Booting Sequence &Init process 1.9 File Access Permission **Unit-2Shell programming& Advanced Shell programming** 2.1 Basic Shell Programming 2.1.1 Environment & User defined Variables 2.1.2 Argument processing 2.1.3 Shell's Interpretation at prompt 2.1.4 Arithmetic Expression Evaluation 2.1.5 Control Structures 2.1.6 Redirection 2.1.7 Background Process & Priorities of Process 2.1.8 Conditional Execution 2.1.9 Parameter & quote substitution 2.1.10 Command Evaluation & Command Grouping 2.1.11 Trapping Signals 2.2 Advanced Shell Programming& Utilities 2.2.1 Filtering Utilities – sed 2.2.2 awk 2.2.3 Batch Processes 2.2.4 Splitting, Comparing, Sorting, Merging and Ordering Files 2.2.5 Terminals Handling 2.2.6 Communication with Other Users 2.2.7 Spooling and Print Management 2.2.8 Backup and Recovery 2.2.9 Remote Login, File Transfer & sharing

	Unit-3 File System & Internal Representation 3.1 Structure of Buffer Pool 3.2 Superblock 3.3 Inode assignment to file 3.4 Reading, writing and allocation of disk blocks 3.5 System calls for File System **Unit-4 Process Management** 4.1 Status and Transitions 4.2 Context and manipulation of process address space 4.3 Process creation and termination 4.4 Process scheduling 4.5 System calls for process management 4.6 Inter Process Communication **Unit-5 Memory Management& I/O Subsystem** 5.1 Swapping 5.2 Demand Paging 5.3 System Calls for memory management 5.4 Solution with semaphore 5.5 The I/O Subsystem 5.5.1 Driver interface 5.5.2 Disk and terminal drivers 5.5.3 Streams **Self Study :** Sockets programming.
Reference Books	1. The Design of UNIX OS, M.J. Bach, Prentice Hall 2. UNIX for Super-Users, Eric Foxley, Addision Wesley 3. The UNIX Programming Environment by Brian W. Kernighan, Pike Prentice Hall ofIndia 4. UNIX Network Programming , The Socket Networking API Vol. 1 by W. Richard Stevens, Bill Fenner, Andrew M. Rudoff Prentice Hall of India 5. UNIX Network Programming, Interpocess Communication Networking API Vol.2. by W. Richard Stevens PHI 6. C and UNIX Programming by N. Kutti Tata McGraw Hill 7. UNIX Shells – Bourne, Korn& C Vijay Mukhi BPB Publication
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30 % internal assessment and 70% external assessment

Veer Narmad South Gujarat University, Surat
M.C.A (4th Semester)
Syllabus Effective from: June 2016
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 (4th Semester)
Syllabus Effective from: June 2016
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 (4th Semester)
Syllabus Effective from: June 2016
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 (4th Semester)
Syllabus Effective from: June 2016
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.
The Examination will be based on presentation and viva-voce.