SARVAJANIK
UNIVERSITY

INCLUSIVE | INTEGRATED | INNOVATIVE

Faculty of Science

Shree Ramkrishna Institute of Computer Education &
Applied Sciences, Surat

B.Sc. Information Technology

SEMESTER- 5

Program Structure		**Semester 5**						
Course Code	**Title**	**Teaching Hrs. per Week**		**Course Credits**	**University Examination**		**Internal Marks**	**Total Marks**
		Theory	**Practical**		**Duration**	**Marks**		
	Life Skills/ NCC/NSS	2		2				
BIT501	DSC-9 Mobile Application Development	4		4		30	70	100
BIT502	DSC-10 Operating Systems	4		4		30	70	100
BIT503	SEC 3-Introduction to Bigdata and IOT	4		4		30	70	100
BIT504	DSE-5 Digital Marketing & SEO	2		2		30	70	100
	DSE-5 Cloud Computing							
	DSE-5 Enterprise Resource Planning							
	Transdisciplinary Open Electives	2		2			100	100
BIT505	Practical-5		12	6		50	100	150
				24				650

		Semester -6						
Course Code	**Title**	**Teaching Hrs. per week**		**Course Credits**	**University Examination**		**Internal Marks**	**Total Marks**
		Theory	**Practical**		**Duration**	**Marks**		
	Life Skills/ NCC/ NSS	2		2				
BIT601	DSC 11, 12 , SEC-4 Project / Internship		24	18		150	300	450
BIT602	DSE-6 Seminar : Emerging trends, technologies and tools in Computer Science & IT		2	2		30	70	100
	Transdisciplinary Open Electives	2		2			100	100
				24				650

DSC-9: Mobile Application Development

Course Code	**DSC-9**
Course Title	**Mobile Application Development**
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
Purpose of Course	To introduce the most demanding and developing mobile app technology. Fundamentals of android open source technology
Course Objective	• To make students understand fundamentals of mobile app technology. • To make students understand various inbuilt features of android. • To make students understand the android design essentials. • 4. To make students understand android user interface design basics .
Pr-requisite	Fundamentals of web technologies and fundamentals related to mobile OS.
Course Out come	Students will have knowledge about android which is widely used Mobile OS and open source technology and its concepts. Various features of android like Application Design Essentials, User Interface Design Essentials, Use of Common Android APIs, data storage using SQLite and deploying Android application.

Course Content	**Unit-1 :Introduction to Android**
	    1.1 Android - Architecture
	    1.2 Android Application Components
	    1.3 Android Application Directory Structure
	
	Unit-2 : Android Application Design Essentials
	    2.1 Understanding the IDE – Emulator/ AVD, logcat,Gradle, SDK
	    2.2. Android Activity Lifecylce
	    2.3 Application Context and Activity Context
	    2.4 Android Manifest File and its common settings
	    2.5 Intent and Intent Filter
	
	Unit-3 : Android User Interface Design Essentials
	    3.1 UI elements – EditText, TextView, Button, RadioButton, CheckBox, listview
	    3.2 Designing User Interfaces with Layouts
	        3.2.1 Relative Layouts
	        3.2.2 Linear Layouts
	        3.2.3 Constraint Layouts
	
	Unit-4 : Advanced Designing Interface
	    4.1 WebView
	      4.2 SearchView
	    4.3 Spinner
	      4.4, Recyclerview
	
	Unit-5 : Menus and Dialog Box
	    5.1 Menus – Context menu, Pop-up menu, Option menu
	    5.2 Toast Message and Alert Dialog box

	Unit-6 : Using Sharedprefernces
	    6.1 Purpose of Shred Preferences
	    6.2 Shared Preference Modes
	    6.3 Writing to shared Preferences
	    6.4 Methods of editor class
	    6.5 Reading from Shared Preference
	
	Unit-7 : Preserving and Saving data in Local Database
	    7.1 Introduction to SQLite
	    7.2 SqliteOpenHelper Class
	    7.3 SQlite Methods - ExecSQL, Rawquery, Insert, Update, Delete
	
	Unit 8: SqlServer connection with android app
	    8.1 Connecting to the MS Sql Server
	    8.2 Storing and Retrieving data in MS Sql Server

Text and Reference Literature	1. Professional Android 4 Application Development Reto Meier, WROX Publication-2015
	2. Professional Android 4 Application Development Reto Meier, WROX Publication-2015
	3. Android for Programmers-An App Driven Approach, Deitel, Deitel,
	   Deitel and Morgano, Pearson Publication-2012
	4. Android Programming Unleashed, Harwani, Pearson Publication-2013
	5. Professional Android Programming-with MONO McClure,
	   Blevins, Croft, Dick and Hardy, Wiley India-2012
	6. Android application development for java programmer, James C Sheusi,
	   Cenage Learning-2013
	7. Android Essentials, Chris Haseman, Apress Publication, 2009
	8. Beginning Android, Mark L Murphy, Wiley India Pvt Ltd, 2009
	9. Pro Android, Sayed Y Hashimi and Satya Komatineni, Wiley India PvtLtd, APress-2009

Teaching Methodology	The course is composed of Lectures, assignments and a group project.
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 30% assessment is based on end semester written examination

DSC-10: Operating Systems

Course Code	**DSC-10**
Course Title	**Operating Systems**
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
Purpose of Course	Conceptualize the students with the theoretical concepts of Operating System
Course Objective	Familiarization with different objectives of operating system components like process management and inter-process communication; Experiments on process scheduling and other operating system tasks through simulation/implementation under a simulated environment
Pr-requisite	Fundamentals of Computer Organization and Operating System
Course Out come	• Describe the various components of Operating Systems. • Case study of Unix operating systems to analyze the different services provided by UNIX Operating System • Design and implement various system calls and concurrent processes requiring synchronization.
Course Content	**Unit- 1: Operating System Concepts** 1.1. Operating system fundamental and its types 1.2. Components of operating system 1.3. BIOS, Booting process and kernel 1.4. Functions of operating systems 1.5. Interrupt and System call, Data bus and Address bus **Unit- 2: I/O Device and File Management** 2.1 I/O Devices, Device controllers and drivers, DMA, Programmed I/O, Interrupt driven I/O, I/O using DMA 2.2 Disk space Management 2.3 Allocation and Disk Arm Scheduling Methods (FCFS, SSTF, SCAN, C-SCAN) 2.4 Drivers for different devices. **Unit- 3: Files structure** 3.1 File storage mechanism, File allocation table, Directory and File structure, Attributes, Types, Access, Operations, Protection, and sharing and remote access. 3.2 File system management and optimization - Disk space management, backup, consistency, Performance, Defragmentation **Unit- 4: Memory Management** 2.1 Address space, Contiguous and non contiguous allocation, Managing free space

2.2 Virtual memory - Paging, Page size, Page table, Page fault, Demand Paging, Page replacement algorithms (FIFO, LRU, 2nd Chance NRU Optimal), Shared page

2.3 Segmentation - Implementation of pure segmentation, segmentation with paging.

Unit- 5: Process Management

5.1 Process, Process states, PCB, Process scheduling

5.2 Scheduling Algorithms

5.3 Study of Round-robin, FCFS, SJF, SRTF and priority algorithms

5.4 Overview of deadlock

5.5 Deadlock avoidance, prevention and recovery

5.6 Overview of Inter process communication

5.7 Deadlocks - Overview of Deadlock Avoidance, Prevention and Recovery

Unit- 6: Security and Protection in operating systems

6.1 Main features of security and protection

6.2 Different security concerns

6.3 Ways available in OS to protect the the system

6.4 Inbuilt security features of operating system.

6.5 Group policy

Unit- 7: Introduction to Unix operating system

7.1 Introduction: History of Unix, features

7.2 Unix system architecture and kernel

7.3 Unix command format, Unix internal and external commands, Directory commands, File related commands, Disk related commands, general utilities.

Unit- 8: File, Process and memory management in Unix operating systems

8.1 Unix File System: Boot inode, super and data block, in-core structure, Directories, conversion of pathname to inode, inode to a new file, Disk block allocation.

8.2 Process Management in unix: Process state and data structures of a Process, User vs, kernel node, context of a Process, background processes, Process scheduling commands, Process terminating and examining commands.

8.3 Storage Management in unix: Formatting, making file system, checking disk space, mountable file system, disk partitioning, file compression. Special Tools and Utilities: Filters, Stream editor SED and AWK, Unix system calls and library functions, Processes, signals and Interrupts, storage and compression facilities.

8.4 Basic shell Programming concepts.

Text and Reference Literature	1. Silberschatz, Korth, Sudarshan ,Database System Concepts, McGraw-Hill computer science series 2. C J Date, An introduction to Database Systems, Addition-Wesley 3. Nilesh shah, Database System using Oracle, PHI. 4. Ramez Elmasri & Shamkant B. Navathe, Fundamentals of Database Systems, Addison-Wesley 5. Hector Gracia-Molina, Jeffrey D. Ullman, and Jennifer Widom, Database System Implementation, Pearson. 6. Ivan Bayross, SQL, PL/SQL, BPB Publications 7. Scott Urman, Oracle9i PL/SQL programming, McGraw-Hill
Teaching Methodology	The course is composed of Lectures, assignments and a group project.
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 30% assessment is based on end semester written examination

SEC-5 : Introduction to Bigdata and IoT

Course Code	**SEC-5**
Course Title	**Introduction to Bigdata and IoT**
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
Purpose of Course	To provide comprehensive knowledge about data science and big data
Course Objective	To provide the student sufficient knowledge about fundamental concepts of big data, data analysis and processing.
Pr-requisite	Knowledge about database system and processing concepts
Course Out come	After having completed the course the student will gain: • Understanding of BIG DATA Fundamentals and Principals • Knowledge of Big Data Analysis Process • Technical know-hows about big data processing • Learning of Big Data Technology stack
Course Content	**Unit 1 Basic Concepts of Big Data** 　　1.1 Concepts and Terminology -Datasets, Data Analysis 　　1.2 Type of Data Analytics - Descriptive, Diagnostic, Predictive, Perspective 　　1.2 Big Data Characteristics - Volume, Velocity, Variety, Veracity, Value 　　1.3 Different Types of Data- Structured, Semi-Structured, Unstructured, Metadata 　　1.4 Big Data Application and Case Studies 　　1.5 Big Data vs Traditional Data Mining 　　1.6 Big Data Concerns – 　　　　1.6.1 Data Procurement 　　　　1.6.2 Data Privacy 　　　　1.6.3 Data Security 　　　　1.6.4 Data Provenance **Unit 2 Big Data Development process** 　　2.1 Big Data Analytics Lifecyle 　　　　2.1.1 Business Case Evaluation 　　　　2.1.2 Data Identification 　　　　2.1.3 Data Acquisition & Filtering 　　　　2.1.4 Data Extraction 　　　　2.1.5 Data Validation & Cleansing 　　　　2.1.6 Data Aggregation & Representation 　　　　2.1.7 Data Analysis 　　　　2.1.8 Data Visualization - Features of Data Visualization tools for Big Data 　　　　2.1.9 Utilization of Analysis Results 　　2.2 Case Study of Big Data - traffic monitoring such big systems **Unit 3 Big Data Analysis Techniques** 　　3.1 Quantitative Analysis 　　3.2 Quantitative Analysis

| | 3.3 Statistical Analysis - A/B Testing, Simple and multiple Corelation, Linear Regression
3.4 Machine Learning- Supervised and Unsupervised
3.5 Semantic Analysis – NLP, Text Analysis, Sentiment Analysis
3.6 Visual Analysis – HeatMaps, Time Series Plots, Network Graphs, Spatial Data Mapping

Unit 4 The Bigdata Technologies
    4.1 Bigdata and Distrubted Computing Challenges
    4.2 Hadoop Fundamentals
        4.2.1 Features of Hadoop
        4.2.2 Advantages of Hadoop
        4.2.3 Versions
    4.3 Overview of Hadoop Ecosystem
    4.4 Hadoop versus SQL, RDBMS
    4.5 Cloud based Hadoop Solutions

Unit 5 Introduction to The Internet of Things
    5.1 The Internet of Things Conceptual Overview
    5.2 Components of IoT
    5.3 Characteristics of IoT
    5.4 Challenges in realizing IoT applications
    5.5 Big Data Anaytics as Complementary Technology of IoT

Unit 6 Embedded Computing Basics
    6.1 Embedded system components
    6.2 Flavours of Microcontroller : 8-bit microcontroller: 8051, 32 bit microcontroller: ARM
    6.3 System on chips concept
    6.4 Embedded system applications

Unit 7 Overview of Arduino
    7.1 Introduction to Arduino
    7.2 Flavours of Arduino
    7.3 Components of Arduino board
    7.4 Arduino Power supply, Breadboard

Unit 8 Programming with Arduino
    8.1 Installing Arduino Desktop IDE
    8.2 Installing Board drivers, configuring board type, sketch
    8.3 Hardware interfacing & programming
        8.3.1. LED on/off using timer
        8.3.2. Working with sensors
        8.3.3. Arduino Traffic Light Controller |
| **Reference books:** | 1. Big Data Fundamentals : Concepts, Drivers & Techniques ,by Thomas Erl, Wajid Khattak, Paul Buhler Publisher :Pearson
2. Big data and Analytics , Seema Acharya, Subhashini Chellappan, Wiley
3. Big Data : Principal and Practice of scalable real time data systems by Nathan Marz, James Warren Publisher : Dreamtech Press
4. Hadoop The Definitive Guide by Tom White Publisher : O'relliy |

	5. BIG DATA by Viktor Mayor Schonberger and Kenneth Cukier Publisher : John Murray 6. INTERNET OF THINGS by Sandeep Vishwakarma, Kiran Gurbani, Nitesh Shukla Publisher : Himalaya Publishing House 7. IoT & Applications I.A. Dhotre Technical Publication 8. Designing the Internet of Things Adrian McEwen and Cassimally Wiley 9. The Internet of Things Connection objects to web Edited by Hakima Chauchi Wiley 10. Introduction to Embedded System -By Shibu K V , McGrawHill 11. Getting Started with Internet of Things –By Cuno Pfister, O'Reilly 12. Learning Internet of Things-By Peter Waher , Packt Publication 13. Internet of Things : A Hands on Approach – By Arshdip Bahga and Vijay Madisetti 14. "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
Teaching Methodology	The course is composed of Lectures, assignments and a group project.
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 30% assessment is based on end semester written examination

DSE-5: Digital Marketing & SEO

Course Code	**DSE-5**
Course Title	Digital Marketing & SEO
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
Purpose of Course	To provide comprehensive knowledge about theory behind Search Engine Optimization and search engine working.
Course Objective	To provide the student sufficient knowledge to learn steps, need ,execute and evaluate the Search Engine Optimization initiatives and prepare them for Digital Marketing.
Pr-requisite	Fundamental Knowledge about Web Development, Searching Technologies and Metadata.
Course Out come	After completion of this course, the student will gain comprehensive knowledge of Search engines and their working and various search engine optimization techniques and will be ready to work in the field of Digital Marketing

Course Content	**Unit 1 Search Engine and Ecommerce**
	   1.1 Mission of Search Engine
	   1.2 Human Goals of Searching, Determining searcher intent.
	   1.3 Challenges for Marketer and search engine
	   1.3.1 People search,
	   1.3.2 Search engine drive ecommerce on web
	   1.4 Eye Tracking:- User Scans Results pages, Click Tracking
	
	Unit 2 Search Engine Basic, SEO objectives
	   2.1 SEO Objectives
	   2.2 Anatomy of a Search Engine
	   2.2.1 Query interface
	   2.2.2 Crawlers, spiders, and robots
	   2.2.3 Databases
	
	Unit 3: Site Development Process
	
	   3.1. Identifying Site Development Process
	   3.1.1 Defining Site information Architecture
	   3.1.2 Auditing current site and Identify SEO problem
	   3.1.3 Identifying Current Server Statistics Software
	   3.1.4 Determine Top Competitor
	   3.2 Theory of Keyword Search
	   3.2.1 Keyword Research Tools
	   3.2.2 Leveraging of Long Tail of Keyword Demand
	   3.2.3.Keyword Demand :- Seasonality, Trending, Seasonal Fluctuation

	Unit 4 Tracking the Result and Measuring Success
	    4.1 Measuring Success of SEO Process
	    4.2 Measuring Search Traffic
	    4.3 SEO Tools - Google Webmaster Tools and Google Analytics
	
	Unit 5: Google Webmaster and analytics tools
	    5.1. Google Webmaster Tools - Webmaster Tools Setup, Dashboard, The "Site configuration" Section, The "Your site on the web" Section, The Diagnostics Section
	    5.2. Google Analytics- Installation and Setup, Navigating Google Analytics, Dashboard, Traffic Sources, Content, Goals, Google Analytics Shortcomings
	
	 Unit 6 Digital Marketing Fundamentals
	    6.1 Marketing v/s Sales, Inbound v/s Outbound marketing
	    6.2 Content marketing, Strategic flow for marketing activities Understanding Leads
	    6.3 Facebook Marketing Fundamentals
	    6.3.1 Profiles and Pages, Business Categories
	    6.3.2 Creating Facebook Pages, Page Info and Settings , Facebook Page Custom URL, Invite Page Likes
	    6.3.3 Facebook Events, Facebook Insights Reports
	    6.4 Affiliate marketing
	
	Unit 7 YouTube Marketing
	    7.1 Video Flow
	    7.2 Google Pages for YouTube Channel
	    7.3 Verify Channel and Linking Custom Channel URL
	    7.4 Uploading Videos, Uploading Defaults Creator Library, Live Broadcasting and Practical Examples
	
	Unit 8: Email Marketing
	    8.1. Email Marketing,
	    8.2. Content writing,Email Software and Tools

Reference books:	1. The Art of SEO : Mastering Search Engine Optimization by Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola O"REILLY Publication 2nd edition 2. The Art of SEO : Mastering Search Engine Optimization by Eric Enge,Stephan Spencer, Rand Fishkin, Jessie C Stricchiola O"REILLY Publication 3nd edition 3. SEO Search Engine Optimization Bible by Jerri L Ledford 2nd Edition Wiley,India 4. SEO Warrior : Essential Techniques for Increasing Web Visibility by John I Jerkovic O"ReillyPublictation 5. Search Engine Optimization For Dummies by Peter Kent John Wiley and Son 5th Edition 6. Digital Marketing -by Seema Gupta. McGrawHill, Second Edition 7. The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted,and Measurable Online Campaigns by Ian Dodson , Wiley Publication 8. Digital Marketing For Dummies by Russ Henneberry, Ryan Deiss, For

	Dummies Publication
Teaching Methodology	The course is composed of Lectures, assignments and a group project.
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 30% assessment is based on end semester written examination

DSE-5: Enterprise Resource Planning (Elective)

Course Code	**DSE-5**
Course Title	**Enterprise Resource Planning**
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
Purpose of Course	Purpose of the management information system is to increase the value and profits of the business. To make effective decisions within a shorter period of time with timely and appropriate information manage by managers.
Course Objective	• To learn the basic concepts of ERP. • To learn different technologies used in ERP. • To learn the concepts of ERP Manufacturing Perspective and ERP Modules. • To learn what are the benefits of ERP • To study and understand the ERP life cycle. • To learn the different tools used in ERP.
Pr-requisite	Concept of Information System
Course Out come	• Understand the basic concepts of ERP. • Identify different technologies used in ERP. • Understand and apply the concepts of ERP Manufacturing Perspective and ERP Modules. • Discuss the benefits of ERP • Understand and implement the ERP life cycle. • Apply different tools used in ERP.
Course Description:	The course gives students an idea about Enterprise Data Management and ERP. ERP life cycle and various case study gives the understanding about ERP. Also brief idea about E-business provides the knowledge about business design.
Course Content	**Unit 1: An Overview of Enterprise resource planning** 1.1 Enterprise – An Overview Integrated Management Information, 1.2 Business Modeling, 1.3 Integrated Data Model 1.4 ERP Life Cycle **Unit 2: ERP Technologies** 2.1 Business Processing Reengineering(BPR), 2.2 Data Warehousing, Data Mining, On-line Analytical Processing(OLAP), 2.5 MIS - Management Information System, 2.6 DSS - Decision Support System, 2.7 EIS - Executive Information System **Unit 3: ERP Modules** 3.1 Supply Chain Management (SCM),

	3.2 Customer Relationship Management(CRM),
	3.3 Plant Maintenance,
	3.4 Quality Management,
	3.5 Materials Management.
	Unit 4: ERP Manufacturing Perspective
	4.1 MRP - Material Requirement Planning,
	4.2 BOM - Bill Of Material,
	4.3 MRP - Manufacturing Resource Planning,
	4.4 DRP – Distributed Requirement Planning,
	4.5 PDM - Product Data Management. Finance,
	Unit 5: EPR Security
	5.1 Managing ERP Securities:
	5.1.1 Types of ERP security Issues,
	5.1.2 System Access security,
	5.1.3 Data Security and related technology for managing data security
	Unit 6: Extended ERP and security issues
	6.1 Enterprise application Integration (EAI),
	6.2 Open source ERP,
	6.3 Cloud ERP
	Unit 7: E-Commerce to EBusiness
	7.1 E-Business structural transformation, Flexible Business Design, Customer Experience
	7.2 Enterprise resource planning the E-business Backbone Enterprise architecture, planning
	7.2 E- Governance, Developing the E-Business Design
	Unit 8: Cases of ERP for Enterprises
	8.1 Cases of ERP
	8.2 Oracle ERP Implementation at Maruti Suzuki.
	8.3 Need of ERP for Small and Medium size enterprises
Reference books:	1. V.K. Garg & N.K. Venkatakrishnan, Enterprise Resource Planning: concepts & practices, by ; PHI.
	2. Supply Chain Management Theories & Practices: R. P. Mohanty, S. G. Deshmukh, – Dreamtech Press.
	3. Enterprise wide resource planning: Theory & practice: by Rahul Altekar, PHI
	4. Customer Relationship Management, Concepts and cases, Second Edition.
	5. Enterprise Resource Planning - Alexis Leon, Tata McGraw Hill.
	6. Enterprise Resource Planning – Diversified by Alexis Leon, TMH.
	7. Enterprise Resource Planning - Ravi Shankar & S. Jaiswal , Galgotia.
Teaching Methodology	The course is composed of Lectures, assignments and a group project.
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.
	30% assessment is based on end semester written examination

DSE 5: Cloud Computing (Elective)

Course Code	DSE 5
Course Title	**Cloud Computing**
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	
Purpose of Course	The course gives students an idea about Cloud Computing fundamentals and Cloud Based Systems.
Course Objective	To provide comprehensive knowledge of cloud computing and aspects related to it.
Pre-requisite	Basic understanding of operating system and computer network
Course Out come	After completion of this course, the student will gain comprehensive knowledge of Cloud based systems and aspects related to it
Course Content	**Unit 1 Introduction to Cloud Computing** 　1.1 Overview, Roots of Cloud Computing, 　1.2 Layers and Types of Cloud, 　1.3 Benefits and Disadvantages of Cloud Computing, 　1.4 Cloud Infrastructure Management, 　1.5 Challenges and Risks **Unit 2 Cloud Fundamentals** 　2.1 Cloud characteristics-On Demand Service 　2.2 Ubiquitous Network Access, 　2.3 Location Independent Resource Pooling, Rapid Elasticity. 　2.4 Cloud Types-Public, Private, Hybrid, Community, Shared Private, Dedicated Private **Unit 3 Cloud Computing Essentials** 　3.1 Cloud Computing Architectural Framework 　3.2 Cloud Deployment Models 　3.3 Virtualization in Cloud Computing 　3.4 Parallelization in Cloud Computing 　3.5 Security for Cloud Computing **Unit 4 Cloud Service Models** 　4.1 Exploring the Cloud Computing Stack, 　4.2 Infrastructure as a Service 　4.3 Server virtualization 　4.4 Storage virtualization 　4.5 Network virtualization 　4.6 Platform as a Service (PaaS) 　　4.6.1 Azure 　　4.6.2 Goole AppEng 　　4.6.3 Hadoop

	4.6.4 SalesForce
	4.7 Software as a Service (SaaS)-Characteristics, Open SaaS and SOA
	    4.7.1 Cloud services
	    4.7.2 Web portal
	    4.7.3. Web OS
	
	Unit 5 Other Cloud Service Models
	    5.1 Identity as a Service(IDaaS)
	    5.2 Network Identity Service Classes
	    5.3 IDaaS Interoperability-user authentication, Authorization MarkUp
	        Languages
	    5.4 Compliance as a Service(CaaS)
	
	Unit 6 Abstraction and Virtualization
	    6.1 Introduction to Virtualization Technologies,
	    6.2 Load Balancing and Virtualization,
	    6.3 Understanding Hyper visors,
	    6.4 Types of Virtualization
	    6.5 Virtualization of CPU, Memory, I/O Devices
	    6.6 Virtual Clusters and Resource management
	
	Unit 7 Cloud Resource Management
	    7.1 Inter Cloud Resource Management,
	    7.2 Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources.
	    7.3 Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards
	
	Unit 8 Cloud Security
	    8.1 Security Overview, Cloud Security Challenges and Risks,
	    8.2 Software-as-a- Service Security,
	    8.3 Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data

Reference Book	1.Cloud Computing: Principles and Paradigms - R. Buyya et al - Wiley 2010 2.Cloud Computing : Principles Systems and Application - L Gillam et al - Springer 2010 3.Cloud Computing Bible - Sosinsky - Wiley - India, 2011 4.Cloud Computing Second Edition Dr. Kumar Saurabh - Wiley - India, 2012 5.Cloud Computing - Insight into New Era Infrastructure - Dr Kumar Saurabh - Wiley India 2012
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 30% assessment is based on end semester written examination

Practical-5

Course Code	
Course Title	**Practical-5**
Credit	12
Teaching per Week	12 Hours
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	---
Purpose of Course	The purpose of course is to make students aware with practical implementation of concept learnt in theory subjects.
Course Objective	To provide Fundamental knowledge of practical implementation based on DSC-9,DSC-10 and SEC-3
Pre-requisite	---
Course Out come	Student should be able to demonstrate skills mentioned in DSC-9,DSC-10 and SEC-3 practically.
Teaching Methodology	demonstration of laboratory work and Practical assignments are provide
Evaluation Method	70% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 30% assessment is based on semester end written examination