VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
MCA (5th Semester)
Network Group

Course: 501: **Cloud Computing**

Course Code	501
Course Title	**Cloud Computing**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	The purpose of the course is to make student capable of implementing the concepts, methods and tools of Cloud Computing
Course Objective	The objective of the course is to provide comprehensive and in-depth knowledge of Cloud Computing Concepts, technologies, architecture and applications and implementations.
Pre-requisite	Web Services, DBMS concepts, Networking
Course Outcome	After completion of this course, the students will be capable to work in various cloud environment like Salesforce, Azure, AWS.
Course Content	**Unit 1: Introduction** 1.1 Grid Computing 1.2 Cluster Computing 1.3 Cloud Computing (NIST Model) 1.3.1 Evolution 1.3.2 History, Properties, characteristics & Disadvantages **Unit 2: Cloud Computing Architecture** 2.1 Cloud Computing Stack 2.1.1 Comparison with traditional architecture 2.2 Service Models Introduction 2.2.1 Infrastructure as a Service (IaaS) 2.2.2 Platform as a Service (PaaS) 2.2.3 Software as a Service (SaaS) 2.3 Deployment Models 2.3.1 Public Cloud 2.3.2 Private Cloud 2.3.3 Hybrid Cloud 2.3.4 Community Cloud **Unit 3: Service Models** 3.1. Infrastructure as a Service (IaaS) 3.1.1 Introduction to Virtualization 3.1.1.1 Hypervisors, Machine Image, Virtual Machine 3.1.2 Resource Virtualization 3.1.2.1 Server, Storage, Network 3.1.3 Amazon EC 3.1.4 Eucalyptus 3.2. Platform as a Service (PaaS) 3.2.1. Introduction to Service Oriented Architecture (SOA) 3.2.2. Cloud Platform 3.2.2.1. Computation

	3.2.2.2. Storage 3.2.3. Microsoft Azure 3.2.4. SalesForce.com's Force.com 3.3. Software as a Service (SaaS) 3.3.1. Web Services 3.3.2. Web OS **Unit 4: Cloud Security** 4.1 Infrastructure Security 4.2 Data Security and Storage 4.3 Identity & Access Management 4.4 Access Control 4.5 Authentication in Cloud **Unit 5: Introduction to Cloud Databases (DbaaS)** 5.1 Amazon SimpleDB & RDS 5.2 Azure Table Service & SQL Azure 5.3 BigTable 5.4 Oracle Cloud
Reference Books	1. Cloud Computing Principles and Paradigms by Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley, 2011 2. Cloud Computing : Principles, Systems and Applications by Nikos Antonopoulos, Lee Gillam, Springer 2012 3. Enterprise Cloud Computing : Technology, Architecture, Applications by Gautam Shroff Cambridge University Press 2010 4. Cloud and Virtual Data Storage Networking by Greg Schulz Auerbach, 2011 5. Cloud Security : A Comprehensive Guide to Secure Cloud Computing by Ronald L Krutz, Russel Dean Vines, John Wiley & Sons, 2010 6. Cloud Computing Bible by Barrie Sosinsky, Wiley India, 2011 7. Cloud Computing by David Crookes, TMH Education 2012 8. Cloud Computing : Implementation, Management and Security by James F Ransome, John W Rittinghouse, CRC Press, 2009 9. Amazon Cloud Computing with Java by Aditya Yadav, Lulu.com, 2010 10. Grid and Cloud Database Management by Fiore, SAndro, Aloisio, Giovanni, Springer, 2010 11. Building a Database Cloud for Dummies by Michael Wessler, John Wiley & Sons, 2012
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination

Course: 501: **Internet of Things (IoT) & Embedded Systems**

Course Code	501
Course Title	**Internet of Things (IoT) & Embedded Systems**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	This course is an introduction for students to IoT. The course also gives students an idea about various components of IoT and explains the working of them. The course also explains the role of embedded systems in IoT ecosystem.
Course Objective	The objective of the course is - 1. To make students understand IoT 2. To make student understand various component of Micro-Computer and their working 3. To explain various types of Micro-Computer operating system 4. To introduce students with Programming in IoT.
Pre-requisite	C , .NET, Unix
Course Outcome	After studying this Student will be able to understand how Micro-Computer works and importance of various components of a Micro-Computer. This course will also help students to appreciate the role of embedded systems in IoT Environment. After successful completion students will be able to work with different types of Micro-Computers and operating systems for their IoT based application development.
Course Content	**Unit 1: Introduction to Embedded Systems** 1.1 What is a Microcontroller? 1.2 Architecture of Microcontroller 1.2.1 ARM 1.2.2 8051 1.3 Introduction to Sensors 1.4 Types of Sensors & their work 1.5 Wireless Sensor Network 1.6 Role of Microcontrollers in IoT **Unit 2: Internet of Things (IoT)** 2.1 Introduction to IoT 2.1.1 IoT Today 2.1.2 IoT Vision 2.2 IoT Architecture 2.2.1 Elements of IOT Ecosystem 2.2.2 Physical-Entity View and IoT Context View 2.2.3 Requirement process and —other views 2.3 IoT Related Standards and Protocols 2.4 Industrial Applications of IoT 2.5 IoT Privacy, Security & Governance 2.5.1 Identification in Distributed Environment 2.5.2 Anonymization of user's Data in a Distributed and Mobile Environment 2.5.3 Device Authentication 2.5.4 Data Correlation and Information Retrieval 2.5.5 Human IoT Trust Relationship 2.5.6 Risks of Isolation and Confinement 2.6 IoT Botnet

	Unit 3: Micro-Computing Environment 3.1 What is a Micro-Computer? 3.2 Micro-Computing Paradigm 3.3 Difference between Microcontroller and Micro-Computer 3.4 Micro-Computer OS 3.4.1 Raspbian OS 3.4.2 Windows IoT 3.4.3 Contiki OS 3.4.4 RIOT 3.5 Use of Micro-Computers in IoT 3.6 Interfacing with Micro-Computer **Unit 4: Raspberry Pi : A platform for IoT** 4.1 Introduction to Pi family 4.2 OS in Pi 4.3 Configuring Pi for IoT 4.4 Interacting Pi with Ports & Sensors **Unit 5: IoT Application Development Using .NET** 5.1 Server side Development 5.2 Client side Development 5.3 Peer to Peer Interaction 5.4 IoT Interaction through Mobile Apps
Reference Books	1) Introduction to Embedded System – By Shibu K V , McGrawHill 2) Microcontrollers – Architecture, Programming, Interfacing and system design – By Raj Kamal , Pearson 3) Exploring C for Microcontrollers : A hands on approach, Springer 4) 8051 Microcontrollers an Application based Introduction, Elsevier 5) Getting Started with Internet of Things – By Cuno Pfister, O'Reilly 6) Learning Internet of Things – By Peter Waher , Packt Publication 7) Internet of Things : A Hands-on Approach – By Arshdip Bahga and Vijay Madisetti 8) Raspberry Pi User Guide – By Eben Upton and Garath Halfacree, Wiley 9) Raspberry Pi for Dummies , Wiley 10) Microprocessor Architecture, Programming and Applications with the 8085 - By Ramesh Gaonkar , Penram International Publishing 11) Raspberry Pi IoT in C – By Harry Fairhead, I/O Press
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination

Course: 502: **Artificial Intelligence and Knowledge Based Systems**

Course Code	502
Course Title	**Artificial Intelligence and Knowledge Based Systems**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	The purpose of the course is to make student capable of implementing the concepts, methods and tools of Artificial Intelligence and learn their implementation in Knowledge Based Systems
Course Objective	To acquaint students with concepts of Artificial Intelligence and its applications.
Pre-requisite	Data Structures, Information Systems
Course Outcome	After completion of this course, the students will be capable to use various Artificial Intelligence techniques in various applications.
Course Content	**Unit 1: Introduction to Artificial Intelligence** 1.1. What is AI 1.2. Applications of AI 1.3. Introduction to Expert System 1.4. Applications of expert systems **Unit 2: Knowledge Overview** 2.1. Definition and importance of knowledge 2.2. Overview knowledge representation 2.3. Overview of knowledge organization 2.4. Overview of knowledge Manipulation 2.5. Overview of Knowledge Acquisition **Unit 3: Representation and Search** 3.1. Structured Knowledge 3.1.1. Associative networks 3.1.2. Frame structures 3.1.3. Conceptual dependencies and scripts 3.2. Object oriented representation **Unit 4: Organization and Manipulation, Knowledge Acquisition** 4.1. Introduction to organization 4.2. Search techniques 4.2.1. Uninformed search 4.2.2. Informed search 4.3. Introduction to matching Techniques 4.3 Knowledge Acquisition 4.3.1. Knowledge learning types 4.3.2. General learning models 4.3.3. Performance of learning models **Unit 5: Expert System** 5.1. Advantages of Expert Systems 5.2. Characteristics of Expert Systems 5.3. Design of Expert Systems 5.3.1. Selecting Problem 5.3.2. Stages in Expert systems development 5.3.3. Errors in developments 5.3.4. Expert System Software Engineering 5.3.5. Expert System Life Cycle

Reference Books	1. Introduction to Artificial Intelligence and Expert System by Dan W. Patterson, PHI (1999) 2. Artificial Intelligence – A Modern Approach (2nd Edition 2004) by Stuart J. Russell and Peter Norvig, Pearson Education 3. Artificial Intelligence - Structures and Strategies for Complex Problem Solving (4th Edition 2004) by George F. Luger, Pearson Education 4. Foundation of Artificial Intelligence and Expert Systems by V.S. Janakiraman, K. Sarukesi, P. Gopalakrishnan, Mc Millan (2002) 5. Expert Systems Principles and Programming (3rd Edition) by Giarratano & Riley, Thomson (Vikas Pulishing House) 6. Introduction to Artificial Intelligence by Rajendra Akerkar, PHI
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination

Course: 503: **Network Essentials and its Security**

Course Code	503
Course Title	**Network Essentials and its Security**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	To make students learn Network essentials and various security measures for the challenges to which the IT industry is exposed
Course Objective	To understand Network Management and its security
Pre-requisite	Computer Network, TCP/IP
Course Outcome	Students will be able to solve and determine best solutions for the challenging area of Network Security
Course Content	**Unit 1: Network Essentials** 1.1 Repeaters & Bridges 1.1.1 LAN Expansion 1.1.2 Repeaters 1.1.3 Bridges 1.1.4 How Bridges Work 1.1.5 Creating the routing table 1.1.6 Segmenting Network Traffic 1.1.7 Remote Bridges 1.1.8 Differentiating between bridges and repeaters 1.2 Routers & Gateways 1.2.1 Routers 1.2.2 How routers work 1.2.3 Routing benefits 1.2.4 Routing protocols 1.2.5 Routing V/S Bridging 1.2.6 B Routers 1.2.7 Gateways 1.2.8 How Gateways work 1.3 Network Administration 1.3.1 Bottlenecks 1.3.2 Simple Network Management Protocol 1.3.3 Data Protection 1.3.4 Backup Methods 1.3.5 Testing and Storage 1.3.6 Implementing a Backup System 1.3.7 Uninterruptible Power Suppliers 1.3.8 How Gateways work 1.3.9 Implementing Fault Tolerant Systems 1.3.10 RAID 1.3.11 Sector Sparing 1.4 Advance WAN Transmission 1.4.1 Overview 1.4.2 Multiplexing, Packet and Circuit Switching Networks 1.4.3 X.25 1.4.4 Asynchronous Transfer Mode (ATM) 1.4.5 ISDN 1.4.6 SONET 1.4.7 SMDS **Unit 2: Introduction to Network Security**

	Unit 3: Cryptography Techniques 3.1 Classical Cryptography 3.2 Conventional Cryptography 3.2.1 DES 3.3 Public – key Cryptography 3.3.1 RSA 3.4 Digital Signatures 3.4.1 DSA **Unit 4: Security Services** 4.1 Message Integrity 4.2 Confidentiality and Authentication 4.3 Certification and Key Management 4.3.1 PKI **Unit 5: Network Security Applications** 5.1 IP Security 5.1.1 IPsec 5.2 Web Security 5.2.1 SSL, TLS, SET 5.3 Electronic Mail Security 5.3.1 PGP, S/MIME 5.4 SNMP Security **Unit 6: Access Control in Computer Networks** 6.1 Authentication Protocols and Services 6.1.1 Kerberos and X.509 6.2 Firewalls 6.3 Virtual Private Networks (VPNs) **Unit 7: System Security** 7.1 Intrusion detection 7.2 Viruses **Unit 8: Mobile System & E-Commerce Securities** 8.1 3G Security 8.2 E-Payment Systems 8.3 Fair Data Exchange
Reference Books	1) Cryptography and Network Security, 2/e, ISBN: 0-13-869017-0 - W. Stallings - Pearson Education, 1999 2) Network Security Essentials: Applications and Standards, 1/e, ISBN: 0-13-016093-8 - W. Stallings - Pearson Education, 2000 3) SSL and TLS: designing and building secure systems, ISBN: 0-201-61598-3 - E. Rescorla - Addison-Wesley, 2001 4) Implementing Secure Intranets and Extranets, ISBN: 0-89006-447-4 - K M Phaltankar - Artech House Publishers, 2000 5) Secure Electronic Commerce: Building the Infrastructure for Digital Signature and Encryption, ISBN: 0-13-027276-0 - W. Ford, and M. Baum - Prentice Hall, 2001 6) Security in Computing, ISBN: 0-13-185794-0, 2/e - C. P. Pfleeger - Prentice Hall, 1997 7) Building Internet Firewalls, 2/e, ISBN: 1-56592-871-7 - E. D. Zwicky, et al - O'Reilly, 2000 8) CDMA Cellular Mobile Communications & Network Security, ISBN: 0-13-598418-1 - M. Y. Rhee, - Prentice Hall, 1998 9) Journal of Computer Security

	10) ACM Transactions on Information and System Security 11) ACM Conference on Computer and Communications Security 12) IEEE Symposium on Security and Privacy 13) Internet documents - RFCs (Request for Comments) 14) Guide to Networking Essentials, Fourth Edition - Greg Tomsho, et al 15) Computer Networking Essentials - Debra Littlejohn Shinder 16) Networking Essentials: Hands-On, Self-Paced Training for Supporting Local and Wide Area Networks - Microsoft Corporation (Corporate Author) 17) Computer Network - A. S. Tanenbaum
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination

Course: 504: **Network Administration**

Course Code	504
Course Title	**Network Administration**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	Understanding advanced network administration
Course Objective	To learn advanced network administration, its configuration and maintenance
Pre-requisite	Computer Network, TCP/IP
Course Outcome	After studying the course, students will be able to perform Network Administration
Course Content	**Unit 1: Networking and TCP/IP on Linux** 1.1 Fundamentals of Linux Networking 1.2 Fundamentals of TCP/IP on the Linux Operating System 1.3 Advanced Linux TCP/IP Concepts 1.4 Introduction to Dial-up Technologies **Unit 2: Dynamic Host Configuration Protocol** 2.1 Introduction to BOOTP and DHCP 2.2 Installing and Examining a Linux DHCP server 2.3 Examining Additional DHCP Options and Configurations **Unit 3: Domain Name System** 3.1 Introduction to the Domain Name System 3.2 Installing and Configuring DNS **Unit 4: The Network File System** 4.1 Introduction to the Network File System 4.2 Configuring NFS **Unit 5: Linux Remote Administration** 5.1 Introduction to Remote Administration 5.2 The Telnet Protocol 5.3 The open secure Shell protocol **Unit 6: The Cron Daemon** 6.1 Introduction to Automation 6.2 Configuring the Cron Daemon **Unit 7: Samba** 7.1 Introduction to Samba 7.2 Cross-Platform Connectivity 7.3 Installing and Configuring Samba **Unit 8: Linux System-Wide Logging** 8.1 Introduction to System-wide Logging 8.2 Configuring System-Logging **Unit 9: The Network Information Service** 9.1 Introduction to NIS 9.2 Setting Up and Configuring an NIS server
Reference Books	1) TCP/IP Network Administration - Craig Hunt - O'Reilly & Associates 2) Managing NFS and NIS - Hal Stern - O'Reilly & Associates 3) DNS and BIND - Albitz/Liu - O'Reilly & Associates

	4) Sendmail - Bryan Costales/Eric , Allman/Neil Rickert - O'Reilly & Associates 5) UNIX System Administration Handbook - Second Edition - Nemeth/Snyder/Seebass - Prentice Hall 6) Red Hat Linux Networking and System Administration – Terry Collings, Kurt Wall 7) Red Hat Linux 9 Bible - Christopher Negus 8) Official Red Hat Linux User's Guide - Red Hat Inc. 9) Official Red Hat Linux Administrator's Guide - Red Hat Inc. 10) Red Hat Linux Security and Optimization - Mohammad J. Kabir
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination

Course: 505: **Wireless Network and Mobile Computing**

Course Code	505
Course Title	**Wireless Network and Mobile Computing**
Credit	4
Teaching per Week	4 Hrs.
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	Understanding Wireless Network and Mobile Computing
Course Objective	To understand various aspects related to Wireless Network technologies, mobile networks and its computing
Pre-requisite	Computer Network
Course Outcome	Students will be able to implement various Wireless Network protocols and learn Mobile Computing
Course Content	**Unit 1: Introduction to Wireless Network Technologies** 1.1 Introduction 1.2 Standards 1.3 Emerging Technologies 1.4 OSI Basics 1.5 LAN Basics 1.6 LAN & WAN Protocols 1.7 Internet Protocol **Unit 2: Wireless LAN Technologies, Implementation and Layers** 2.1 Frequency Hopping Spread Spectrum 2.2 Direct Sequence Spread Spectrum (DSSS) 2.3 Interference 2.4 RF Math 2.5 Service Sets 2.6 Mobile IP 2.7 Appropriate use and design of wireless NetworkingMultipath 2.8 Co-location 2.9 Power-over-Ethernet (PoE) 2.10 Modulation and Bit Coding 2.11 Fragmentation 2.12 SIFS / PIFS / DIFS / EIFS **Unit 3: Hardware Configuration, Implementation and Protocols** 3.1 Access Points 3.2 Bridges 3.3 Workgroup bridges 3.4 Wireless Residential Gateways 3.5 Host Connectivity 3.6 Antennas, Cables, & Connectors 3.7 MAC and Routing Protocols for IEEE 802.11 3.8 Wireless Mesh Networks **Unit 4: MANET** 4.1. Various applications of MANET 4.2. Destination- Sequenced Distance Vector protocol 4.3. Dynamic Source Routing protocol 4.4. Ad Hoc On-Demand Distance-Vector protocol 4.5. Link Reversal Routing a. Gafni-Bertsekas algorithm b. Lightweight mobile routing algorithm.

	4.6. Temporally ordered routing algorithm **Unit 5: Introduction to Mobile Computing, GSM, GPRS & WAP** 5.1 Mobility, Nomadic, Mobile and Ubiquitous computing 5.2 Mobile Computing Architecture 5.3 Mobile Computing Technologies (Hardware, Software, Communication) 5.4 Introduction to GSM 5.5 GSM Architecture, Mobility Management, Network Signaling 5.6 GPRS Architecture 5.7 Network Nodes 5.8 Mobile Internet Standards, WAP Gateway and Protocols 5.9 WML
Reference Books	1) Wireless Local Area Network Fundamentals - Pejman Roshan, Jonathan Leary 2) Wireless Networks First Step (First-step series) - Jim Geier 3) 802.11 wireless network site surveying and installation - Bruce Alexander 4) Introduction to Wireless and Mobile Systems by Cengage Learning (Thompson) 5) J. Schiller, Mobile Communications, Addison –Wesley, 2003 6) Wi-Fi Security - Stewart Miller 7) Wireless and Mobile Network - Architecture Yi-Bing Lin & Imrich Chlamtac - John Wiley & Sons, 2001 8) Mobile and Wireless Design Essentials by Martyn Mallick, John Wiley & Sons 9) Guide to Designing and Implementing wireless LANs - Mark Ciampa - Thomson learning , Vikas Publishing House, 2001 10) Wireless Web Development - Ray Rischapter - Springer publishing, 2000
Teaching Methodology	Class work, Discussion, Self-Study, Seminars and/or Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on semester end University External examination

Course: 506: **Programming Skills XI**

Course Code	506
Course Title	**Programming Skills XI**
Credit	2
Teaching per Week	2 Hrs.
Minimum weeks/ Semester	15 (Including Lab. work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	This course helps students to implement the Cloud Computing/IOT practically.
Course Objective	Learning to implement fundamentals and advanced topics of Cloud Computing/IOT practically
Pre-requisite	Practical programming in desktop environment / Embedded Technology
Course Outcome	After studying the course, students will be able to practically work on advanced technology platforms of Cloud Computing/IOT.
Course Content	Practical based on paper no 501. Separate journal to be prepared for this subject 501.
Reference Books	-----
Teaching Methodology	Lab work, Practical Exercises (to be documented in a separate journal), Self-study, and/or Assignment
Evaluation Method	30% Internal assessment is based on Lab attendance, practical test, practical internal examination etc. 70% assessment is based on semester end University External practical examination

Course: 507: **Programming Skills XII**

Course Code	507
Course Title	**Programming Skills XII**
Credit	3
Teaching per Week	3 Hrs.
Minimum weeks/ Semester	15 (Including Lab. work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	This course helps students to understand the Networking and its security practically
Course Objective	Learning to implement Network and its security practically.
Pre-requisite	Network fundamentals
Course Outcome	After studying the course, students will be able to practically implement network and its security
Course Content	Practical based on paper no 503. Separate journal to be prepared for this subject 503.
Reference Books	-----
Teaching Methodology	Lab work, Practical Exercises (to be documented in a separate journal), Self-study, and/or Assignment
Evaluation Method	30% Internal assessment is based on Lab attendance, practical test, practical internal examination etc. 70% assessment is based on semester end University External practical examination

Course: 508: **Programming Skills XIII**

Course Code	508
Course Title	**Programming Skills XIII**
Credit	3
Teaching per Week	3 Hrs.
Minimum weeks/ Semester	15 (Including Lab. work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	This course helps students to learn network administration
Course Objective	Students will learn administration of network practically
Pre-requisite	Networking fundamentals
Course Outcome	After studying the course, students will be able to practically perform administrative tasks of networks practically
Course Content	Practical based on paper no 504. Separate journal to be prepared for this subject 504.
Reference Books	-----
Teaching Methodology	Lab work, Practical Exercises (to be documented in a separate journal), Self-study, and/or Assignment
Evaluation Method	30% Internal assessment is based on Lab attendance, practical test, practical internal examination etc. 70% assessment is based on semester end University External practical examination

Course: 509: **Programming Skills XIV**

Course Code	509
Course Title	**Programming Skills XIV**
Credit	2
Teaching per Week	2 Hrs.
Minimum weeks/ Semester	15 (Including Lab. work, examination, preparation, holidays etc.)
Review / Revision	June 2017
Purpose of Course	This course helps students to implement the basic and advanced concepts of wireless network and mobile computing
Course Objective	Learning wireless protocols and its implementation practically
Pre-requisite	Computer Network, C/C++ programming
Course Outcome	After studying the course, students will be able to practically develop/enhance wireless protocols and find better solutions application to the various industries dependent upon them
Course Content	Practical based on paper no 505. Separate journal to be prepared for this subject 505.
Reference Books	-----
Teaching Methodology	Lab work, Practical Exercises (to be documented in a separate journal), Self-study, and/or Assignment
Evaluation Method	30% Internal assessment is based on Lab attendance, practical test, practical internal examination etc. 70% assessment is based on semester end University External practical examination