

Master of Science (Computer Application)

Name of Program	Master of Science (Computer Application)
Abbreviation	MSC(CA)
Duration	2 Years (Regular)
Eligibility	Candidate must have passed Bachelors Degree in Computer Science / Computer Application / Information Technology / Computer Engineering / equivalent degree in Computer / IT field.
Objective of Program	The Objective of the program is to impart knowledge of advanced and/or latest theories, concepts, methods, techniques and tools related to various areas of Computer Science, Applications and Information Technology and specifically in the area of Mobile based, cloud based & Web based Application Development, Software Engineering and Data Management.
Program Outcome	At the successful completion of the program, students will be able to start their career in the Information Technology industry.
Program Structure	Semester 1

Course Code	Title	Teaching per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
101	Advanced Data Structures	4	0	4	3 Hrs	70	30	100
102	Advance Database Management System	4	0	4	3 Hrs	70	30	100
103	Fundamentals of Web Client Technologies.	4	0	4	3 Hrs	70	30	100
104	Enterprise Data Management and ERP	4	0	4	3 Hrs	70	30	100
105	Web Programming Using Java	4	0	4	3 Hrs	70	30	100
106	Project in Web Programming Using Java	0	6	6	Presentati on & Viva Voice	70	30	100
107	Practical on Web Client Technologies	0	2	2	2 Hrs	70	30	100
108	Practical on Advance Database Management System	0	2	2	2 Hrs	70	30	100

Semester -2								
Course Code	Title	Teaching per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
201	Service Oriented Architecture	4	0	4	3 Hrs	70	30	100
202	Web Programming Using C#	4	0	4	3 Hrs	70	30	100
203	Advanced Software Engineering	4	0	4	3 Hrs	70	30	100
204	Data Warehousing and Data Mining	4	0	4	3 Hrs	70	30	100
205	Information Security	4	0	4	3 Hrs	70	30	100
206	Project in C#	0	6	6	Presentati on & Viva Voice	70	30	100
207	Practical on Data Mining	0	2	2	2 Hrs	70	30	100
208	Practical on Information Security	0	2	2	2 Hrs	70	30	100

NOTE: Batch size for Laboratory work will be 20 students per batch.

Course: 101: Advance Data Structure

Course Code	101
Course Title	Advance Data Structure
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	The purpose of the course is to make student capable of understand the data structures and its working
Course Objective	To provide a comprehensive knowledge of Data Structures concept and their implementation
Pr-requisite	Preliminary knowledge of Data Structure and its classification
Course Out come	After completion of this course, the student will be capable of implementing various advance data structures and algorithms.
Course Content	<p>Unit 1. Algorithm Patterns and Problem Solvers</p> <p>1.1 Brute-Force and Greedy Algorithms 1.2 Backtracking algorithm - Depth-First, Branch and Bound 1.3 Top-Down Algorithms - Divide-and-Conquer 1.4 Bottom-Up Algorithms</p> <p>Unit 2. Graphs</p> <p>2.1 Basics 2.2 Traversals and search - Depth-First, Breadth-First , Branch and Bound 2.3 Applications- Topological Sort 2.4 Shortest Path Algorithm 2.5 Spanning Tress 2.6 Minimum Cost Spanning trees - Prim's and kruskal's algorithm 2.7 Critical Path Analysis</p> <p>Unit 3 Trees</p> <p>3.1 Basic Concepts 3.2 Binary Trees 3.3 N-ary Trees 3.4 Tree Traversals 3.4.1 Inorder, Preorder and Postorder 3.4.2 Search Trees 3.4.2.1 Algorithms like Binary, AVL, B-Tree, B+Tree 3.5 Huffman trees and Data compression including Huffman Coding</p> <p>Unit 4 Hashing</p> <p>4. 1 Basic Idea - Keys and Hash Functions including Collision avoidance 4.2 Hashing Methods 4.2.1 Division Method 4.2.2 Middle Square Method 4.2.3 Multiplication Method 4.2.4 Fibonacci Hashing 4.3 Hash Function Implementations 4.3.1 Integral Keys 4.3.2 Floating Point Keys 4.3.3 Character String Keys 4.3.4 Hashing Containers</p>

	<p>4.3.5 Using Associations</p> <p>4.4 Abstract Hash Tables</p> <p>4.5 Scatter Tables</p> <p>4.5.1 Chained Scatter Table</p> <p>4.5.2 Scatter Table using Open Addressing Hashing</p> <p>Unit 5 Heaps and Garbage Collection</p> <p>5.1 Basic Concepts Heaps</p> <p>5.2 Binary, Leftist, Binomial Queues</p> <p>5.3 Recent Applications</p> <p>5.4 Basic concepts of Garbage Collection -</p>
Reference Book	<p>1 . Data Structures and Algorithms Alfred V. Aho, Jeffrey D Ullman, John E . Hopcroft, Addison-Wesley Oracle press</p> <p>2. Data Structures and Algorithms with Object-Oriented Design Patterns in Java By Bruno R Presis</p>
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course : 102 :Advance Database Management System

Course Code	102
Course Title	Advance Database Management system
Credit	4 credit
Teaching per Week	4 Hrs
Minimum weeks perSemester	15(Including Classwork,examination,preparation,holidays etc.)
Review / Revision	June2016
Purpose of Course	The purpose of the course is to make student capable of understand internal of relational database system and its architecture
Course Objective	To Provide Comprehensive knowledge of Database Architecture and Administration
Pr-requisite	Design and PL/SQL
Course Out come	After completion of this course, the student will gain comprehensive knowledge Database architecture and database administration
Course Content	<p>Unit -1 SQL/PL/SQL</p> <ul style="list-style-type: none">1.1 Various SQL statements, Various typed of joins, Nested Subqueries and Complex queries1.2 Views, Integrity Constraints, Cursors1.3 SQL Functions, Procedures and Triggers1.4 Package1.5 Collections & Objects1.6 Indexes - Simple Index, Composite Index, Bitmap Index, Function Based Index, Key Compressed Index1.7 Sequences & Pseudo columns - CURRVAL & NEXTVAL, LEVEL, ROWID, ROWNUM1.8 Transaction Control Statements - Commit, Savepoint Rollback <p>Unit-2 Transaction Management</p> <ul style="list-style-type: none">2.1 Transaction Concept & State2..2 Implementation of Atomicity and Durability2.3 Concurrent Executions <p>Unit-3 Overview of Database Server Architecture</p> <ul style="list-style-type: none">3.1 Architecture of Database and Database Instance3.2 Overview of Physical and Logical Structures3.3 Dedicated and Shared Server Configuration3.4 Server Startup and Shutdown3.5 Database Instance Creation and Management<ul style="list-style-type: none">3.5.1 Database Instance3.5.2. Installing Database System3.5.3 Database Architecture3.5.4 Locating initialization, listener.ora & sqlnet.orafiles3.5.5 Finding the alert log3.5.6 Common environment variables3.5.7 Structures in an Database Instance3.5.8 Memory Structures3.5.9 Processes and their purposes3.5.10 commands for database startup, mount and open database

	<p>3.6 Database Creation</p> <ul style="list-style-type: none"> 3.6.1 Database management framework 3.6.2 Using the Database Creation Assistant 3.6.3 Creating and dropping a database 3.6.4 Tablespaces 3.6.5 Tables and Indexes 3.6.6 Clusters <p>Unit 4 Database Administration and Database User Management</p> <p>4.1 Managing Users</p> <ul style="list-style-type: none"> 4.1.1 User Authentication Methods <ul style="list-style-type: none"> 4.1.1.1 Password Authentication 4.1.1.2 O.S Authentication 4.1.2 User Configuration Setup <ul style="list-style-type: none"> 4.1.2.1 Profiles 4.1.2.2 Default Table space 4.1.2.3 Temporary Table space 4.1.3 Resource Management <ul style="list-style-type: none"> 4.1.3.1 Quotas 4.1.4 Working with user database account <ul style="list-style-type: none"> 4.1.4.1 Creating, Modifying and deleting user account 4.1.4.2 Changing password <p>Unit 5 Database Backup Recovery and security</p> <p>5.1 Backup & Recovery</p> <ul style="list-style-type: none"> 5.1.1 Types of Backup -Control file, Redo log file, cold and hot backup 5.1.2 Types of Database failures 5.1.3 Recovery Methods- Cold Restore, full Database Recovery, Time based recovery <p>5.2 Database Security</p> <ul style="list-style-type: none"> 5.2.1 Authentication 5.2.2 Privileged Accounts & Privileges 5.2.3 Introduction to Object Security and System security 5.2.4 Database Roles 5.2.5 Introduction to Database Auditing
Reference Book	<ol style="list-style-type: none"> 1. Database System Concepts Silberschatz Henry F. Korth and S. Sudarshan McGraw-Hill 2. Oracle DBA Fundamentals-I - Oracle Press 3. Effective PL/SQL – Apress 4. Expert Oracle Database Architecture 9i and 10g Tom Kyte Apress 5. Effective Oracle By Design Tom Kyte Oracle Press 6 Expert Oracle Database 11g Administration Alpati Wiley Student

	<p>Edition</p> <p>7. SQL & PL/SQL for Oracle 11g Black Book Deshpande Wiley Student Edition</p> <p>8. Beginning Oracle Database 11g Administration from novice to professional Iggy Fernandez Apress/Springer</p> <p>9. Oracle PL/SQL Example, Benjamin Rosenweig & Elena Silvestrova 4/e, Pearson</p> <p>10. Database Systems Using Oracle: A simplified guide to SQL & PL/SQL Shah Nilesh PHI</p> <p>11. Learning Oracle SQL & PL/SQL: A Simplified Guide Chatterjee, Rajeeb C PHI</p>
Teaching Methodology	Discussion, Independent Study, Seminars / 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 end semester written examination

Course: **103 Subject: Fundamentals of Web Client Technologies**

Course Code	103
Course Title	Fundamentals of Web Client Technologies
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	The purpose of course is to make students capable of developing effective and interactive web client part of web applications.
Course Objective	To provide an Fundamental knowledge of Web client development technologies
Pr-requisite	Basic understanding of Web, HTTP, HTML, JavaScript and Object Oriented Concepts.
Course Out come	After completion of this course, the student will be capable of developing effective and interactive web client part of web applications.
Course Content	<p>Unit 1 HTML5</p> <ul style="list-style-type: none"> 1.1 Features, Syntax, New tags, standard and custom attributes, events 1.2 Web Form 2.0, Web storage, Web SQL, 1.3 SVG, Canvas, Embedding and Playing Audio & Video, Geo-location <p>Unit 2 Cascade Style Sheets</p> <ul style="list-style-type: none"> 2.1 Creating CSS and using it with HTML. <ul style="list-style-type: none"> 2.1.1 Common Tasks with CSS-styling fonts, margins, links with Background related tags, Border related tags, Font related tags, Margin related tags, Text related tags, Page related tags, List related tags, Colour tag, Layer tag, Size and location related properties, 2.1.2 Assigning classes <p>Unit 3 JavaScript</p> <ul style="list-style-type: none"> 3.1 JavaScript Language constructs & functions 3.2 Working with Browser Objects-Date, Math, String 3.3 Handling events in JavaScript-Windows event, Event object, Event simulation 3.4 Working with Forms & User Actions 3.5 Working with Windows, Frames & Screen objects, 3.6 Working with Document and Navigator Object <p>Unit 4. AJAX, JSON and JQuery</p> <ul style="list-style-type: none"> 4.1 AJAX Web Application Model, AJAX -need, Advantages and Disadvantages 4.2 AJAX Components, AJAX component lifecycle, XMLHttpRequest object 4.3 Introduction to JSON-Datatypes, Objects, Schema, JSON with Java 4.4 Introduction to JQuery- Language Basics , JQuery & DOM - Selectors, Attribute processing , Traversing. JQuery Events, JQuery with CSS & AJAX , JQuery Utilities, Overview of JQuery UI widgets. <p>Unit 5.Bootstrap</p> <ul style="list-style-type: none"> 5.1 Introduction to Bootstrap, Need, Advantages and Disadvantages 5.2 Grid System, Tables, Forms, Buttons, Images, Helper classes, Responsive Utilities

	<p>5.3 Bootstrap Layout Components-Dropdowns, Button Groups, Dropdown Button Groups, Input Groups, Navigation Elements, NavBar, Thumbnails, Pagination, Alerts, Progress bar, List Groups</p> <p>5.4 Bootstrap plugins-Transition, Modal, Dropdown, ScrollSpy, Tab, Popover, Collapse, Carousel, Affix</p>
Reference Book	<ol style="list-style-type: none"> 1. HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery, , Dreamtech Press 2. WEB TECHNOLOGIES: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML AND AJAX, BLACK BOOK: HTML, Javascript, PHP, Java, Jsp, XML and Ajax, Black Book, , Dreamtech Press 3. HTML5 and CSS3 made Simple, Ivan Byross, BPB 4. Pro HTML5 and CSS3 Design Patterns, Dionysios Synodinos, Michael Bowers and Victor Sumner, Pearson 5. HTML5 In easy steps, Mike McGrath, McGrawHill 6. Programming in HTML5 with JavaScript and CSS3 Training Guide, Johnson G, PHI 7. JavaScript in easy Steps, Mike McGrath, McGrawHill. 8. AJAX for beginners, Ivan Byros, Sharanam Shah, SPD. 9. AJAX Bible, Steven Holzner, Wiley India 10. AJAX: Creating Web pages, edmond Woychowsky, Pearson 11. jQuery, jQuery UI and jQuery Mobile, Adriaan de Jonge, Pearson 12. JQuery and JQuery UI, Jay Balchand, Pearson 13. JQuery in Action, Dreamtech Press 14. JavaScript and JSON Essentials, Sai Srinivas Sriparasa, Packt Publishing Limited 15. Introduction to JavaScript Object Notation: A To-the-Point Guide to JSON, Lindsay Bassett, SPD 16. Jumpstart Bootstrap, Syed Fazle Rehman , SPD 17. Extending Bootstrap, Christoffer Niska, Packt Publishing
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course : 104 Enterprise Data Management and ERP

Course Code	104
Course Title	Enterprise Data Management and ERP
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	The course gives students an idea about Enterprise Data Management and ERP
Course Objective	To provide a comprehensive knowledge of the concepts related to Information Systems and modeling of data in these systems.
Pr-requisite	Concept of Information System
Course Out come	After completion of this course, the student will be capable of
Course Content	<p>Unit 1 Data Management and Information System</p> <p>1.1 Data Management</p> <p> 1.1.1 Hierarchy of Data</p> <p> 1.1.2 Data Modelling</p> <p> 1.1.3 Data Integrity</p> <p> 1.1.4 Data Quality</p> <p> 1.1.5 Metadata</p> <p> 1.1.6 Legacy System and Data Migration</p> <p>1.2 Information System</p> <p> 1.2.1 Overview of Information System</p> <p> 1.2.2 Overview of different types of information Systems : MIS,DSS, GDSS,ESS , GIS KSS</p> <p> 1.2.3 Impact of Information System on an organisation</p> <p> 1.2.4 An Introduction to Electronic Commerce and Mobile Commerce</p> <p> 1.2.5 Threats and security to e-commerce and m-commerce</p> <p>Unit 2 Introduction to ERP</p> <p>2.1 Evolution of ERP and Reasons for the growth of ERP</p> <p>2.2 Scenario and Justification of ERP in India</p> <p>2.3 Various Modules Of ERP</p> <p>2.4 Advantage of ERP.</p> <p>2.5 ERP for Small Business</p> <p>2.6 ERP for make to order companies</p> <p>2.7 Business Process Mapping for ERP Module Design</p> <p>2.8 Hardware Environment and its Selection for ERP Implementation</p> <p>Unit 3 ERP Products and Modules</p> <p>3.1. Introduction to ERP Products and modules</p> <p>3.2 Finance Module</p> <p>3.3 Plant Maintenance Module</p> <p>3.4 Quality Management Module</p> <p>3.5 Material Management Module</p> <p>Unit 4 ERP implementation lifecycle</p> <p>4.1 Issues in implementing ERP packages</p> <p>4.2 Pre-evaluation screening</p> <p>4.3 Package evaluation</p> <p>4.4 Project planning phase, gap analysis, reengineering,</p>

	<p>4.5 End-user training, post implementation (Maintenance mode). 4.6 Vendors, Consultants and users, In-House Implementation - pros and cons</p> <p>UNIT 5 Business Intelligence</p> <p>5.1 Introduction to BI 5.2 Types of Business Rule 5.3 Implementing Business Rule 5.4 Business Re-engineering 5.5 Overview of Data Warehousing and Data Mining 5.6 Business Intelligence using Data Warehousing and Data Mining 5.7 Business Intelligence Applications: Customer Relationship Management, Supply Chain Management.</p>
Reference Book	<ol style="list-style-type: none"> 1.Enterprise Resource Planning By Alexis Leon TMH 2.Principles of Information Systems Managerial Approach By Ralph stair and George Reynolds Thomson Course Technology 3.Management Information Systems Managing the Digital Firm by Kenneth Laudon and Jane Laudon by PHI 4.Content Management Bible By Bob Boiko Wiley Publishing House 5.Management Information System Text & Application by C.V.S Murthy by Himalaya Publishing House 6.Management Information System by W.S Jawadekar by TMH 7.Information System for Modern Management by Murdick Ross and Claget Prentice Hill 8.Maximizing your ERP System a Practical guide for Manager by Scott Hamilton Macgraw Hill 9.ERP: Make it Happen By Thomas wakace, Willey Publication 10.ERP : Tools ,Technioques and applications for Integrating the Supply Chain Second Edition by Carl a Ptak, Schragenheim by Willey 11.Enterprise Sales and Operations Planning by E.Palmatier Coleen H,Ross Publishing 12. SAP MM Questions and answers by Learning Solutions and Publication Jones Barllet Learning 13 ERP 100 Sucess secrets By Godfrey 14 Management Information Systems By Gordon B Davis and Margethe H Olson TMGH 15 Management Information System by Sadopan PHI
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course : 105 Web Programming Using JAVA

Course Code	105
Course Title	Web Programming Using JAVA
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	The course gives students an idea about How to use Java in Web Programming
Course Objective	The aim of this course is to provide indepth knowledge about Java Programming Technology
Pr-requisite	Basic Understanding of Web , HTTP, HTML, Javascript programming in Core Java, OOPS concept, DBMS.
Course Out come	After completion of this course, the student will able use JAVA in Web Programming
Course Content	<p>Unit 1 JAVA WEB ARCHITECTURE</p> <ul style="list-style-type: none"> 1.1 The Java Advantage for Web, 1.2 Java EE Web Architecture, 1.3 Java Web Application Servers, <p>Unit 2 JAVA DATABASE PROGRAMMING</p> <ul style="list-style-type: none"> 2.1 The 2-Tier Client Server Architecture, 2.2 Java Dabase Connectivity (JDBC) – API for Accessing Databases, 2.3 Database Drivers, Loading a Driver Class, 2.4 Connecting the Database Server, 2.5 CRUD operations with Statement Object, PreparedStatement Object, callable statement object 2.6 The ResultSet Object 2.7 Data about Data - The ResultSetMetaData Object 2.8 Handling Database Transactions, Batching the Operations <p>Unit 3 JAVA SERVLETS</p> <ul style="list-style-type: none"> 3.1 Introduction to Java Servlets 3.2 The Java Servlet API, 3.3 The Servlet Life Cycle, CGI and Servlets, 3.4 Request and Response 3.5 Getting Values from Forms and QueryStrings, 3.6 Working with Databases, Working with HTTP Headers , 3.7 Using Hidden Fields, 3.9 State Management using cookies and session 3.10 ServletContext and ServletConfig, 3.11 Initalization Parameters, Inter-Servlet Communication with Request 3.12 Dispaching and Forwarding, Filters, Web Listeners 3.13 Writingd deployment Descriptor <p>Unit 4 JAVA SERVER PAGES</p> <ul style="list-style-type: none"> 4.1 Overview of Java Server Pages (JSP) & JSP lifecycle, 4.2 Directives - Page Directive, Include Directive, Taglib Directive 4.3 Scripting Elements-Comment Element, Declaration Element, Scriptlets , Expression Element 4.4 Standard Actions – include, forward, plugins, useBean

	<p>4.5 The Implicit Objects, Handling the HTML Form Submission, 4.6 The Form Validation with Java Bean, 4.7 State Management, Working with databases</p> <p>Unit 5 Enterprise Java Beans and Java Application Framework</p> <p>5.1 Stateless Session Bean , Statefull Session Bean, 5.2 Binding and looking up objects , 5.3 Singleton Beans, Overview of Message Driven Beans 5.4 Local and Remote Lookups, 5.5 Asynchronous EJB Methods 5.6 WEB SERVICES 5.6.1 Types of Web Services 5.6.2 Creating, Publishing and consuming a RESTful Web Service, 5.7 The Java Web Application Frameworks 5.7.1 Action Based Framework – Overview of SPRING 5.7.2 Component Based Framework - JAVA SERVER FACES</p>
Reference Book	<ol style="list-style-type: none"> 1. Head First Servlets and JSP By: Bryan Basham, Kathy Sierra, Bert Bates Publisher: 'Reilly Media ISBN 10: 0-596-00540-7 ISBN 10: 0-596-55633-0 2. Core Servlets and JSP: Author Marty Hall , Larry Brown , Sun Micro System 3. Java Servlet & JSP Cookbook by Bruce W. Perry O;reilly 4. Beginning JSP™, JSF™ and Tomcat™ Web Development: From Novice to Professional by Giulio Zambon and Michael Sekler 5. Mastering Enterprise JavaBeans and the Java 2 Platform, Enterprise Edition, by Ed Roman 6. Java 7 EE Tutorial Basic Concepts by Oracle Corporation 7 Beginning Java™ EE 7 Platform with GlassFish™ 3: From Novice to Professional by Antonio Goncalves 8 . Beginning EJB 3 Application Development From Novice to Professional by Raghu R.Kodali and Jonathan Wetherbee with Peter Zdrozny, Apress Publication 9. Pro JPA 2: Mastering the Java™ Persistence API (Expert's Voice 10 Java Technology) by Mike Keith and Merrick Schincariol, Apress Public
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course: 106 Project in Web programming using Java

Course Code	106
Course Title	Project in Web programming using Java
Credit	6
Teaching per Week	6 hours
Minimum weeks per Semester	15 (Project work, Self-Study, examination, preparation, holidays etc.)
Last Review / Revision	--
Purpose of Course	The purpose of the course is to make students capable of developing professional applications using latest tools and technologies of JAVA.
Course Objective	To expose students to industrial practices and activities of software engineering and train them about the same using JAVA.
Pr-requisite	Knowledge of Advanced Programming, Latest Technologies and Tools and Software Engineering.
Course Out come	After completion of this course, the student will be capable of developing professional applications using latest tools and technologies of JAVA.
Course Content	<p>The project will be in-house mini project that students are supposed to develop in laboratory session allocated for the same . The students must prepare documentation of the project work done as per the software Engineering Guidelines. At the end of the semester, the students have to submit their project report in bounded form to the respective institution. The project presentation and viva – voice will be conducted on the basis of it.</p> <p>The students have to submit the following reports to their respective institution:</p> <ol style="list-style-type: none"> 1. Appropriate name of the project 2. Monthly Progress Report duly sign by the concern internal guide 3. Project Completion Certificate from Institute <p>Without such reports student will not be allowed to appear in his/her final Project Presentation and Viva-Voice</p>
Reference Book	As per Paper:105
Teaching Methodology	LabWork
Evaluation Method	<p>30% Internal assessment is based on project presentation and/or demonstration and viva-voice examination.</p> <p>70% assessment is based Project Presentation and/or demonstration and viva-voice examination at the end of semester.</p>

Course : 107 Practical on Web Client Technologies

Course Code	107
Course Title	Practical Web Client Technologies
Credit	2
Teaching per Week	2Hrs
Minimum weeks perSemester	15(Including Classwork,examination,preparation,holidays etc.)
Review / Revision	June2016
Purpose of Course	The purpose of the course is to make students capable of implementing concepts, methods and tools learnt in course 103 Fundamental of Web Client Technologies .
Course Objective	The Objective of these course is to enable students to develop Client part of web application.
Pr-requisite	Programming Skill in Structured and Object Oriented Programming, Scripting Skills in HTML, Basics of Operating Systems and Database systems, Concepts of Networks, Web, HTTP etc.
Course Out come	After completion of this course, the student will be capable of developing Client part of web application.
Course Content	The students will be required to carry out practical in Fundamental of Web Client Technologies on the topics covered in Paper 103: "Fundamental of Web Clitnt Technologies" using the methods and tools discussed there in. A Journal must be prepared for the practical work done.
Reference Book	As Per Paper 103
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment is based on Practical attendance, Problem Solving , internal examination etc. 70% assessment is based practical examination at the end of semester.

Course : 108 Practical on Advance Database Management System

Course Code	108
Course Title	Practical on Advance Database Management System
Credit	2
Teaching per Week	2Hrs
Minimum weeks per Semester	15(Including Classwork, examination, preparation, holidays etc.)
Review / Revision	June 2016
Purpose of Course	The purpose of the course is to make students capable of performing DBA related tasks.
Course Objective	The Objective of these course is to enable students to writing Advance SQL queries and PL/SQL blocks , create database instance and carry out basic Data Administration in RDBMS
Pr-requisite	Basic understanding of RDBMS, SQL and PL/SQL
Course Out come	After completion of this course, the student will be able to write Advance SQL queries and PL/SQL blocks , create database instance and carry out basic Data Administration in DBMS
Course Content	The students will be required to carry out practical on the topics covered in Paper 102: "Advance Database System " using the methods and tools discussed there in. A Journal must be prepared for the practical work done.
Reference Book	.As per paper 102
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment is based on Practical attendance, Problem Solving , internal examination etc. 70% assessment is based practical examination at the end of semester.

Course: 201: Service Oriented Architecture

Course Code	201
Course Title	Service Oriented Architecture
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	The purpose of course is to establish foundation of service oriented technologies and cloud computing.
Course Objective	To provide in-depth knowledge modern SOA and application of SOA-specific methodologies, technologies and standards
Pr-requisite	Fundamental knowledge of software engineering, basic knowledge of programming, networking and internet
Course Out come	After completion of this course, the student will be capable of identifying, modeling and implementing service based applications and web services.
Course Content	<p>Unit 1 Fundamentals of SOA</p> <p>1.1 Loose Coupling</p> <p>1.1.1 Distributed computing and Problems of interoperability</p> <p>1.1.2 Hardware, Software, and Network Transparency</p> <p>1.1.3 XML for openness, flexibility and loose coupling</p> <p>1.2 Services and Service orientation</p> <p>1.2.1 Line of business services, Reusable Technical Services, Service contracts, web service platform, Service requesters and Service Providers</p> <p>1.2.2 Service characteristics</p> <p>1.3 Need, Characteristics, Benefits and Limitations of SOA</p> <p>1.3.1 Overview of SOA Principles and guidelines</p> <p>1.3.2 Characteristics of SOA – Platform, Location, Protocols, Programming Language, Invocation Patterns, Security, Service Versioning, Service Model, Information Model, Data Format</p> <p>1.3.3 Business and Technical Benefits of SOA</p> <p>1.3.4 Challenges introduced by SOA</p> <p>Unit 2 Introduction to SOA Architecture</p> <p>2.1 Infrastructure Services</p> <p>2.1.1 Resource Virtualization Service</p> <p>2.1.2 Service-Level Automation and Orchestration</p> <p>2.1.3 Utility Business Services.</p> <p>2.2 Enterprise Service Bus – Transport, QoS based Routing, Mediation, Web Services Gateway</p> <p>2.3 SOA Enterprise Software Models - Industry Models, Platform-Independent Realization, Platform Specific Realization, J2EE Realization, Services Integration on Web/Application Server, Server/Service On Demand Operating Environment</p> <p>Unit 3 Introduction to web Services</p> <p>3.1 Web Service Platform- elements and principles, Service Description, Service Discovery, Service Interactions, Service</p>

	<p>composition, Web service Architecture</p> <p>3.2 Service Contracts-elements, definition and documentation, principles, Service-Level Abstractions, WSDL and service contracts-Architecture</p> <p>3.3 Overview of Web Service Technologies-SOAP, WSDL, UDDI</p> <p>3.4 Service-Level Data Model- Service-Level Data Models and Internal Data Models , Reconciliation of data models, XML-Related technologies for Service-Level Data Model</p> <p>3.5 Overview of Service Discovery – Registration and Lookup</p> <p>3.6 Service Level Interaction Patterns-SOAP and HTTP interaction, Request/Response Interactions, Request/Callback Interactions, Asynchronous Store-and-Forward Messaging, Asynchronous Messaging, Publish/Subscribe Interaction</p> <p>3.7 Atomic services and composite services</p> <p>3.8 Generating Proxies and Skeletons from Service Contracts in Java and C#</p> <p>3.9 Service Level Communication and Alternative Transports-WSDL Extensibility, SOAP over IBM WebSphere MQ, SOAP over JMS</p> <p>Unit 4 SOA and web services</p> <p>4.1. Integration-Common business drivers, common technical challenges, requirements for Ideal solution, integration at various layers of technology stack</p> <p>4.2. Integration and Interoperability using XML and Web services</p> <p>4.2.1 Web Services Integration(WSI)</p> <p>4.2.2 Service-oriented Integration(SOI)</p> <p>4.2.3 .Net and J2EE Interoperability</p> <p>4.3. Multi channel Access</p> <p>4.3.1 Business benefits of Multichannel Access</p> <p>4.3.2 SOA Architecture for Multi-channel Access- Client Ties, Channel Access Tier, Communication Infrastructure, Business Service Access Tier, Business Tier</p> <p>4.4. Security</p> <p>4.4.1 Overview of various security threats in SOA</p> <p>4.4.2 Security Policies for Transport security, Message layer Security, Data Protection, Security Tokens, Cryptographic Key</p> <p>4.4.3 Standards and Mechanism for SOA security-WS – Security Standard, WS-Trust, WS-Federation, WS-Secure Conversation, WS-Policy</p> <p>Unit 5 SOA platforms and WS</p> <p>5.1 Overview of SOA support in J2EE – Java API for XML-based web services (JAX-WS) , Java architecture for XML binding (JAXB) , Java API for XML Registries (JAXR) , Java API for XML based RPC (JAX-RPC)</p> <p>5.2 Web Services Interoperability Technologies (WSIT)</p> <p>5.3 SOA support in .NET – Common Language Runtime , ASP.NET web forms , ASP.NET web services ,</p> <p>5.4 Web Services Enhancements (WSE)</p> <p>5.5 Overview of : WS-Coordination, WS-Choreography, WS-Addressing, WS-Routing, WSIF, WS-Transaction</p>
Reference Book	1. Pro Newcomer & Lomow, “Understanding SOA with Web Services”,

	<p>Pearson Education, 2007</p> <ol style="list-style-type: none"> 2. Bieberstein,Bose,Fiammante,Jones and Shah "Service-Oriented Architecture(SOA) Compass", Pearson Education, 2010 3. Alonso, Casati, Kuno andMachiraju, " Web services-concepts, Architectures and Applications", Springer,2009 4. CA, Barai and Caseli, "Service Oriented Architecture with Java",2008 5. Thomas Erl, "Service-Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005. 6. Thomas Erl, "SOA: Principles of Service Design ",Pearson Education, 2009 7. Pulier and Taylor, "Understanding Enterprise SOA", DreamTech, 2008 8. Michael HAVey, "SOA cookbook", SPD, 2008
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course : 202 : Web Programming using C#.Net

Course Code	202
Course Title	Web Programming using C#.net
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2014
Purpose of Course	The purpose of the course is to make students capable of developing professional applications using latest tools and technologies of C#.Net.
Course Objective	To provide an in-depth knowledge of most recent server side programming technology.
Pr-requisite	Basic understanding of Web, HTTP, HTML, JavaScript, Programming in .Net and Object Oriented Concept, DBMS.
Course Out come	After completion of this course, the student will be capable of developing professional applications using latest tools and technologies of C#.Net.
Course Content	<p>Unit 1 ASP.NET using C#</p> <ol style="list-style-type: none"> 1.1 Life cycle of ASP.Net Application on IIS 7.0 & Lifecycle of ASP.Net Web Page 1.2 Structure of Application- Application Domain, Application Lifetime, Application Directory Structure 1.3 Web Forms-Dynamic Compilation, Control Trees, Debugging and Tracing 1.4 Client & Server Side State Management-Application State, Session State, ViewState, Cookies etc. 1.5 HTTP Handlers, Postback and Cross-page Posting <p>Unit 2 Working with Data</p> <ol style="list-style-type: none"> 2.1 Working with ADO.NET 2.2 Database Operations – SqlDataSource, XmlDataSource 2.3 Data Access with LINQ <ol style="list-style-type: none"> 2.3.1 Introduction of LINQ 2.3.2 LinqDataSource control 2.3.3 LINQ to Dataset 2.3.4 Overview of LINQ to SQL 2.4 Overview of ADO.Net Entity Framework <p>Unit 3 Custom controls with User Controls</p> <ol style="list-style-type: none"> 3.1. Creating and Registering User Controls 3.2. Exposing properties and events of a User Control 3.3 Dynamically Loading User Controls 3.4 Overview of Custom Control building 3.5 Overview of creating Template Controls <p>Unit 4 ASP.Net MVC Application</p> <ol style="list-style-type: none"> 4.1 Introduction to ASP.Net MVC Framework 4.2 Building an MVC page 4.3 CRUD operation in MVC <p>Unit 5 Advanced Asp.Net</p> <ol style="list-style-type: none"> 5.1 Configuring Applications <ol style="list-style-type: none"> 5.1.1 Website configuration with Website Administration Tool 5.1.2 Working with ASP.Net configuration Sections 5.1.3 Creating Custom Configuration Sections

	<p>5.2 Overview of ASP.Net Web Services</p> <p>5.3 Fundamental of WCF</p> <p>5.4 Restful WCF Services</p> <p>5.5 Overview of working with ASP.NET AJAX , Ajax control Toolkit, JQuery</p> <p>Self study: Advanced Server Controls</p> <ul style="list-style-type: none"> - Data Binding with Controls - Website Navigation Controls
Reference Book	<ol style="list-style-type: none"> 1. Pro ASP.NET 3.5 in C# 2008– Matthew MacDonald – Apress 2. ASP.NET 4.0 Unleashed – Stephen Walther – Sams 3. Professional ASP.NET 3.5: In C# and VB (Programmer to Programmer)– by Bill Evjen – Wrox 4. Beginning ASP.NET 3.5 in VB 2008– Matthew MacDonald – Apress 5. ASP.Net 4.0 Black Book – dreamtech press 6. Essential Windows Communication Foundation(WCF) : For .Net Framework 3.5 - Steve Resnick - Pearson
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course: 203: Advanced Software Engineering

Course Code	203
Course Title	Advanced Software Engineering
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2014
Purpose of Course	The purpose of the course is to make students capable of understanding and implementing advanced software engineering concepts, approaches and methodologies.
Course Objective	To provide a comprehensive knowledge of advanced Software Engineering methodologies and approaches
Pr-requisite	Basic Concept of Software Engineering.
Course Out come	After completion of this course, the student will be capable of following object oriented; component based and/or web engineering practices and model the systems using UML.
Course Content	<p>1. Object Oriented and Component level Analysis and Design</p> <p>1.1 Object Oriented Analysis & Design</p> <p>1.1.1 Use case model-identifying & refining actors, scenarios and use cases</p> <p>1.1.2 Classification- Identifying Classes, Object relationships, attributes And Methods.</p> <p>1.1.3 Designing Classes & Components- abstraction, encapsulation, reuse, cohesion, coupling</p> <p>1.2 Component-Based Process Model</p> <p>1.2.1 The CBSE Process</p> <p>1.2.2 Domain Engineering</p> <p>1.2.3 Component-based development</p> <p>1.2.4 Component classification, retrieval and reuse</p> <p>1.3 Software Design patterns</p> <p>1.3.1 Design Principles and Techniques</p> <p>1.3.2 Software Architecture</p> <p>1.3.3 Architectural Pattern</p> <p>1.3.4 Other design patterns</p> <p>2. Web Engineering</p> <p>2.1 Attributes of web-based systems and applications, Web Engineering layers, Web Engineering Process</p> <p>2.2 Analysis Model for WebApps</p> <p>2.2.1 Content Model, Interaction Model, Functional Model, Configuration Model,</p> <p>2.2.2 Relationship Navigation Analysis</p> <p>2.3 Design for WebApps</p> <p>2.3.1 Design issues, WebE Design Pyramid,</p> <p>2.3.2 Interface, Asthetic and Content Design</p> <p>2.3.3 Architecture and Navigation Design</p> <p>2.3.4 Component Level Design</p> <p>2.4 Testing WebApps</p> <p>2.4.1 Testing concepts for webApps-quality concepts, Error characteristics, Test planning and Testing strategy, Testing Process</p> <p>2.4.2 Overview of Interface Testing, Content Testing, Component-level Testing</p> <p>2.4.3 Navigation Testing, Configuration Testing, Security Testing, Performance Testing</p>

	<p>2.5 Project Management for Web Engineering- Outsourcing, In-House Web Engineering.</p> <p>3. UML Class and Use-case Diagrams</p> <p>3.1 Class Diagram</p> <p>3.1.1 Class Notation-Static Structure</p> <p>3.1.2 Object Diagram</p> <p>3.1.3 Class Interface Notation</p> <p>3.1.4 Incorporating Associations, Association role, qualifier, multiplicity, Association class, Binary and N-ary Associations, aggregation and Composition Associations, Generalization</p> <p>3.2 Use case Diagrams</p> <p>3.2.1 Scope, Benefits and Elements</p> <p>3.2.2 Identifying Actors, Scenarios and Use cases</p> <p>3.3 A Case Study</p> <p>4. UML Interaction Diagrams</p> <p>4.1 Sequence Diagram - Elements and Guidelines</p> <p>4.2 Collaboration Diagram - Elements and Guidelines</p> <p>4.3 Activity Diagram - Elements and Guidelines</p> <p>4.4 State Chart Diagram - Elements and Guidelines</p> <p>4.5 A Case Study</p> <p>5. UML Implementation Diagrams</p> <p>5.1 Component Diagram –Elements & Guidelines</p> <p>5.2 Deployment Diagram - Elements & Guidelines</p> <p>5.3 A Case Study</p>
Reference Book	<ol style="list-style-type: none"> 1. Software Engineering: A Practitioner's Approach, 6/e Roger S Pressman TataMcGrawHill 2. Software Engineering: A Practitioner's Approach, 7/e Roger S Pressman TataMcGrawHill 3. Web Engineering: A Practitioner's Approach 1/e Roger Pressman, TataMcGrawHill David Lowe 4. Software Engineering Ian Sommerville Pearson Education(Addison-Wesley) 5. Web Engineering Emila Mendes, New Age Information Nile Mosley (Springer) Publication 6. Object Oriented System Development AliBahrami McGraw Hill 7. Object Oriented Modeling and Design withUML J. Rambaugh, PHI M. Blaha 8. Oriented Software Engineering Ivar Jacobson AWL 9. Applying UML & Patterns: An Introduction to Larman Pearson Education Object Oriented Analysis and Design, 10. Object Oriented Software Engineering using UML Bernd Bruegge, Pearson Education Patterns and Java.Allen H.Dutoit 11. Object Oriented Modeling and Design J. Rambaugh, PHI M. Blaha et al,William Premerlani, FredrickEddy, William Lorensen,
Teaching Methodology	Discussion, Independent Study, Seminars and 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 end semester written examination

Course: 204: Data Warehousing & Data Mining

Course Code	204
Course Title	Data Warehousing & Data Mining
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2014
Purpose of Course	The purpose of the course is to make student capable of understanding and implementing concepts and techniques related to data warehousing and data mining.
Course Objective	To provide a comprehensive knowledge of Data Warehousing and different Data Mining Techniques
Pr-requisite	Basic Concept of RDBMS, Information System, OLTP
Course Out come	After completion of this course, the student will be capable to carry out data warehousing related activities, data preprocessing, data mining and analysis
Course Content	<p>Unit -1 Introduction to Data warehousing</p> <ol style="list-style-type: none"> 1.1 Data Warehouse characteristics 1.2 Data Marts 1.3 Applications of Data Warehousing 1.4 OLTP and OLAP systems 1.5 Star schema, Multifact star schema or snow flake schema, Fact Constellation schema 1.6 OLAP Operations in the Multidimensional data model 1.7 OLAP servers & Tools 1.8 Building a Data Warehouse 1.9 Architectural strategies & Design issues 1.10 Metadata Repository <p>Unit -2 Introduction to Data Mining</p> <ol style="list-style-type: none"> 2.1 Importance of and Motivation behind data mining 2.2 Data mining process and knowledge discovery 2.3 Introduction to Data Mining techniques 2.4 Data Pre-processing-Cleaning, Integration and Transformation, Reduction, Discretization etc. 2.5 Major issues in Data Mining <p>Unit -3 Association Rule Mining</p> <ol style="list-style-type: none"> 3.1 Basic concepts and Roadmap for association rule mining and its Applications 3.2 Apriori Algorithm, its limitations and improvements 3.3 Comparative study of Apriori its improvements and FPGrowth Association Rule Mining Algorithms <p>Unit -4 Classification and Prediction</p> <ol style="list-style-type: none"> 4.1 Introduction and Applications of classification 4.2 Data Preparation for classification and prediction 4.3 Decision tree Model based classifier 4.4 Decision tree Induction-based classifier, Advantages and Limitations, Hunts Algorithm, 4.5 Tree pruning 4.6 Measures for Attribute selection -Info.Gain, GINI Index, Entropy,

	<p>Classification error</p> <p>4.7 Rule based classification, its coverage and accuracy, Advantages and limitations</p> <p>4.8 Overview of various classification algorithms(J48, ID3, C4.5)</p> <p>Unit 5 Clustering& Other Data Mining Techniques</p> <p>5.1. Introduction and Applications of clustering</p> <p>5.2. Types of Data Variables in clustering-Interval scaled, Binary, Nominal, Ordinal, RatioScaled</p> <p>5.3. Categorization of Major clustering Methods</p> <p>5.4. Partitioning Methods - <i>k</i>-Means algorithm and <i>k</i>-Medoids</p> <p>5.5. Introduction other clustering methods- Hierarchical Clustering, Agglomerative Clustering, Density based Clustering Methods, Grid-Based Clustering, Model Based Clustering</p> <p>5.6. Other Data Mining Techniques</p> <p>5.6.1 Data Prediction-Linear regression based prediction</p> <p>5.6.2 Outlier Analysis- Statistical based, Distance based, Deviation based</p> <p>5.6.3 Conceptual Techniques- Data characterization and Generalization, Data Comparison or Discrimination</p>
Reference Book	<ol style="list-style-type: none"> 1. Data Warehouse Toolkit R. Kinball JohnWiley & Sons 2. Decision Support and Data Warehouse Systems Efrim G. Mallach TMH 3. Data Warehousing Fundamentals PaulrajPulliah Wiley 4. Data Warehousing in the real world S. Anahory& D. Murray Addison Wesley 5. The Data Warehouse Lifecycle Toolkit R. Kinball, L.Reeves Mosley JohnWiley &Sons 6. Principles of Data Mining David Hand, HeikkiMannila,Padhraic SmythPHI 7. Data Warehousing C.S.R.PrabhuPHI 8. Data Mining Next Generation Challenges & Future Directions HillolKargupta, AnupamJoshi, Yelena Yesha, KrishnamoorthySivakumarPHI 9. Data Mining Concepts & Techniques Jiawei Han, MichelineKamber 10. Data Mining Introductory and Advanced Topics Dunham Pearson 11. Data Mining Techniques and Trends N.P Gopalan, B. Sivasalvan PHI
Teaching Methodology	Discussion, Independent Study, Seminars and 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 end semester written examination

Course: 205 Subject: Information Security

Course Code	205
Course Title	Information Security
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2014
Purpose of Course	The purpose of the course is to make student capable of understanding and implementing concepts and techniques related to information security.
Course Objective	To provide a comprehensive knowledge of security issues and cryptography
Pr-requisite	Programming in Java or C#.
Course Out come	After completion of this course, the student will be capable to understand security issues and their solutions
Course Content	<ol style="list-style-type: none"> 1. Security Basics <ol style="list-style-type: none"> 1.1 Computer Security , Information Security , Threat and Attacks and Malicious Logic 1.2 Countermeasures 1.3 Security Policies , Confidentiality Polices and Integrity Policies 1.4 Operating System Security <ol style="list-style-type: none"> 1.4.1 Security Risks at Common Ports and Services , File Systems and Resources & user accounts 1.4.2 Operating System Hardening 2. Network and other securities <ol style="list-style-type: none"> 2.1 Common network security Incidents and Attacks 2.2 Threat and attack at Boundary Devices and their defences 2.3 Firewall Implementation as a defence mechanism 2.4 VPN Implementation as a defence mechanism 2.5 Intrusion Detection and Prevention Implementation as a defence mechanism 2.6 Web related threats, attacks and defence mechanism 2.7 Database related threats, attacks and defence mechanism 2.8 wireless network related threats, attacks and defence mechanism 2.9 Security in e-commerce, m-commerce-issues and solutions 3. Symmetric Ciphers <ol style="list-style-type: none"> 3.1 Encryption techniques (Caesar cipher, zebra technique, vinegar cipher, transposition cipher, play fair cipher, rail fence cipher, hill cipher) 3.2 Block Cipher 3.3 DES, Triple DES, AES 3.4 Contemporary Symmetric Cipher 4 Asymmetric encryption <ol style="list-style-type: none"> 4.1 Use of Number Theory 4.2 Public-key Cryptography 4.3 RSA 4.4 Authentication Protocols <ol style="list-style-type: none"> 4.4.1 Message authentication and hash function

	<p>4.4.2 Hash algorithms - MD5 , SHA1</p> <p>4.4.3 Digital signatures</p> <p>4.4.4 SSL</p> <p>5. Secure Application level Protocols</p> <p>5.1 SMIME</p> <p>5.2 SFTP</p> <p>5.3 PGP</p> <p>5.4 Steganography</p> <p>5.5 HTTPS (SSL)</p>
Reference Book	<ol style="list-style-type: none"> 1. Computer Security: Art and Science Matt Bishop Addison-Wesley 2. Introduction to Computer Security Matt Bishop Addison-Wesley 3. Information security William Stallings 4. Cryptography and Public Key Infrastructure on the Internet Klaus Schmeih Willey 5. Beginning Cryptography with Java David Hook Wrox 6. Information Security-Theory and Practices Dhiren Patel PHI 7. Cryptography and Network Security, Fourth William Stallings Edition
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	<p>30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc.</p> <p>70% assessment is based on end semester written examination</p>

Course: 206 Project in C#

Course Code	206
Course Title	Project in C#
Credit	6
Teaching per Week	6 hours
Minimum weeks per Semester	15 (Project work, Self-Study, examination, preparation, holidays etc.)
Last Review / Revision	--
Purpose of Course	The purpose of the course is to make students capable of developing professional applications using latest tools and technologies of C#.Net.
Course Objective	To expose students to industrial practices and activities of software engineering and train them about the same using C#.Net.
Pr-requisite	Knowledge of Advanced Programming, Latest Technologies and Tools and Software Engineering
Course Out come	After completion of this course, the student will be capable of developing professional applications using latest tools and technologies of C#.Net.
Course Content	<p>The project will be in-house mini project that students are supposed to develop in laboratory session allocated for the same. The students must prepare documentation of the project work done as per the software Engineering Guidelines. At the end of the semester, the students have to submit their project report in bounded form to the respective institution. The project presentation and viva – voice will be conducted on the basis of it.</p> <p>The students have to submit the following reports to their respective institution:</p> <ol style="list-style-type: none"> 1. Appropriate name of the project 2. Monthly Progress Report duly sign by the concern internal guide 3. Project Completion Certificate from Institute <p>Without such reports student will not be allowed to appear in his/her final Project Presentation and Viva-Voice</p>
Reference Book	As per Paper:202
Teaching Methodology	LabWork
Evaluation Method	<p>30% Internal assessment is based on project presentation and/or demonstration and viva-voice examination.</p> <p>70% assessment is based Project Presentation and/or demonstration and viva-voice examination at the end of semester.</p>

Course: 207 Practical on Data Mining

Course Code	207
Course Title	Practical on Data Mining
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2014
Purpose of Course	The purpose of the course is to make students capable of implementing concepts, methods, tools and techniques of data mining learnt in course 204 Data warehousing and Data Mining
Course Objective	The Objective of this course is to enable students to apply various data mining techniques and analyze the result.
Pr-requisite	Basic understanding of Programming and Algorithms
Course Out come	After completion of this course, the student will be capable of performing various types of data mining on different datasets.
Course Content	<p>The students will be required to carry out practical on data mining on the topics covered in Paper 204: "Data warehousing and Data Mining" using the methods and tools discussed there in.</p> <p>A Journal must be prepared for the practical work done.</p>
Reference Book	As per Paper:204
Teaching Methodology	
Evaluation Method	<p>30% Internal assessment is based on Practical attendance, Problem Solving, internal examination etc.</p> <p>70% assessment is based practical examination at the end of semester.</p>

Course: 208 Practical on Information Security

Course Code	208
Course Title	Practical on Information Security
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2014
Purpose of Course	The purpose of the course is to make students capable of implementing concepts, methods, tools and techniques of cryptography learnt in course 205 Information Security
Course Objective	The Objective of this course is to enable students to apply various cryptographic algorithms.
Pr-requisite	Basic understanding of Programming and Algorithms
Course Out come	After completion of this course, the student will be capable of performing various types of cryptography.
Course Content	<p>The students will be required to carry out practical on cryptography on the topics covered in Paper 205: “Information Security” using the methods and tools discussed there in.</p> <p>A Journal must be prepared for the practical work done.</p>
Reference Book	As per Paper:205
Teaching Methodology	
Evaluation Method	<p>30% Internal assessment is based on Practical attendance, Problem Solving, internal examination etc.</p> <p>70% assessment is based practical examination at the end of semester.</p>

