



# VELS

INSTITUTE OF SCIENCE, TECHNOLOGY  
& ADVANCED STUDIES (VISTAS)



(DEEMED TO BE UNIVERSITY Estd. u/s 3 OF THE UGC ACT, 1956)

**NAAC ACCREDITED**

PALLAVARAM - CHENNAI - INDIA

## School of Computing Sciences Department of Computer Science

### M.Sc Computer Science

#### Program Outcome (PO)

- PO-1:** To attain deep knowledge and understanding the principles of programming for applying in broad range of languages and open source platforms.
- PO-2:** To improve the ability of imparting knowledge in various domains and to solve real world problems with modern technological tools.

#### Program Specific Outcome (PSO)

- PSO-1:** Understand analyze and develop computer programs in the areas related to algorithms, system software, compiler design, web design, mobile computing and networking for efficient design of computer based system of varying complexity.
- PSO-2:** The ability to interpret the fundamental concepts and methodology of computer systems. Students can understand the functionality of hardware and software aspects of computer system.
- PSO-3:** Apply standard software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality for business success.
- PSO-4:** Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.
- PSO-5:** An ability to produce cost effective, quality and maintainable software products and solutions (services) meeting the global standards and requirements with the knowledge acquired and using the emerging techniques, tools and software engineering methodologies and principles and able to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

# School of Computing Sciences

## M.Sc Computer Science

### Board of Studies Members

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7.	<b>Dr.P.Magesh Kumar</b> , Calibsoft Technologies Pvt Ltd., Chennai.	<b>Industry Member</b>
8.	<b>Dr.JothiVenkateswaran</b> , HOD, Department of Computer Science, Presidency College, Chennai.	<b>Special Invitees</b>
9.	<b>Mr.R.Balamurugan</b> , SCOPUS Ltd, Chennai.	<b>Alumni Member</b>

**M.Sc**  
**Computer Science**

Curriculum and Syllabus  
(Based on Choice Based Credit System)  
Effective from the Academic year  
2015-2016

# M.Sc COMPUTER SCIENCE

## CURRICULUM

Total number of Credits: 90

Category	Code No.	Course	Hours/Week			Credits
			Lecture	Tutorial	Practical	
<b>SEMESTER I</b>						
Core	15MCS001	Linux Programming	4	0	0	4
Core	15MCS002	Design and Analysis of Algorithm	5	0	0	4
Core	15MCS003	Compiler Design	5	0	0	4
Core	15MCS004	Linux Programming Lab	0	0	3	2
Core	15MCS005	Data Structure using Java Lab	0	0	3	2
DSE	15-----	Discipline Specific Elective-I	5	0	0	4
GE	15-----	Generic Elective-I	5	0	0	4
TOTAL			24	0	6	24

Category	Code No.	Course	Hours/Week			Credits
			Lecture	Tutorial	Practical	
<b>SEMESTER II</b>						
Core	15MCS006	Open Source Technology	4	0	0	4
Core	15MCS007	Advanced Java	5	0	0	4
Core	15MCS008	Open Source Technology Lab	0	0	3	2
Core	15MCS009	Advanced Java Lab	0	0	3	2
DSE	15-----	Discipline Specific Elective-II	5	0	0	4
DSE	15-----	Discipline Specific Elective-III	5	0	0	4
GE	15-----	Generic Elective-II	5	0	0	4
TOTAL			24	0	6	24

Category	Code No.	Course	Hours/Week			Credits
			Lecture	Tutorial	Practical	
<b>SEMESTER III</b>						
Core	15MCS010	Dot net Programming	4	0	0	4
Core	15MCS011	Network Security	5	0	0	4
Core	15MCS012	Dot net Programming Lab	0	0	3	2
Core	15MCS013	Mini project	0	0	3	2
DSE	15-----	Discipline Specific Elective-IV	5	0	0	4
DSE	15-----	Discipline Specific Elective-V	5	0	0	4
GE	15-----	Generic Elective-III	5	0	0	4
TOTAL			24	0	6	24

Category	Code No.	Course	Hours/Week			Credits
			Lecture	Tutorial	Practical	
<b>SEMESTER IV</b>						
Core	15MCS014	Project & Viva Voce	0	0	0	18
TOTAL			0	0	0	18

## LIST OF DISCIPLINE SPECIFIC ELECTIVES

15MCS101	Cloud Computing
15MCS102	Big data analytics
15MCS103	Web services using XML
15MCS104	Data mining and Warehousing
15MCS105	Grid Computing
15MCS106	Client Server Computing
15MCS107	Soft Computing
15MCS108	Fuzzy Logic
15MCS109	Artificial Neural Networks
15MCS110	Artificial intelligence
15MCS111	Object oriented analysis and design
15MCS112	Digital Image Processing
15MCS113	Software Testing
15MCS114	Software Quality Assurance
15MCS115	Software Engineering
15MCS116	Mobile Computing

## LIST OF GENERIC ELECTIVES

15MCS151	Web designing
15MCS152	Client side Scripting Languages
15MCS153	Photoshop
15MCS154	Flash
15MCS155	Advaced Excel
15MCS156	Statistical Package For Social Science
15MCS157	Programming in Tally
15MCS158	Office Automation Tools
15MCS159	System Administration and Maintanance
15MCS160	Desktop publishing
15MCS161	MySQL
15MCS162	Cyber law

4.

# **Syllabus**

## **Core Courses**

**Course Objective:** This course introduces the basic concepts of Linux administration and operating system, provide information to data and driver management, and explain execution procedure, debugging and kernel structure.

**Course Outcomes:**

**CO-1:** To Understand the basic set of commands and utilities in Linux/UNIX systems.

Work confidently in Unix/Linux environment.

**CO-2:** To learn the basics of linux administration. To learn to develop software for Linux/UNIX systems.

**CO-3:** Write shell scripts to automate various tasks. To run basic commands and utilities (cd, mkdir, rm, cp, cat, etc.); piping, redirection, filters (grep, sed etc.); command line editing, history, etc; shell startup files, aliases.

**CO-4:** To understand about System programming: files and I/O (open, close, read, write, dup, etc.); directories (opendir, readdir, etc.); processes (fork, exec, etc.); signals.

**CO-5:** To implement the Network Protocols: IP basics; TCP, UDP client-server model; Sockets system calls, Inter Process communications.

**CO-6:** To be able to design and build an application/service over the Linux operating System.

**CO-7:** To implement GUI programming in Linux using Curses and curses Library. To implement event oriented programming using WINDOW, COLOR etc.

**CO-8:** To build and run kernel modules, To compile the module and put entry in the Kernel symbol table,

**CO-9:** To develop device driver and Block driver programs in Linux. Register char Devices and Block driver using Major and Minor numbers.

**CO-10:** To develop the debugger and implement interrupt handler to handle system faults and the bugs.

**UNIT I INTRODUCTION**

**12**

Introduction to Linux, Shell Programming - shell, Pipes and redirection, working with Files – Linux File structure, standard I/O library, Formatted Input and Output, File and Directory maintenance, Managing Text-Based screens with curses-The Screens, Keyboard, windows, sub windows, using color.



## **UNIT II DATA AND DRIVER MANAGEMENT**

**14**

Data Management- managing memory, File locking, Processing and signals- Process, new Process, signals, Thread, Inter process Communication- pipe, pipe call, socket, socket connections. Introduction to device Drivers – role of device driver, splitting the kernel, classes of devices and modules, security issues.

## **UNIT III EXECUTION PROCEDURE**

**14**

Building and running modules-the Hello world module- kernel modules Vs applications, compiling and loading, kernel symbol table, initialization and shutdown. Char drivers – design of scull, Major and minor numbers, some important data structures, char device registration, open and release.

## **UNIT IV DEBUGGING**

**16**

Debugging Techniques- Debugging by printing, Debugging by Querying, and Debugging by watching, Debugging system faults. Interrupt handling- preparing parallel port, installing an interrupt handler, implementing a handler, interrupt sharing, Interrupt driven I/O.

## **UNIT V LINUX KERNAL**

**16**

Block drivers- Registration, the block device operations, Request processing, Introduction to the Linux kernel, Obtaining the kernel service, building the kernel, System calls, System call Handler-System call implementation.

**TOTAL: 72 Hours**

### **Text Books:**

- 1.Beginning Linux Programming,Neil Matthew, Richard stones, Alan Cox, Wrox Publication,2004.
2. Linux Device Drivers, Alessandro Rubini, Jonathan Corbet, Third Edition, 2003.
3. Linux Kernel Development, Robert Love, 2nd Edition, 2001.

### **References Books :**

1. Writing Device drivers, Tutorial and reference, Tim Burke, Mark A. Parenti, and AI Wojtas, Butterworth-Heinemann, July, 1995.
2. Writing Unix device drivers, George pajari, Addison Wesley Professional, November, 1991.
3. Understanding the Linux Virtual Memory Manager, Mel Gorman, Prentice Hall, 2004.

**Course Objective:** This course gives insight into the design and analysis For drive and conquer, sorting, dynamic programming, backtracking, lower bound, knapsack, tree vertex splitting, biconnected problems.

**Course Outcomes:**

- CO-1:** Ability to Understand, Analyze the performance of recursive and non recursive algorithms and use of asymptotic notations to measure the performance of algorithms.
- CO-2:** To prove the correctness and analyze the running time of the basic algorithms for those classic problems in various domains.
- CO-3:** Able to develop any new application with the help of data structures and algorithms.
- CO-4:** Ability to design the algorithm using greedy method
- CO-5:** Ability to develop applications using the concept of Dynamic programming
- CO-6:** Ability to develop gaming applications using backtracking.
- CO-7:** Apply branch and bound to Travelling sales person problem, 0/1 knapsack problem.
- CO-8:** To design algorithms using the Branch and Bound strategy, and recite algorithms that employs this strategy
- CO-9:** To compare, contrast, and choose appropriate algorithmic design techniques to present an algorithm that NP, NP-complete, and NP-hard.
- CO-10:** To synthesize efficient algorithms in common engineering design situations.

**UNIT I INTRODUCTION**

**15**

Introduction - Definition of Algorithm – pseudocode conventions – recursive algorithms – time and space complexity –big-“oh” notation – practical complexities – randomized algorithms – repeated element – primality testing - Divide and Conquer: General Method - Finding maximum and minimum – merge sort.

**UNIT II DIVIDE AND CONQUER METHOD**

**15**

Divide and conquer contd. – Quicksort, Selection, Strassen's matrix multiplication – Greedy Method: General Method –knapsack problem - Tree vertex splitting - Job sequencing with dead lines – optimal storage on tapes.

**UNIT III DYNAMIC PROGRAMMING 15**

Dynamic Programming: General Method - multistage graphs – all pairs shortest paths – single source shortest paths - String Editing – 0/1 knapsack. Search techniques for graphs – DFS-BFS-connected components – biconnected components.

**UNIT IV BACKTRACKING ALGORITHM 15**

Back Tracking: General Method – 8-queens - Sum of subsets - Graph Coloring – Hamiltonian cycles. Branch and Bound: General Method - Traveling Salesperson problem.

**UNIT V LOWER BOUND ALGORITHM 15**

Lower Bound Theory: Comparison trees - Oracles and advisory arguments - Lower bounds through reduction - Basic Concepts of NP-Hard and NP-Complete problems.

**TOTAL: 75 Hours**

**Text Book:**

1. E. Horowitz, S. Sahni and S. Rajasekaran, Computer Algorithms, Galgotia, New Delhi, 1999.

**Reference Books:**

1. Fundamentals of Algorithms, G. Brassard and P. Bratley, PHI, New Delhi, 1997.
2. The design and analysis of Computer Algorithms, A.V. Aho, J.E. Hopcroft, J.D. Ullmann, Addison Wesley, 1974.
3. Introduction to the Design and Analysis of algorithms, S.E.Goodman and S.T.Hedetniemi, Tata McGraw Hill, 1977.

**Course Objective:** This course gives an insight into introduction, parsing techniques, of compiler, working with syntax, grammar and semantics of programming languages proving students with an analogy to help them understand how grammar works for programming languages.

**Course Outcomes:**

**CO-1:** Be familiar with introduction to compiler and phases of compiler.

**CO-2:** Be exposed to the concepts of actual role of lexical analyser.

**CO-3:** Master the key concepts of context-free grammar.

**CO-4:** Understand and apply different parsing techniques and construction of syntax tree.

**CO-5:** Master the advanced features of automatic parsing techniques specifically LR parser, SLR parser.

**CO-6:** Be exposed to the concepts of construction of LR, SLR parsing table.

**CO-7:** Be familiar with syntax directed translation concepts.

**CO-8:** Be exposed to the concepts of intermediate code generation.

**CO-9:** Be exposed to code generation algorithm.

**CO-10:** Be familiar how to apply code generating algorithm to construct code generator.

**UNIT I INTRODUCTION**

**15**

Introduction – Structure of a Compiler – Compiler writing tools – Basic constructs of High level programming languages – Data structures – Parameter transmission. Lexical Analysis – Role of Lexical analyzer – Finite Automata – Regular Expressions to Finite Automata – Minimizing number of states of Deterministic Finite Automaton –Implementation of Lexical analyzer in C.

**UNIT II PARSING TECHNIQUES**

**15**

Parsing Techniques – Context free Grammars – Derivations and Parse trees –Ambiguity – Capabilities of Context free grammar - Top down and Bottom up Parsing – Handles – Shift Reduce parsing – Operator precedence parsing – Recursive Descent parsing – Predictive Parsing.

**UNIT III AUTOMATIC PARSING TECHNIQUES** **15**

Automatic Parsing Techniques – LR parser – Canonical Collection of LR(0) items – Construction of SLR parsing tables – LR(1) sets of items construction – Construction of canonical LR parsing tables.

**UNIT IV INTERMEDIATE CODE** **15**

Syntax Directed Translation – Semantic action – Implementation of syntax directed translators – Intermediate code: Prefix notation, Quadruples, Triples, Indirect triples –Methods of translation of assignment statements, Boolean expressions and Control statements.

**UNIT V LOWER BOUND ALGORITHM** **15**

Symbol Tables and Code Generation: Representing information in a symbol table –Data structures for symbol table – Introduction to code optimization – Basic blocks –DAG representation – Error detection and Recovery – Introduction to Code generation.

**TOTAL: 75 Hours**

**Text Books:**

1. Compilers-Principles,Techniques,andTools, V.Aho,Ravi Sheethi.,Pearson Education, 3<sup>rd</sup> Edition, 2007.
2. Modern Compiler Design, David Galles, Pearson Education Asia, 20072.

**Reference Books:**

1. Advanced Compiler Design & Implementation, StevenS.Muchnick, Morgan Kaufmann Pulishers, 2000.
2. Crafting a Compiler with C, C. N. Fisher and R. J. LeBlanc Pearson Education, 2000.

**Course Objective:** This course gives practical training in Linux programming to perform the various commands in shell script. It gives hands on training in File operations in C Programming.

1. Write a shell script to perform the file operations using Linux commands.
2. Write a shell script to perform the operations of basic Linux utilities.
3. Write a shell script to perform nCr calculation using recursion.
4. Write a shell script to sort numbers and alphabetic from a text file using single 'awk' command.
5. Write a Shell script to display all the files which are accessed in the last 10 days
6. Write a Shell script to list all the files in a directory having size less than 3 blocks, greater than 3 blocks and equal to 3 blocks.
7. Write a Shell script to display the numbers between 1 and 9999 in words.
8. Write a Shell script for Palindrome Checking.
9. Write a shell script to find the number of characters, words and lines for a given file without using 'wc' command.
10. Write a C program for the following commands: a) cp b) mv c) merging
11. Write a C program to convert starting lowercase letter of each word into uppercase in a file
12. Write a C program to print the contents of the file in reverse order

**TOTAL: 45 Hours**

**Course Objective:** This course trains the students programming skills in problem solving and algorithms.

1. Write Java program to implement the Stack ADT using an array.
2. Write Java program to implement the Queue ADT using an array
3. Write a Java program that to create a binary search tree using recursive functions.
4. Write a Java program that to copy the above binary search tree using recursive functions.
5. Write Java programs for the implementation of BFS for a given graph.
6. Write Java programs for the implementation of DFS for a given graph.
7. Write Java programs for implement Quick sort methods.
8. Write Java programs for implement Merge sort methods.
9. Write Java programs for implement Binary tree sort methods.
10. Write a JAVA program to insert and delete an element from an AVL- tree.
11. Write a JAVA program for generating Minimum cost spanning tree using Kruskal's algorithm.
12. Write Java programs for implement Selection sort methods.

**TOTAL: 45 Hours**

**Course Objective:** This course introduces students to the technological, social and pragmatic aspects of developing and working with the various open source tools MySQL, PHP, PYTHON and PERL.

**Course Outcome :**

**CO-1 :** To understand and recognize the benefits and features of Open Source Technology.

**CO-2 :** To Interpret, Contrast and compare open source products among themselves and to understand and demonstrate Version Control System along with its commands.

**CO-3 :** Ability to install and run open-source database MySQL and develop applications.

**CO-4 :** To develop critical thinking skills through producing conceptual data models and solving relational algebra and SQL query problems.

**CO-5 :** Ability to gather information about Free and Open Source Software projects using PHP from software releases and from sites on the internet.

**CO-6 :** To understand and connect the database (MYSQL) with PHP to achieve and modify one or more Free and Open Source Software packages.

**CO-7 :** To understand python scripting and contributions which helps to problem solving and programming capability.

**CO-8 :** To implement methods and functions to improve readability of programs.

**CO-9 :** To demonstrate the proper use of Perl syntax, including control structures and expressions , built-in Perl functions.

**CO-10 :** Ability to contribute software to and interact with Free and Open Source Software development projects.

**UNIT I INTRODUCTION**

**12**

Introduction to open sources – Need of open sources – advantages of open sources – application of open sources. Open source operating systems: LINUX : Introduction – general overview –Kernel mode and user mode –process – advanced concepts –scheduling – personalities – cloning – signals – development with Linux.

**UNIT II MySQL**

**16**

Introduction – setting up account – starting, terminating and writing your own SQL programs-record selection Technology – working with strings – Date and Time – sorting Query results – generating summary –working with meta data –using sequences – MySQL and Web.



**UNIT III PHP****16**

Introduction –programming in web environment –variables- constants – data types–operators – statements – functions – arrays – OOP – string manipulations and regular expression – file handling and data storage – PHP and SQL database – PHP and LDAP – PHP connectivity – sending and receiving E-mails – debugging and error handling – security –templates.

**UNIT IV PYTHON****14**

Syntax and style – python objects – numbers – sequences – strings – lists and tuples – dictionaries – conditional loops –files – input and output – errors and exceptions – functions – modules – classes and OOP – execution environment.

**UNIT V PERL****14**

Perl backgrounder – perl overview – perl parsing rules – variables and data – statements and control structures – subroutines -, packages and modules – working with files – data manipulation.

**TOTAL: 72 Hours****Text Books:**

1. The Linux Kernel book, Remy Card, Eric and Frank Mevel, Wiley Publications 2003.
2. Programming PHP,Rasmus Lerdorf and Levin Tatroe, O'Reilly, 2002
3. Core Python Programming, Wesley J. Chun, Prentice Hall, 2001

**Reference Books:**

1. Perl : The Complete Reference, Martin c. Brown Tata McGraw- Hill, 2<sup>nd</sup> Edition, 2009
2. MySQL : The Complete Reference, Vikram Vaswani, Tata McGraw-Hill,2<sup>nd</sup> Edition, 2009
3. PHP : The Complete Reference, Steve Holzner, Tata McGrawHill, 2<sup>nd</sup> Edition,2009.
4. MySQL Bible,Steve Suchring ,John Wiley, 2<sup>nd</sup> Edition, 2002.

**Course Objective:** This course introduces the concepts of Advanced java Programming such as Servlet, Java beans, Enterprise Java Beans, Remote Method Invocation and Java Server Pages concepts.

**Course Outcomes:**

- CO-1 :** To understand some advanced programming concepts to deal with complex data objects as whole entities, rather than by twiddling with their elements.
- CO-2 :** This module exposes students to make depth and breadth of modern programming practice with the goal of better programmers.
- CO-3 :** Aims to introduce the students to involve the concepts of advanced programming and practice on reusing components. It focuses on Graphical User Interface (GUI), multithreading, networking and database manipulation.
- CO-4:** It focuses on Graphical Users with multithreading, networking and database manipulation to complete the module to write sophisticated Java applications.
- CO-5 :** Develop Swing-based GUI is used to develop client/server applications and TCP/IP socket programming for Update and retrieve the data from the databases using SQL. in Real world applications.
- CO-6 :** To implement the distributed applications using RMI with component-based Java software using JavaBeans for developing server side programs in the form of servlets.
- CO-7 :** Develop server side programs to Understand difference between Swing and AWT programming and to define Swing components with list of Swing Packages.
- CO-8 :** To design and implement the Two-Tier Client Server Model to Use JDBC and to access a database connection for Creating executing of the Result Set object and the Result Set Meta Data interface .
- CO-9 :** To analyze a problem and determine what problem elements to represent as functions of EJB objects for Communication skills (personal and academic)..
- CO-10 :** To develop Effective parameterization and inheritance to promote reuse programs with Java bean networking and multithreading and to Compose more complex programs that implement Assessment Instruments Allocation.

**UNIT I SERVLET****15**

Servlet overview – the Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication.

**UNIT II JAVA BEANS****15**

Java Beans: The software component assembly model- The java beans development kit-developing beans – notable beans – using infobus - Glasgow developments - Application Builder tool- JAR files-Introspection-Bound Properties-Persistence-customizers - java beans API.

**UNIT III EJB****15**

EJB architecture- EJB requirements – design and implementation– EJB session beans- EJB entity beans-EJB Clients – deployment tips, tricks and traps for building distributed and other systems – implementation and future directions of EJB-Variable in perl- perl control structures and operators – functions and scope

**UNIT IV RMI****15**

Overview – Developing applications with RMI: Declaring & Implementing remote interfaces-stubs & skeletons,Registering remote objects,writing RMI clients –Pushing data from RMI Servlet – RMI over Inter-ORB Protocol.

**UNIT V JSP****15**

Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages - using Java Beans in JSP Working with Java Mail-Understanding Protocols in Javamail-Components-Javamail API-Integrating into J2EE-Understanding Java Messaging Services-Transactions.

**TOTAL: 75 Hours****Text Books:**

1. J2EE 1.4 Bible, J. McGovern,R. Adatia,Y. Fain,Wiley-dreamtech Publication,2003.
2. Java 2 Complete Reference, H. Schildt, TMH,5<sup>th</sup> Edition, 2002.

## Reference Books:

1. Java Servlets, K. Moss, Tata McGraw Hill, Second edition, 1999.
2. Inside Servlets, D. R.Callaway,Addison Wesley, 2<sup>nd</sup> Edition, 1999.
3. Java Beans from the Ground Up, Joseph O'Neil, Tata McGraw Hill, 2<sup>nd</sup> Edition, 1998.
4. Enterprise JavaBeans, TomValesky,Addison Wesley, 2<sup>nd</sup> Edition, 2001.
5. Core Java Vol II Advanced Features, Cay S Horstmann &Gary Cornell,AddisonWesley, 3<sup>rd</sup> Edition, 2002.

**15MCS008**

**OPEN SOURCE TECHNOLOGY LAB**

**0 0 3 2**

**Course Objective:** This course gives practical training to the students for the technological, social and pragmatic aspects of developing and working with the various open source tools MySQL, PHP.

1. Develop a PHP program using controls and functions
2. Develop a PHP program and check message passing mechanism between pages.
3. Develop a PHP program using String function and Arrays.
4. Develop a PHP program to display student information using MYSQL table.
5. Develop a PHP program to design a college application form using MYSQL table.
6. Develop a PHP program to design a Telephone Bill Application form using MYSQL table
7. Develop a PHP program to design a Library Management System form using MYSQL table
8. Develop a PHP program using parsing functions (use Tokenizing)
9. Develop a PHP program and check Regular Expression, HTML functions, Hashing functions.
10. Develop a PHP program and check File System functions, Network functions, Date and time functions.
11. Develop a PHP program using session
12. Develop a PHP program using cookie and session

**TOTAL: 45 Hours**

**Course Objective:** This course gives practical training in Advanced Java programming concepts like Servlet, JSP, Java Beans to develop the students' programming talent to the Industrial need.

1. HTML to Servlet Communications
2. Servlet to HTML Communication
3. Applet to Servlet Communication
4. Servlet to Applet Communication
5. Designing online applications with JSP
6. Creating JSP program using JavaBeans
7. Working with Enterprise JavaBeans
8. Performing Java Database Connectivity.
9. Creating Web services with RMI.
10. Creating and Sending Email with Java
11. Building web applications
12. Finding Simple Interest using Session Management.

**TOTAL: 45 Hours**

**Course Objective:** This course introduces the fundamental concepts of VB.NET, ASP.NET, ADO.NET for web development to produce dynamic Web pages and to built web sites , web applications and web services.

**Course Outcomes:**

**CO-1:** To Understand And Learn To Maintain Internet Application Server And dot Net Services.

**CO-2:** To Program And Debug Applications Using A Variety Of Client Side And Server Side Technologies.

**CO-3:** To Exhibit The Knowledge Of Programming with Basic Building Blocks Of VB.Net Environment.

**CO-4:** To Develop Applications By Using OOPs Concepts Such As Polymorphism, Inheritance in Vb.Net.

- CO-5:** To Gain Deep Knowledge in Different Controls Using Web Server, Data List for Developing Applications in ASP.Net Environment.
- CO-6:** To Apply Validation Controls in Developing Online Client Page Design for Reservation, Banking.
- CO-7:** To Apply The Features Of All Objects, Caching And Session Management For Every Client.
- CO-8:** To Authenticate Web Pages And To Know How To Develop Event Related with Error Free Applications.
- CO-9:** To Compare the functionalities of Connected and Disconnected Architectures and also the Reader and Adapter Classes of ADO.Net.
- CO-10:** To develop applications which connect ASP.Net Client pages with Database Servers using ADO.Net Classes.

**UNIT I INTRODUCTION TO .NET TECHNOLOGIES 12**

Introduction Internet and Web Technologies-HTML Basics - Scripts- Client-side Vs Server-side Scripts – Advantages and Disadvantages of Client-side and Server-side Scripts - Client-side Technologies Overview - Server-side Technologies Overview History of the Platform of .NET - .NET Framework Components Overview with Focus on CLR, CTS.

**UNIT II VB.NET BUILDING BLOCKS 16**

Introduction VB.NET – VB Vs VB.NET – VB.NET Integrated Development Environment – Basic Keywords – Data Types – VB.NET statements – Conditionals - If Else – Select Case – Switch and Choose – Loops – Do –For Next – For Each Next – While –Windows Forms – Working with Controls – MDI –VB.NET Functions – OOPs in VB.NET.

**UNIT III INTRODUCTION TO ASP.NET AND ASP.NET CONTROLS 16**

Introduction to ASP.NET - Advantages of ASP.NET - ASP. NET Architecture - ASP.NET Page’s Structure -Sample Program in ASP.NET - Page Events - HTML Server Controls - Basic Web Server Controls - Data List Web Server Controls - Validation Controls - Web User Controls in ASP.NET.

**UNIT IV OBJECTS AND ADVANCED CONCEPTS IN ASP.NET 14**

Request Object - Response Object -Code-Behind Feature of ASP.NET - Caching in ASP.NET - Output Caching -Fragment Caching - Data Caching - Session / State

Management – Events and Abandon Method – Authentication in ASP.NET - Error Handling and Debugging - Tracing an Application.

## **UNIT V ADO.NET FOR .NET APPLICATIONS**

**14**

Introduction to ADO.NET – ADO Vs ADO.NET – Connected ADO.NET Architecture – Disconnected ADO.NET Architecture – Data Reader - Data Adapter – ADO.NET Classes – ADO.NET Namespaces – Interfacing VB.NET Applications with ADO.NET – Interfacing ASP.NET Applications with ADO.NET.

**TOTAL: 72 Hours**

### **Text Books:**

1. Professional .NET Framework 2.0 , Joe Duffy, Wrox Publications, 2006 Edition.
2. Visual Basic.NET Programming – Black Book, Steven Holzner, Paraglyph Press and Dream Tech Press, 2005 Edition.
3. Professional ASP.NET 1.1, Alex, Wrox Publications, 2<sup>nd</sup> Edition, 2004.
4. ADO.NET Complete Reference, Michael Otey and Denielle Otey, Tata Macraw Hill Publication, 4<sup>th</sup> Edition, 2007.

**15MCS011**

**NETWORK SECURITY**

**5 0 0 4**

**Course Objective:** This course introduces the fundamental concepts of Network security and Cryptography and working with .different encryption algorithm, message authentication and system security.

### **Course Outcome :**

- CO-1:** To Provide students with a high- level understanding of how information security functions in an organization both business and technology- centric.
- CO-2:** To describe master information security governance, and related legal and regulatory issues and to master understanding external and internal threats to an organization,
- CO-3:** To be familiarity with information security awareness and a clear understanding of its importance and to be familiar with how threats to an organization are discovered, analyzed, and dealt with.
- CO-4:** To understand master fundamentals of secret and public cryptography and to master protocols for security services

- CO-5:** To be well known with network security threats and countermeasures and to design available secure solutions (such as PGP, SSL, IPSec, etc),
- CO-6 :** To be familiar with advanced security issues and technologies (such as DDoS attack detection and containment, and anonymous communications).
- CO-7:** To be exposed to original research in network security. Evaluate cryptographic primitives and their implementations for correctness, efficiency, and security.
- CO-8:** To develop the importance of integrating people, processes and technology.
- CO-9:** To discuss how cryptography helps to achieve common security goals such as data secrecy, message integrity, non-repudiation and tasks.
- CO-10:** To describe and implement the specifics of some of the prominent techniques for public-key cryptosystems and digital signature schemes

**UNIT I INTRODUCTION 15**

Fundamentals: Attacks – Services – Mechanisms – Conventional Encryption – Classical and Modern Techniques –Encryption Algorithms –Confidentiality.

**UNIT II ENCRYPTION ALGORITHM 15**

Public Key Encryption: RSA – Elliptic Curve Cryptography – Number Theory Concepts.

**UNIT III MESSAGE AUTHENTICATION 15**

Hash Functions – Digest Functions – Digital Signatures – Authentication Protocols.

**UNIT IV NETWORK SECURITY PRACTICE 15**

Authentication– Applications – Electronic Mail Security – IP Security – Web Security.

**UNIT V SYSTEM SECURITY 15**

Intruders – Viruses – Worms – Firewalls Design Principles – Trusted Systems.

**TOTAL: 75 Hours**

**Text Book:**

1. Cryptography & Network Security, Principles & Practice, Stallings, Prentice Hall, 3rd Edition, 2002.



**Reference Books:**

1. Applied Cryptography, Bruce, Schneier, Toha Wiley & Sons, 2nd Edition,1996.
2. Internet Security, Man Young Rhee,Wiley Publication, 2<sup>nd</sup> Edition, 2003.
3. Security in Computing, Pfleeger & Pfleeger, Pearson Education, 3rd Edition,2002.

**15MCS012****DOT NET PROGRAMMING LAB****0 0 3 2**

**Course Objective:** This course gives practical training in Network programming using Visual Basic.Dot Net, Activex Data Object. Dot Net, Active Server Pages. Dot Net with various applications.

1. Programs to demonstrate various conditional statements in VB.NET
2. Programs to demonstrate various looping statements in VB.NET
3. Create a simple Application that demonstrates various windows controls available in VB.NET
4. Program that makes use of functions in VB.NET
5. Deploying OOP Concepts using VB.NET
6. Web Application in ASP.NET for Login Processing
7. Demonstration of validation controls in ASP.NET
8. Deployment of Calendar Control in ASP.NET
9. Traversing and selecting a Product Name displayed in dropdown list, through coding in the Form Load Event in ASP.NET
10. Creation of Web Application in ASP.NET for Conditions-based book issue in a Library
11. Deployment of Data Grid in ADO.NET for viewing product details.
12. Construction of Banking Application with Implementation of Web-user control for Dynamic Login Process

**TOTAL: 45 Hours**

# **SYLLABUS**

## **DISCIPLINE SPECIFIC ELECTIVES**

**Course Objective:** This course introduces the fundamental concepts of cloud computing model for enabling ubiquitous, convenient access to shared pool of configurable computing resources and storage solutions over a network.

**Course Outcomes:**

- CO-1:** Ability to understand architecture and concepts of different cloud models.
- CO-2:** Capable of creating applications by utilizing cloud platforms.
- CO-3:** Understanding the key dimensions of the challenges of cloud computing.
- CO-4:** Ability to assess own organization's needs for capacity building and training in cloud related IT areas.
- CO-5:** Attempt to generate new ideas and innovations in cloud computing.
- CO-6:** Ability to choose the appropriate technologies and approaches for the related issues to cloud computing.
- CO-7:** Understand how to provide the appropriate cloud computing solutions and recommendations according to the applications used.
- CO-8:** Explore cloud computing driven commercial systems such as Google Apps and Microsoft Azure.
- CO-9:** To build private cloud.
- CO-10:** Broadly educate with the impact of engineering on legal and societal issues involved.

**UNIT I CLOUD COMPUTING**

**15**

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

**UNIT II WEB-BASED APPLICATION**

**15**

Web-Based Application -Pros and Cons of Cloud Service Development – Types of Cloud Service Development– Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

**UNIT III CENTRALIZING EMAIL COMMUNICATIONS** **15**

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the CommUNITY – Collaborating on Group Projects and Events for the Corporation.

**UNIT IV COLLABORATING ON CALENDARS** **15**

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications –Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases– Storing and Sharing Files.

**UNIT V COLLABORATING VIA WEB-BASED COMMUNICATION** **15**

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

**TOTAL: 75 Hours**

**Text Books:**

1. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Michael Miller, Que Publishing, August 2008.
2. Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Haley Beard, Emereo Pty Limited, July 2008.

**Reference Books:**

1. Cloud computing a practical approach 2010, velete, Antony. T, TMH, 4<sup>th</sup> Edition, 2007.
2. Cloud computing with Windows Azure platform, Jennings, Roger, PHI, 2009.

**Course Objective:** This course introduces the advanced concepts of data sets, data processing, challenges including analysis, data sharing .and to predict analytics to extract value from data and achieve decisions for greater operational efficiency and reduce risks.

**Course Outcomes:**

**CO-1:** To understand Big data platform and qualities.

**CO-2:** To know about analytic process and tools.

**CO-3:** To understand modeling about Regression and Bayesian.

**CO-4:** To clarify fuzzy logic models and stochastic search methods.

**CO-5:** To understand stream data model and architecture.

**CO-6:** To know about real time analytic platform applications.

**CO-7:** To handle large data sets in main memory.

**CO-8:** To understand clustering techniques and methods.

**CO-9:** To clarify the concepts of Hadoop Distributed File system

**CO-10:** To understand analytics on emerging trends and technologies.

**UNIT I INTRODUCTION**

**15**

Introduction to BigData Platform – Traits of Big data -Challenges of Conventional Systems - Web Data – Evolution Of Analytic Scalability - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

**UNIT II REGRESSION MODELING**

**15**

Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Neural Networks: Learning And Generalization - Competitive Learning - Principal Component Analysis and Neural Networks - Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees - Stochastic Search Methods.

**UNIT III INTRODUCTION TO STREAMS CONCEPTS** **15**

Introduction To Streams Concepts – Stream Data Model and Architecture – Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

**UNIT IV MINING FREQUENT ITEMSETS** **15**

Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets in a Stream – Clustering Techniques – Hierarchical – K-Means – Clustering High Dimensional Data – CLIQUE And PROCLUS – Frequent Pattern based Clustering Methods – Clustering in Non-Euclidean Space – Clustering for Streams and Parallelism.

**UNIT V MAP REDUCE** **15**

Map Reduce – Hadoop, Hive, MapR – Sharding – NoSQL Databases - S3 - Hadoop Distributed File Systems – Visualizations - Visual Data Analysis Techniques - Interaction Techniques; Systems and Analytics Applications - Analytics using Statistical packages- Approaches to modeling in Analytics – correlation, regression, decision trees, classification, association-Intelligence from unstructured information-Text analytics-Understanding of emerging trends and technologies-Industry challenges and application of Analytics.

**TOTAL: 75 Hours**

**Text Books:**

1. Intelligent Data Analysis, Michael Berthold, David J. Hand, Springer, 2007.
2. Mining of Massive Datasets, AnandRajaraman and Jeffrey David Ullman, Cambridge University Press, 2012.
3. Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, Bill Franks, John Wiley & sons, 2012.

**Reference Books:**

1. Making Sense of Data, Glenn J. Myatt, John Wiley & Sons, 2007
2. Big Data Glossary, Pete Warden, O'Reilly, 2011.
3. Data Mining Concepts and Techniques, Jiawei Han, MichelineKamber, Elsevier, Second Edition, 2008.

**Course Objective:** This course introduces the concepts of XML and Web services. The design goal emphasizes simplicity usability across the internet and also gives the representation of arbitrary data structure for designing web pages and web services.

**Course Outcomes:**

- CO-1:** Understand, analyze and apply the role of markup languages like HTML, DHTML, and XML in the working of the web and web applications.
- CO-2:** Develop XML documents, XML DTD and XML Schema to formulate the web services.
- CO-3:** Able to write a XML application using structure and presentation technologies and apply XML manipulation technologies such as XSLT, XPath, XLink and XQuery.
- CO-4:** Gained knowledge on basic concepts of SOA and web service framework with respect to SOA.
- CO-5:** Able to design and launch Web services. To Use, in their own programs, Web services published by others.
- CO-6:** Employ the publish, find, bind architecture for Web services and to use the corresponding standards, in particular, Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description, Discovery and Integration (UDDI).
- CO-7:** Conceptually model Web services and formulate specifications of them in the Resource Description Framework (RDF) and the Web Ontology Language (OWL).
- CO-8:** Develop registration and discovery techniques for Web services.
- CO-9:** Apply principles of distributed transactions, business processes, business protocols, rules, and agents to specify, monitor, and manage the behavior of composed services.
- CO-10:** Develop web services and ensure security and to understand the need of semantic web.

**UNIT I INTRODUCTION**

**15**

Introduction -Role Of XML - XML and The Web - XML Language Basics - SOAP - Web Services - Revolutions Of XML - Service Oriented Architecture (SOA).

**UNIT II XML TECHNOLOGY****15**

Xml Technology -XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure.

**UNIT III SOAP****15**

Soap - Overview Of SOAP - HTTP - XML-RPC - SOAP: Protocol - Message Structure - Intermediaries - Actors - Design Patterns And Faults - SOAP With Attachments.

**UNIT IV WEB SERVICES****15**

Web Services- Overview - Architecture - Key Technologies - UDDI - WSDL - ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE.

**UNIT V XML SECURITY****15**

Xml Security- Security Overview - Canonicalization - XML Security Framework - XML Encryption - XML Digital Signature - XKMS Structure - Guidelines For Signing XML Documents - XML In Practice.

**TOTAL: 75 Hours****Text Book:**

1. XML, Web Services and the Data Revolution, Frank. P. Coyle, Pearson Education, 2002.

**Reference Books:**

1. Developing Java Web Services, Robert Skoczylas and Rima Patel Sriganesh, Wiley Publishing Inc, 2004.

2. Developing Enterprise Web Services, Sandeep Chatterjee, James Webber, Pearson Education, 2004.



**Course Objective:** This course introduces the basic concepts of data mining and warehousing. It also imparts the knowledge of discovering patterns in large set data involving artificial intelligence, machine learning and database system and the utilization of data warehousing.

**Course Outcomes:**

- CO-1:** To Learn basic of decision support systems and knowledge discovery, decision making.
- CO-2 :** To understand basic data warehouse structure and to learn how to gather and analyze large sets of data to gain useful business understanding.
- CO-3:** Learn the concept of database technology evolutionary path which has led to the need for data mining and its applications.
- CO-4:** Examine the types of data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
- CO-5:** Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems and make predictions of outcomes.
- CO-6:** Select and apply proper data mining algorithms to build analytical applications.
- CO-7:** Develop practical work of data mining techniques and design hypothesis based on the analysis to conceptualize a data mining solution to a practical problem.
- CO-8:** Design and implement of a data mining application using sample, realistic data sets and modern tools.
- CO-9:** To understand basic terms of data mining and algorithms to apply for real world business peoples.
- CO-10:** Design a effective web page by applying web mining.

**UNIT I INTRODUCTION**

**15**

Need for strategic information, Decision support system, knowledge discovery & decision making, need for data warehouse, definitions of Data warehousing and data mining, common characteristics of Data warehouse, Data Marts, Metadata, Operational versus analytical databases, trends and planning of Data warehousing.

**UNIT II DEFINING BUSINESS REQUIREMENTS 15**

Defining business requirements, Data modeling strategy, Fact tables, dimensions, Star schema and other schemas, Multi dimensional data models, Data Cube presentation of fact tables, using the Data warehouse, Designing tools for Data warehouse, OLAP models and operations.

**UNIT III ARCHITECTURAL COMPONENTS 15**

Architectural components, Infrastructure: Operational & Physical, Extraction, Transformation and Loading, Components of an Oracle Data warehouse, Data Transformation Functions, DBA responsibilities, Capacity Planning.

**UNIT IV IMPLEMENTATION OF DATA WAREHOUSE 15**

Implementation of Data warehouse, Physical design: steps, considerations, physical storage, indexing, Performance Optimization, Data warehouse deployment activities, Data security, backup and recovery concepts, Data warehouse Maintenance.

**UNIT V BASICS OF DATA MINING 15**

Basics of data mining, related concepts, Data mining techniques, Data Mining Algorithms -- Classification, Clustering, and Association rules, Knowledge Discovery in databases( KDD) Process, Introduction to Web Mining.

**TOTAL: 75 Hours**

**Text Books:**

1. Data Warehousing Fundamentals , Paulraj Ponnian, John Wiley,3<sup>rd</sup> Edition, 2004.
2. Data Mining Concepts and Techniques, Han Kamber, Morgan Kaufmann Publication, 2005

**Reference Books:**

1. Introduction to Business Intelligence and Data Warehousing, PHI, 2002.
2. The Data Warehouse Lifecycle toolkit, Ralph Kimball, John Wiley, 2005

**Course Objective:** This course introduces the fundamental concepts of Grid computing. This can also imparts the knowledge of web services and distributed object technology for grid computing and also about the open grid services infrastructure.

**Course Outcomes:**

**CO-1:** To understand the key concepts of grid computing and its toolkits.

**CO-2:** To design and develop grid based applications using its infrastructure.

**CO-3:** To gain a basic knowledge of Data management and transfer in Grid environments and Resource management.

**CO-4:** To encourage and to adapt their research problem in a Grid environment as a project.

**CO-5:** To be able to evaluate enabling technologies such as high-speed links and storage area networks for building computer grids.

**CO-6:** To utilize grid computing and clustering middleware, such as Parallel Virtual Machine (PVM), Message Passing Interface (MPI), HPC Portals, and Peer-to-Peer networks for implementing virtual super computing resources.

**CO-7:** To design a grid computing application in one of the key application areas e.g. Computer Animation, E-Research.

**CO-8:** To install a grid computing environment and develop communications skills and accept the code of professional conduct and practice through short presentations and group work.

**CO-9:** To know about the benefits of grid environments go beyond reduced cost and total cost of ownership, directly impacting bottom line financials and increasing productivity.

**CO-10:** To implement many of the early grid success stories have demonstrated the inherent business value of accelerating time to market, improving product quality, or improving collaboration within and between organizations.

**UNIT I INTRODUCTION**

**15**

Introduction and Overview of Grid Computing-Early Grid Activities-Current Grid Activities-An Overview of Grid Business Areas-Grid Applications- Grid Infrastructure.

**UNIT II WEB SERVICES AND RELATED TECHNOLOGIES 15**

Web Services And Related Technologies- Service – Oriented Architecture-Web Service Architecture-XML, Related Technologies, and Their Relevance to Web services-XML Messages and Enveloping-Service Message Description Mechanisms-Relationship between Web Service and Grid Service – Web Service Interoperability and the Role of the WS-I Organization.

**UNIT III DISTRIBUTED OBJECT TECHNOLOGY FOR GRID COMPUTING 15**

Distributed Object Technology For Grid Computing (OGSA)-Introduction to Open Grid Services Architecture(OGSA)- Commercial Data Center- National Fusion Collaboratory- The OGSA Platform Components.

**UNIT IV OPEN GRID SERVICES INFRASTRUCTURE 15**

Open Grid Services Infrastructure (OGSI)- Introduction-Grid Services-A High-Level Introduction to OGSI – Introduction to Service Data Concepts – Grid Service: Naming and Change Management Recommendations.

**UNIT V OGSA BASIC SERVICES 15**

OGSA Basic Services And The Grid Computing Toolkits- Common Management Model(CMM)-Security Architecture- GLOBUS GT3 Toolkit: Architecture- GLOBUS GT3 Toolkit: - Architecture, Programming model, High level services.

**TOTAL: 75 Hours**

**Text Books:**

1. Grid Computing, Joshy Joseph, Craig Fellenstein, Pearson/PHI PTR, 3<sup>rd</sup> Edition, 2003.
2. Grid Computing: A Practical Guide to technology and Applications, Ahmar Abbas, Charles River media, 2<sup>nd</sup> Edition, 2003.

**Reference Book:**

1. The Grid 2: Blueprint for a new computing infrastructure, Foster, Ian, and Carl Kesselman, Elsevier, 2003.

**Course Objective:** This course introduces the fundamental concepts of Client-Server Computing and also imparts the knowledge of client/server application for the development of application software.

**Course Outcomes:**

**CO-1:** To introduce the client server architecture and fundamentals of distributed systems.

**CO-2:** To make students familiar with Distributed computing environment, RMI and DCOM architecture.

**CO-3:** To Understand the enabling technologies for building Internet and Web database applications.

**CO-4:** To demonstrate the different components for developing client/server applications.

**CO-5:** To apply the techniques and features of the client/server development languages to construct a database application based on Internet.

**CO-6:** To describe the standards and techniques used to provide security in client/server environments

**CO-7:** To evaluate the degree of client/server computing that exists in a computing environment and the components that are present at each tier within a client/server environment.

**CO-8:** To design distributed applications using the Java Remote Method Invocation framework.

**CO-9:** To design web-based applications using JavaScript, Java servlet and Java server page.

**CO-10:** To design and implement multi-thread distributed applications.

**UNIT I CLIENT/SERVER COMPUTING**

**15**

Client/Server Computing – Advantages of Client / Server Computing Technology- Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.

**UNIT II COMPONENTS OF CLIENT/SERVER APPLICATIONS**

**15**

Components of Client/Server Applications – The Client: Role of a Client –Client Services – Request for Service. Components of Client/Server Applications – The Server:The Role of a Server – Server Functionality in Detail – The Network. Operating System –What are the Available Platforms – The Server Operating system.

**UNIT III COMPONENTS OF CLIENT/SERVER APPLICATIONS 15**

Components of Client/Server Applications – Connectivity: Open System Interconnect – Communications Interface Technology – Interprocess communication – WAN Technologies.

**UNIT IV COMPONENTS OF CLIENT/SERVER APPLICATIONS 15**

Components of Client/Server Applications–Software: Factors Driving demand for application software development – Rising Technology Staff costs – Need to improve Technology – Need for Common Interface across Platforms – Client/Server System Development Methodology. Components of Client/Server Applications–Hardware: Hardware/Network Acquisition – PC-Level Processing UNITS – Macintosh, notebooks UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.

**UNIT V COMPONENTS OF CLIENT/SERVER APPLICATIONS 15**

Components of Client/Server applications–Service and Support: System Administration. The Future of Client/Server Computing: Enabling Technologies – Transformational systems.

**TOTAL: 75 Hours**

**Text Book:**

1. Client/server computing, Patrick Smith, Steve Guenferich, Prentice Hall of India Private Limited, New Delhi, 2<sup>nd</sup> Edition, 2005.

**Reference Book:**

1. Client/server survival guide, Orfali, Robert, Dan Harkey, and Jeri Edwards, John Wiley & Sons, 2007.

**Course Objective:** This course introduces the fundamental concepts of Soft Computing and also imparts the knowledge of neural networks for various learning techniques and using recent trends to involve evolutionary and swarm intelligence based algorithms and bio-inspired computation.

**Course Outcomes:**

**CO-1:** To understand Artificial Neuron and Neural Network Architecture.

**CO-2:** To clear the various concepts of learning techniques.

**CO-3:** To explain the concepts of Back Propagation Networks.

**CO-4:** To understand the back propagation algorithm.

**CO-5:** To know the concepts of Fuzzy logic.

**CO-6:** To understand Fuzzy and crisp relations and conversions.

**CO-7:** To know the fuzzy membership and rules.

**CO-8:** To understand Fuzzyfication and Defuzzyfication

**CO-9:** To clarify working principles of genetic algorithm.

**CO-10:** To understand the concepts of genetic operators.

**UNIT I INTRODUCTION & ARCHITECTURE**

**15**

Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, Neural network architecture: single layer and multilayer feed forward networks, recurrent networks. Various learning techniques; perception and convergence rule, Auto-associative and hetro-associative memory.

**UNIT II BACK PROPOGATION NETWORKS**

**15**

Architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back propogation learning methods, effect of learning rule co-efficient ;back propogation algorithm, factors affecting backpropagation training, applications.

**UNIT III FUZZY LOGIC INTRODUCTION**

**15**

Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion.

**UNIT IV FUZZY MEMBERSHIP, RULES****15**

Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications & Defuzzificataions, Fuzzy Controller, Industrial applications.

**UNIT V GENETIC ALGORITHM****15**

Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.

**TOTAL: 75 Hours****Text Books:**

1. Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis and Applications, S. Rajsekaran & G.A. Vijayalakshmi Pai, Prentice Hall of India, 2<sup>nd</sup> Edition, 2001.
2. Artificial Intelligence and Intelligent Systems, N.P. Padhy, Oxford University Press, 2002.

**Reference Books:**

1. Neural Networks, Simon Haykin, Prentice Hall of India, 3<sup>rd</sup> Edition, 2004.
2. Fuzzy Logic with Engineering Applications, Timothy J. Ross, Wiley India, 2<sup>nd</sup> Edition, 2001.
3. Neural Networks, Kumar Satish, Tata Mc Graw Hill, 3<sup>rd</sup> Edition, 2002.

**15MCS108****FUZZY LOGIC****5 0 0 4**

**Course Objective:** This course introduces the concepts of Fuzzy Logic and imparts the knowledge of approximation reasoning, decision making and pattern recognition and image processing.

**Course Outcomes:**

- CO-1:** To understand the concept of fuzzy set and classical set.
- CO-2:** To clear the fuzzy tolerance and equivalence relations.
- CO-3:** To know the membership functions and boundaries.
- CO-4:** To impart Fuzzyfication and Defuzzyfication methods.



**CO-5:** To inculcate fuzzy tautologies, contradictions.

**CO-6:** To instill Fuzzy rule based system, natural language.

**CO-7:** To clarify Fuzzy nonlinear simulation and FAMs

**CO-8:** To illuminate Fuzzy decision making and synthetic evaluation

**CO-9:** To irradiate Fuzzy classification and cluster validity

**CO-10:** To understand Fuzzy pattern recognition and image processing.

## **UNIT I INTRODUCTION**

**15**

Introduction – Classical sets and Fuzzy Sets – Classical sets – fuzzy sets – sets as points in hyper cubes – classical relations and fuzzy relations – Cartesian product – crisp relations – fuzzy relations – tolerance and equivalence relations – fuzzy tolerance and equivalence relations – Value assignments.

## **UNIT II MEMBERSHIP FUNCTIONS**

**15**

Membership functions – Features of the membership functions – standard forms and boundaries – Fuzzification – Membership value assignments – Fuzzy to crisp conversions – Lambda cuts for fuzzy sets – Lambda cuts for fuzzy relations – Defuzzification methods – Fuzzy arithmetic, numbers, vectors and the extension principle – Extension principle – Fuzzy numbers – Interval Analysis in arithmetic – Approximate methods of extension – Fuzzy vectors.

## **UNIT III CLASSICAL LOGIC AND FUZZY LOGIC**

**15**

Classical logic and fuzzy logic – Classical predicate logic – fuzzy logic – approximate reasoning – fuzzy tautologies, contradictions, equivalence and logical proofs – other forms of the implication operation – other forms of the composition operation – Fuzzy rule based system – natural language – linguistic hedges – rule based systems – graphical techniques of inference.

## **UNIT IV SIMULATION AND DECISION MAKING**

**15**

Fuzzy nonlinear simulation – fuzzy relational equations – partitioning – nonlinear simulation using fuzzy rule based systems – fuzzy associative memories (FAMs) – Fuzzy decision making – fuzzy synthetic evaluation – fuzzy ordering – preference and consensus – multi-objective decision making - fuzzy Bayesian decision method – decision making under fuzzy states and fuzzy actions .

## UNIT V CLASSIFICATION

15

Fuzzy classification – classification by equivalence relations – cluster analysis – cluster validity – c-Means clustering – classification metric – hardening the fuzzy c-Partition – similarity relations from clustering – Fuzzy pattern recognition – feature analysis – partitions of the feature space- single sample identification - multi feature pattern recognition – image processing – syntactic recognition.

**TOTAL: 75 Hours**

### **Text Book:**

1. Fuzzy Logic With Engineering Applications, Timothy J Ross, Tata McGraw Hill, 2<sup>nd</sup> Edition, 2000.

### **Reference Book:**

1. Ross, Timothy J. Fuzzy logic with engineering applications. John Wiley & Sons, 2009.

**15MCS109**

**ARTIFICIAL NEURAL NETWORKS**

**5 0 0 4**

**Course Objective:** This course introduces the fundamental concepts of Artificial Neural Networks and also about the different heuristics models and structures and sequences of knowledge based approaches.

### **Course Outcomes:**

**CO-1:** To Understand the basic concept of Neural Networks, Inference and Learning.

**CO-2:** To know the models such as Classification Models, Association Models, Optimization Models, and Self-Organization Models.

**CO-3:** To explain the difference between supervised and unsupervised learning.

**CO-4:** To impart the knowledge about Types of Neural Networks.

**CO-5:** To understand the Incremental learning concepts

**CO-6:** To clear the knowledge based Approaches in Incremental learning.

**CO-7:** To clarify various models in Heuristics.

**CO-8:** To be well versed in Symbolic Methods and NN Methods.

**CO-9:** To clear the concepts of Structures, Sequences and Spatio-temporal Neural Networks.

**CO-10:** Learning Procedures Knowledge based Approaches.

**UNIT I INTRODUCTION TO NEURAL NETWORKS** **15**

Introduction to Neural Networks – Basic Concepts of Neural Networks – Inference and Learning – Classification Models – Association Models – Optimization Models – Self-Organization Models.

**UNIT II SUPERVISED AND UNSUPERVISED LEARNING** **15**

Supervised and Unsupervised Learning – Statistical Learning – AI Learning – Neural Network Learning – Rule Based Neural Networks – Network Training – Network Revision-Issues- Theory of Revision- Decision Tree Based NN – Constraint Based NN.

**UNIT III INCREMENTAL LEARNING** **15**

Incremental learning – Mathematical Modeling – Application of NN- Knowledge based Approaches.

**UNIT IV HEURISTICS** **15**

Heuristics- Hierarchical Models – Hybrid Models – Parallel Models – Differentiation Models- Control Networks – Symbolic Methods- NN Methods.

**UNIT V STRUCTURES AND SEQUENCES** **15**

Structures and Sequences – Spatio-temporal NN – Learning Procedures – Knowledge based Approaches.

**TOTAL: 75 Hours**

**Text Book:**

1. Neural Networks in Computer Intelligence, L. Fu, Tata McGraw Hill, 1994.

**Reference Books:**

1. Artificial Neural Networks, R. J. Schalkoff, Tata McGraw Hill, 1997.
2. An Introduction to Neural Network, Anderson, PHI, 2001.

**Course Objective:** This course introduces the basic concepts of artificial intelligence and expert systems and also imparts the knowledge of predictions and how to monitor and acquire knowledge.

**Course Outcomes:**

**CO-1:** Basic Knowledge about the concepts of Artificial Intelligence Production systems.

**CO-2:** Design and implement appropriate AI solution techniques for such problems.

**CO-3:** Ability to apply knowledge representation, reasoning, and machine learning techniques to real world problems.

**CO-4:** To Understand the Hill Climbing concepts and Best-First Search.

**CO-5:** Ability to learn Predicate logic and Representing Instance and relationships.

**CO-6:** To know the concept of Forward and Backward Reasoning.

**CO-7:** Introduction to Non Monotonic Reasoning and statistical reasoning.

**CO-8:** Implement appropriate learning algorithms such as decision trees, support vector machines, and boosting.

**CO-9:** To learn the concept of Neural Networks and Expert Systems

**CO-10:** To impart the basic idea about Knowledge acquisition.

**UNIT I INTRODUCTION**

**15**

What is Artificial Intelligence? The AI Problems – The Underlying Assumptions – What is an AI Techniques? Problems: Problems spaces and search – Defining the Problems as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programmes.

**UNIT II CONCEPTS**

**15**

Generate – and-Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction – Means – Ends – Analysis-Knowledge -Representation issues: Representation and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation – The Frame Problem

**UNIT III PREDICATE LOGIC**

**15**

Using predicate logic – Representing Simple facts in Logic – Representing Instance and Is a relationships – Computable functions and Predicates – Resolutions – Natural Deductions –

Representing Knowledge Using Rules: Procedural versus Declarative Knowledge – Forward versus Backward Reasoning – Matching – Control Knowledge

#### **UNIT IV MONITORING AND REASONING**

**15**

Symbolic Reasoning under uncertainty – Introduction to Non Monotonic Reasoning – Logics for Non Monotonic Reasoning – Implementation issues – Augmenting a Problem solver – Implementation: Depth – First Search – Implementation : Breadth – First Search – Statistical reasoning – Bayesian Networks – Fuzzy Logic- Learning: What is learning? – Rote Learning – Learning by taking advice – Learning in Problem Solving

#### **UNIT V CONNECTIONIST MODELS**

**15**

Introduction – Hopfield Networks – Learning in Neural Networks – Applications of Neural Networks – Expert Systems –Representing and Using Domain Knowledge – Expert System Shells – Explanation – Knowledge acquisition.

**TOTAL: 75 Hours**

#### **Text Books:**

1. Artificial Intelligence, Elaine Rich, Kevin Knight, TataMcGraw Hill, 2<sup>nd</sup> Edition, 1991.
2. Introduction to Artificial Intelligence and Expert Systems, Dan W.Patterson, Prentice Hall of India, 2<sup>nd</sup> Edition, 1992.
3. Artificial Intelligence, A Modern Approach, Stuart J. Russell and Peter Norvig, Pearson Education, 2<sup>nd</sup> Edition, 2003.
4. Artificial Intelligence, A New Synthesis, Nils J. Nilsson, Harcourt Asia Pvt.Ltd, 2005.

#### **Reference Books:**

1. Machine learning: An artificial intelligence approach, Michalski, Ryszard S., Jaime G. Carbonell, and Tom M. Mitchell, Springer Science & Business Media, 2013.
2. Multiagent systems: a modern approach to distributed artificial intelligence, Weiss, Gerhard, MIT press, 1999.

**Course Objective:** This course introduces the basic concepts of Object Oriented Analysis and Design, components of OOAD and testing in OOAD and also introduces the quality assurance tests.

**Course Outcomes:**

- CO-1:** Understand the fundamental aspects of object oriented analysis and design, in terms of “how to use” it for the purpose of specifying and developing software.
- CO-2:** Explore and analyze different analysis and design models, such as OO Models, Structured Analysis and Design Models, etc.
- CO-3:** Understanding the insight and knowledge into analyzing and designing software using different object-oriented modeling techniques.
- CO-4:** To apply Object Oriented Analysis Processes for projects and design GUI prototypes for software applications.
- CO-5:** Design databases to support the software applications and document them using UML diagrams like class diagrams, sequence diagrams, use case diagrams, activity diagrams etc.
- CO-6:** Develop an appreciation for and understanding of the risks inherent to large-scale software development.
- CO-7:** Develop an understanding of the application of OOAD practices from a software project management perspective
- CO-8:** Ability to analyze, design and construct complicated software applications to industry standards.
- CO-9:** Ability to learn test plan, test cases, continuous testing and debugging principles with real time scenarios.
- CO-10:** Identify current industry standards for information system development using CASE tools.

**UNIT I SYSTEM DEVELOPMENT**

**15**

Object Basics - Development Life Cycle – Software Development Process-Building High Quality Software-Methodologies - Patterns – Pattern Templates-Anti Patterns-Capturing Patterns-Frameworks - Unified Approach – UML-UML Diagram-Class Diagram-Use Case Diagram.

**UNIT II OBJECT ANALYSIS****15**

Object Analysis: Classification Theory-Noun Phrase Approach-Common Class Patterns Approach- Use-Case Models - Object Relations - Attributes - Methods - Class And Object Responsibilities - Case Studies.

**UNIT III DESIGN PROCESSES****15**

Design Axioms: Design Pattern – Design Classes-Object Oriented Design-Refining Attributes-`Designing Methods And Protocols- Object Storage - Object Interoperability - Case Studies.

**UNIT IV: USER INTERFACE DESIGN****15**

View Layer: Design-Macro Level Process-Micro Level Process-Purpose-Prototypes-View Layer Classes - View Layer Interface - Case Studies.

**UNIT V: QUALITY ASSURANCE TESTS****15**

Testing Strategies - Object Orientation On Testing - Test Cases - Test Plans - Continuous Testing - Debugging Principles - System Usability - Measuring User Satisfaction - Case Studies.

**Total: 75 Hours****Text Books:**

1. Object Oriented Systems Development, Ali Bahrami, Tata McGraw Hill ,2<sup>nd</sup> Edition, 1999
2. Object Oriented Analysis and Design, G. Booch, Addison Wesley, 2<sup>nd</sup> Edition, 1999,
3. Software Engineering, R.S.Pressman, Tata McGraw Hill, 6<sup>th</sup> Edition,2005
4. Object Oriented Modeling And Design, Rumbaugh, Blaha, Premerlani , Eddy, Lorensen, Pearson education, 2003 .

**Reference Books:**

1. Object Oriented Analysis & Design, Atul Kahate, Tata McGraw-Hill Education, 2004
2. The Approach: Integrating Object Oriented Design and Formal Verification, Ahrendt, Wolfgang et al, Springer Berlin Heidelberg, 2000.

**Course Objective:** This course introduces the basic concepts of Image processing and imparts the knowledge of image transformation, enhancement, restoring and compression of images and about the techniques used for digital image processing.

**Course Outcomes:**

- CO-1:** To clear digital image fundamentals.
- CO-2:** To know the elements of visual perception, sampling and quantization.
- CO-3:** To understand the Fourier Transform for Image transformation.
- CO-4:** To clarify two dimensional Fourier transforms.
- CO-5:** To enhance the image by spatial domain and frequency domain method.
- CO-6:** To know the types of filters to enhance the image.
- CO-7:** To understand circulant matrices and Block Circulant matrices.
- CO-8:** To clear the Effects of Diagonalization on the Degradation Model.
- CO-9:** To illuminate image compression models.
- CO-10:** To understand fundamental coding theorems.

**UNIT I DIGITAL IMAGE FUNDAMENTALS**

**15**

**Introduction:** Background, Digital Image Representation, Fundamental Steps in Image Processing, Elements of a Digital Image Processing System.- **Digital Image Fundamentals:** Elements of Visual Perception, A Simple Image Model, Sampling and Quantization, Some Basic Relationships between Pixels, Imaging Geometry.

**UNIT II IMAGE TRANSFORMS**

**15**

**Image Transforms:** Introduction to the Fourier Transform, The Discrete Fourier Transform, Some Properties of the Two-Dimensional Fourier Transform, Other Separable Image Transforms.

**UNIT III IMAGE ENHANCEMENT**

**15**

Spatial Domain Methods, Frequency Domain Methods, Some Simple Intensity Transformations, Histogram Processing, Image Subtraction, Image Averaging, Background, Smoothing Filters, Sharpening Filters, Lowpass Filtering, Highpass Filtering, Generation of Spatial Masks from Frequency Domain Specifications.



#### **UNIT IV IMAGE RESTORING**

**15**

Degradations Model - Definitions, Degradation Model for Continuous Functions, Diagonalization of Circulant and Block-Circulant Matrices, Circulant Matrices, Block Circulant Matrices, Effects of Diagonalization on the Degradation Model, Algebraic Approach to Restoration, Unconstrained Restoration, Constrained Restoration, Inverse Filtering – Formulation, Removal of Blur Caused by Uniform Linear Motion, Restoration in the Spatial Domain, Geometric Transformation.

#### **UNIT V IMAGE COMPRESSION**

**15**

Fundamentals – Coding Redundancy, Interpixel Redundancy, Psychovisual Redundancy, Fidelity Criteria. Image Compression Models – The Source Encoder and Decoder, The Channel Encoder and Decoder. Elements of Information Theory – Measuring Information, The Information Channel, Fundamental Coding Theorems, Using Information Theory. Error-Free Compression – Variable-Length Coding, Bit-Plane Coding, Lossless Predictive Coding. Lossy Compression – Lossy Predictive Coding, Transform Coding.

**TOTAL: 75 Hours**

#### **Text Book:**

1. Digital Image Processing, Rafael. C. Gonzalez & Richard E.Woods. Pearson Education, 2<sup>nd</sup> Edition, 2006

#### **Reference Books:**

1. Digital Image Processing , W.K.Pratt, John Wiley & sons, Inc.3<sup>rd</sup> Edition, 2006
2. Image Processing, Analysis and Machine Vision, M. Sonka , Thomson, Learning,2<sup>nd</sup> Edition,2007.

**Course Objective:** This course introduces the basic concepts of testing the quality of the software project with various types of testing and the levels of testing using various methodologies. This course elaborately explains about levels of testing and testing process.

**Course Outcomes:**

**CO-1:** To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.

**CO-2:** Have an ability to apply software testing knowledge and engineering methods.

**CO-3:** To apply a wide variety of testing techniques in an effective and efficient manner.

**CO-4:** Have an ability to design and conduct a software test process for a software testing project.

**CO-5:** Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.

**CO-6:** Have an ability to use software testing methods and modern software testing tools for their testing projects.

**CO-7:** Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.

**CO-8:** Able to conduct tests at various levels to check the flow of data and control, and to check the code after integrating.

**CO-9:** Able to understand quality of software at thread levels by identifying faults.

**CO-10:** Able to plan and monitor the development of software systematically using software specification and design document.

**UNIT I INTRODUCTION TO QUALITY**

**15**

Software quality, fundamentals of software testing, VV model of testing-Phases of Software project-Planning, design, development of coding, testing, development and maintenance-Testing and Deployment and maintenance.

**UNIT II FUNCTIONAL TESTING**

**15**

Boundary value Testing, Equivalence class testing, Decision Table based testing, Retrospection-Types of Testing-White Box-Black Box-Integration-System and Acceptance-Performance and Regression.

**UNIT III STRUCTURAL TESTING****15**

Path Testing: Basics, Loops-Predicates, Path Predicates-Path Sensitizing-Implementation And Application. Data Flow Testing: Basics-Data Flow Testing Strategies-Applications-Tools-Effectiveness- Retrospection.

**UNIT IV LEVELS OF TESTING****15**

Integration Testing, System Testing, Interaction Testing. Object Oriented Testing : Issues, Class Testing, Object Oriented Integration Testing, Object Oriented System Testing.

**UNIT V TESTING PROCESS****15**

Planning, Metrics: Types-Project Metrics-Progress Metrics-Productivity Metrics And Reports, Quantitative And Qualitative Analysis, Improvements.

**TOTAL: 75 Hours****Text Books:**

1. Software Testing Principles, Techniques and Tools, M.G. Limaye , TMH.
2. Software Testing A Craftman's Approach, Paul C. Jorgensen, CRC Press, Second Edition.

**Reference Books:**

1. Software Testing tools, Prasad, K.V.K.K, TMH, 2009
2. Software testing in the real world : Improving the process, Kit, Edward, PHI, 1995

**Course Objective:** This course introduces the basic concepts of Software Quality Control and Assurance with different quality measures and standards for real time software projects as case studies.

**Course Outcomes:**

**CO-1:** Understanding the system quality and standards by learning the software tasks, management Responsibility and Purchasing Product Traceability.

**CO-2:** Quality system can be developed with the knowledge about managerial responsibilities, Quality System, Contract Review, Design Control and Document Control.

**CO-3:** Software quality can be built with proper knowledge of organizing software management with the help of software quality program.

**CO-4:** Learning principles of software defect prevention method which helps the student to avoid obstacles in building quality software.

**CO-5:** Learning some metrics like customer problem, customer satisfaction, Lines of codes helps in designing quality software product.

**CO-6:** Learning analysing strategy for software quality metrics and quality management strategy helps in acquiring knowledge for developing a quality system.

**CO-7:** Quality program can be built with knowledge of establishing the quality program, assurance planning, purpose and scope.

**CO-8:** Establishment of software quality program with Standard and Goals, planning and testing the program helps in improving the quality.

**CO-9:** Understanding the standards and models of software helps in gathering ideas about role of software quality assurance development.

**CO-10:** Comparative study of SEI CMM Level 5 model and ISO9000 Model helps in acquiring the basic knowledge about standardization and models.

**UNIT I INTRODUCTION**

**15**

Quality And The Quality System - Standards And Procedures Technical Activities. Software Tasks - Management Responsibility - Quality System - Contract Review - Design Control - Document Control - Purchasing Product Identification And Traceability.

## **UNIT II PROCESS CONTROL**

**15**

Checking - Identification Of Testing Tools - Control Of Nonconforming Product - Corrective Action- Verification:Verification techniques – Inspections, reviews, walk-throughs – Case studies.

## **UNIT III QUALITY AUDITS**

**15**

Handling, Storage, Packing And Delivery - Quality Records - Internal Quality Audits - Training - Servicing - Statistical Techniques-Views On Quality – Cost Of Quality - Quality Models – Quality Frameworks – Verification And Validation – Defect Taxonomy – Defect Management – Statistics And Measurements – IEEE Standards – Quality Assurance And Control Processes

## **UNIT IV QUALITY ASSURANCE TECHNOLOGIES**

**15**

QA And New Technologies - QA and Human - Computer interface - Process Modeling - Standards And Procedures- Coverages: Block, Conditions, Multiple Conditions, MC/DC, Path – Data Flow Graph – Definition And Use Coverages – C-Use, P-Use, Defclear, Def-Use – Finite State Machines – Transition Coverage

## **UNIT V INDIAN STANDARDS**

**15**

ISO –ISO Standards-Development Process-ISO Certification-ISO Consulting Services And Consultants-E-Business- 9001 - Elements Of ISO 9001 - Improving Quality System - Case Study.

**TOTAL: 75 Hours**

### **Text Books:**

1. Managing the software process, Watts S. Humphrey ,Addison Wesley, 1999.
2. Software Quality Assurance a Practical Approach, Tsum S.Chow ,IEEE Computer Society press, 1985.

### **Reference Books:**

1. Software Engineering , Richard E. Fairley , A Practitioner’s approach, McGraw Hill, 1982.
2. Software quality Assuarance from theory to implementation, Daniel Galin, Pearson Education, 2<sup>nd</sup> Edition, 2004

**Course Objective:** This course introduces the basic concepts of software Engineering such as Planning, Design, Coding, Quality Assurance, Formal Verification, Code Metrics, Test Plans, Walk through and Distributed database.

**Course Outcomes:**

**CO-1:** Identify, formulate, analyze, and solve problems, as well as identify the computing requirements appropriate to their solutions.

**CO-2:** Ability to Learn Software Requirement Specifications

**CO-3:** Learn to design software and apply strategies of project management

**CO-4:** Apply rapid software development methods and decide on appropriate software architecture.

**CO-5:** To study and practice methods for analysis, design, testing, and implementation of large, complex software systems

**CO-6:** Design, implement, and evaluate software-based systems, or programs of varying complexity that meet desired needs, satisfy realistic constraints, and demonstrate accepted design and development principles.

**CO-7:** To study the various perspectives on software quality and change management

**CO-8:** Use current techniques, skills, and tools necessary for professional practice.

**CO-9:** Understand ability to engage in life-long maintenance and continuing Software development.

**CO-10:** Think critically about ethical and social issues in software engineering for different applications.

**UNIT I INTRODUCTION TO SOFTWARE ENGINEERING**

**15**

Definitions - Size Factors - Quality and Productivity Factors - Managerial Issues - Planning a software project: Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organization structure - Other Planning Activities.

**UNIT II SOFTWARE COST ESTIMATION**

**15**

Software cost factors - Software Cost Estimation Techniques - Staffing-level Estimation - Estimating Software Maintenance Costs - The Software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specification.

**UNIT III SOFTWARE DESIGN****15**

Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations - Design Techniques - Detailed Design Considerations - Real-Time and Distributed System Design - Test Plans - Milestones, walkthroughs, and Inspections.

**UNIT IV IMPLEMENTATION ISSUES****15**

Structured Coding Techniques - Coding Style - Standards and Guidelines - documentation guidelines -Type Checking - Scoping Rules - Concurrency Mechanisms.

**UNIT V QUALITY ASSURANCE****15**

Walkthroughs and Inspections - Static Analysis - Symbolic Execution - UNIT Testing and Debugging - System Testing - Formal Verification: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Source Code Metrics - Other Maintenance Tools and Techniques.

**TOTAL: 75 Hours****Text Books:**

1. R.Fairley, Software Engineering Concepts, Tata McGraw-Hill Edn. 1997.
2. R.S.Pressman, Software Engineering, Fourth, Ed., McGraw Hill, 1997.

**Reference Books:**

1. Behforooz & Hudson ,Software Engineering Fundamentals, PHI,1996 .
2. Pressman, Roger S, Software Engineering: A Practitioners Approach, 6 Ed, TMH,2005.

**Course Objective:** This course introduces the basic concepts of mobile computing such as LAN, IEEE, Network Layer, Transport Layer, GSM, Protocols, Multiplexing, Adhoc networks and Tunneling .

**Course Outcomes:**

**CO-1:** Introduce various wireless systems and standards and their basic operation cases.

**CO-2:** Learn to model radio signal propagation issues and analyze their impact on communication system performance.

**CO-3:** Understand how the various signal processing and coding techniques of GSM and its Architecture.

**CO-4:** Understand the techniques of radio spectrum allocation in multi-user systems and their impact on networks capacity.

**CO-5:** To have a in depth knowledge about various wireless LAN technique.

**CO-6:** To Learn to simulate wireless networks and analyze the simulation results.

**CO-7:** To appreciate the contribution of Wireless Communication networks to overall technological growth.

**CO-8:** To understand the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.

**CO-9:** To provide the student with an understanding of advanced multiple access techniques

**CO-10:** To provide the student with an understanding of diversity reception techniques

**UNIT I INTRODUCTION**

**15**

Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing –Wireless Transmissions –Multiplexing – Spread Spectrum and Cellular Systems- Medium Access Control – Comparisons.

**UNIT II SYSTEM TYPES**

**15**

Telecommunication Systems – GSM – Architecture – Sessions –Protocols – Hand Over and Security – UMTS and IMT – 2000 – Satellite Systems- Types of Satellite System- Routing- Localization - Handover.



**UNIT III LAN****15**

Wireless Lan – Infra Red vs Radio Transmission- IEEE S02.11 – Architecture- Physical Layer- Medium Access Control Layer- MAC Management- Hiper LAN – Bluetooth – Security and Link Management.

**UNIT IV NETWORK LAYER****15**

Mobile network layer - Mobile IP – Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Encapsulation- Dynamic Host Configuration Protocol- Adhoc Networks – Routing Strategies.

**UNIT V TRANSPORT LAYER****15**

Mobile transport layer - Congestion Control – Implication of TCP Improvement – Mobility – Indirect – Snooping – Mobile – Transaction oriented TCP - TCP over wireless – Performance.

**TOTAL: 75 Hours****Text Books:**

1. J. Schiller, Mobile Communications, 2<sup>nd</sup> edition, Pearson Education, Delhi, 2003.
2. Hansmann, Merk, Nicklous, Stober, Principles of Mobile Computing, 2<sup>nd</sup> Edition, Springer (India) 2004.
3. Pahlavan, Krishnamurthy, Principle of wireless Networks: A unified Approach, Pearson Education, 2003, Delhi.

**Reference Books:**

1. Martyn Mallick, 2004, Mobile and Wireless Design Essentials, Wiley Dreamtech India Pvt. Ltd., New Delhi.
2. W.Stallings, 2004, Wireless Communications and Networks, 2<sup>nd</sup> Edition, Pearson Education, Delhi.

**SYLLABUS**

**GENERIC ELECTIVES**

**Course Objective:** To build web applications using HTML and client side script technologies use with Microsoft's IIS. To build web applications with style sheets and Data object in order to provide secure web design

**Course Outcomes:**

- CO-1:** Apply the knowledge of the internet concepts in understanding the web application development.
- CO-2:** Understand, analyze and apply the role of markup languages like HTML, DHTML, and XML in the working of the web and web applications.
- CO-3:** Use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards.
- CO-4:** Ability to create JavaScript programs that apply new programming skills to model real-world problems.
- CO-5:** Ability to learn real-world web application using JavaScript to create dynamic, interactive web applications.
- CO-6:** Understand the basic structure and function of the Object in JavaScript and to recognize the different object methods to use in a given scenario.
- CO-7:** Understand, analyse and build dynamic web pages using client side programming like VBScript and JavaScript and also develop the web application using ASP.NET and JSP.
- CO-8:** Create web-based distributed applications using C#, ASP.NET, SQL Server and ADO.NET
- CO-9:** Justify the ethical and security issues in information systems management.
- CO-10:** Understanding the impact of web designing in the current market place where everyone use to prefer electronic medium for shopping, commerce, fund transfer and even social life also.

**UNIT I INTRODUCTION**

**15**

Internet Basic - Introduction to HTML - List - Creating Table - Linking document Frames - Graphics to HTML Doc - Style sheet - Style sheet basic - Add style to document - Creating Style sheet rules - Style sheet properties - Font - Text - List - Color and background color - Box - Display properties.

**UNIT II JAVASCRIPT FUNDAMENTALS** **15**

Introduction to Javascript - Advantage of Javascript Javascript Syntax - Datatype - Variable - Array - Operator and Expression - Looping Constructor - Function - Dialog box.

**UNIT III OBJECTS IN JAVASCRIPT** **15**

Javascript document object model - Introduction - Object in HTML - Event Handling - Window Object - Document object - Browser Object - Form Object - Navigator object Screen object - Build in Object - User defined object - Cookies.

**UNIT IV ASP.NET FUNDAMENTALS** **15**

ASP. NET Language Structure - Page Structure - Page event, Properties & Compiler Directives. HTML server controls - Anchor, Tables, Forms, Files. Basic Web server Controls- Label, Textbox, Button, Image, Links, Check & Radio button, Hyperlink. Data List Web Server Controls - Check box list, Radio button list, Drop down list, List box, Data grid, Repeater.

**UNIT V NETWORK & SECURITY** **15**

Request and Response Objects, Cookies, Working with Data - OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced Issues - Email, Application Issues, Working with IIS and page Directives , Error handling. Security - Authentication, IP Address, Secure by SSL & Client Certificates.

**Total: 75 Hours**

**Text Books:**

1. Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Pen CGI, I. Bayross, BPB Publications, 2000.
2. ASP3.0 Programming Bible, Eric A. Smith, Wiley-Dreamtech India (P) Ltd, 2003.

**Reference Books:**

1. ASP 3.0 Beginners Guide, Dave Mercer, Sixth reprint, Tata McGraw-Hill Edition 2004.
2. Mastering Javascript, J. Jaworski ,BPB Publications, 1999.
3. Complete Reference HTML, T. A. Powell, TMH, Third Edition, 2002.

**Course Objective:** This course gives introduction to the concepts of ASP, VB Script and Java Script, Working with ASP.NET to enhance communication and security and to develop web page.

**Course Outcomes:**

- CO-1:** Use operators, variables, arrays, control structures, functions and objects in JavaScript.
- CO-2:** Identify popular JavaScript Libraries.
- CO-3:** Understanding programming concepts
- CO-4:** Ability to work with the functions of JavaScript
- CO-5:** Apply JavaScript best practices
- CO-6:** Use the DOM / Interactivity with elements
- CO-7:** Understand, analyze and apply the role of languages like HTML, Javascript, VBScript and protocols in the workings of the web and web applications
- CO-8:** Analyze a web page and identify its elements and attributes.
- CO-9:** Create web pages using HTML.
- CO-10:** Create web pages using JavaScript

**UNIT I INTRODUCTION**

**15**

Introduction to` VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants -VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions – date functions – string functions – other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object

**UNIT II JAVA SCRIPT**

**15**

Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type – Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .

### **UNIT III OBJECT MODEL**

**15**

Javascript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.

### **UNIT IV ASP.NET**

**15**

ASP.NET Language Structure – Page Structure – Page event , Properties & Compiler Directives . HTML server controls – Anchor, Tables, Forms, Files . Basic Web server Controls – Lable, Text box, Button, Image Links, Check & radio Button, Hyperlink, Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.

### **UNIT V SECURITY**

**15**

Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives, error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates

**Total: 75 Hours**

#### **Text Books:**

1. Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Pen CGI, I. Bayross, BPB Publications, 2000.
2. Mastering Active Server Pages 3, A.Russell Jones, BPB Publications, 2009.

#### **Reference Books:**

1. Internet Programming with VBScript and JavaScript, Kathleen Kalata, Thomson learning, 2001.
2. XML Harness the Power of XML in easy steps, Mike McGrath, Dreamtech Publications.
3. Mastering Javascript, J.Jaworski, BPB Publications, 1999.
4. JavaScript: The Complete Reference, Powell, Thomas; Schneider, Fritz, TMH, 2nd edition 2004.

**Course Objective:** To understand the fundamentals of Photoshop & can able to retouch & repair, Work with multiple layers, Slice & clone, Design basic web templates, and create animations.

**Course Outcomes:**

**CO-1:** Ability to make color corrections.

**CO-2:** Manage assets by using the tools available in Adobe Photoshop.

**CO-3:** Ability to convert black and white photo to color photo

**CO-4:** Understanding the approach of color corrections.

**CO-5:** Ability to use basic selection tools and edge refinement to isolate and edit parts of an image.

**CO-6:** Gain competency in creating composite images that demonstrate advanced selection and layering techniques.

**CO-7:** Improved working knowledge on adjustment layers in image coloration and exposure.

**CO-8:** Ability to create stylish image by combining filters with blending and masks.

**CO-9:** Gain knowledge to evaluate and correct image imperfections using the Info panel.

**CO-10:** Ability to print with variety of techniques and papers

**UNIT I BASICS OF ADOBE PHOTOSHOP**

**15**

Learn The Tools And What They Do-- Basic Workflow- Creating Effective Storing- Batch Renaming- How To Save Your Photos- Digital Asset Management- File Types- File Sizes- Color Types.

**UNIT II LAYERS**

**15**

Layer Styles-Layers Palette-Working With Layers-New Layersvia Cut-New Layers Via Copy- Hiding/Showing Layers-Repositioning Layers-Flattening Images-Working With Adjustment Layers-Layer Effects- Opacity- Adjustment Layers.

**UNIT III BASIC RETOUCHING**

**15**

Color Manipulations- Levels- Curves- Seeing Color Accurately- Patch Tool- Cropping- Reading Your Palettes- Dust and Scratches.

## **UNIT IV ADVANCED RETOUCHING**

**15**

Smoothing Skin-Strategy for Retouching-Resolution and Image Size-Cropping and Image-Adjusting the tonal image-Removing a Color Cast- Smoothing Wrinkles- Special Color Effects: Black And White, Sepia, Grainy.

## **UNIT V WORKING WITH A LOT OF IMAGES**

**15**

Cataloging Your Images- Editing Our Photoshoot- Naming Your Shoot- Automating Your Shoot- Batch Processing- Introduction to Action.

**TOTAL: 75 Hours**

### **Text Books:**

1. Fundamental Photoshop, Greenberg, Tata McGraw- Hill, 1995
2. Photoshop 7, The Ultimate Reference, Laurie Ann Ulrich, Dream Tech Press, 2002

### **Reference Books:**

1. Photoshop CS2 in Simple Steps, Shalini Gupta, Adity Gupta, Dreamtech Press, 2006.
2. Adobe Photoshop CS6 Bible, Lisa Danae Dayley, Brad Dayley, Wiley India, 2012.

**15MCS154**

**FLASH**

**5 0 0 4**

**Course Objective:** This course provides hands-on experience with Adobe Flash, a Web-authoring and animation tool. Students gain understanding of fundamental Flash paradigms (Stage, Symbols, Library, Timeline) and Create simple, tasteful animation effects . Students use Buttons and ActionScript to enable basic user interaction.

### **Course Outcomes:**

**CO-1:** To work with the basic library functions and editing tools.

**CO-2:** To be able to blend colors and to work with droppers and paint buckets.

**CO-3:** To be able to work with different text fields.

**CO-4:** To work with modifying the shapes with the help of menu commands.

**CO-5:** To understand the basic rules of defining variables in creating the personalities and illusions.

**CO-6:** To create animations with the help of copy motion commands.



**CO-7:** To be able to work with filters and to give effects to the animations.

**CO-8:** To work with masking of layers and to distribute various effects in to the layers.

**CO-9:** To be able to work with large sized files and applying sound effects in the files.

**CO-10:** To be able to create a small animation with the sound effects.

## **UNIT I SYMBOLS, INSTANCES, AND THE LIBRARY 15**

Understanding the Document Library - Defining Content Types- Editing Symbols- Modifying Instance Properties -Slice Scaling for MovieClip Backgrounds - Color Basics - Working in the Swatches Panel - Using the Color Panel - Working with Droppers, Paint Bucket, and Ink Bottles.

## **UNIT II WORKING WITH TEXT AND GRAPHICS 15**

Text Field Types in Flash - The Text Tool and the Property Inspector - Font Export and Display - Sampling and Switching Fills and Strokes - Transforming Gradients and Bitmap Fills - Gradient Transform Used for Lighting Effects - Applying Modify Shape Menu Commands - Free Transform Commands and Options - Modifying Item Types - Using the History Pane.

## **UNIT III ANIMATION STRATEGIES 15**

Establishing Ground Rules -Defining Variables - Adding Personality - Manipulating Perceptions and Illusion - Understanding the Laws of Nature - Timeline Animation - Basic methods of Flash Animation -Frame-by-Frame Animation - Modifying Multiframe Sequence -Using Tweens for Animation -Integrating Multiple Animation Sequence - Organizing Symbol Instances on the Main Timeline -Reusing and Modifying Symbol Instances - Duplicating Tweened Animation Properties with the Copy Motion Command.

## **UNIT IV APPLYING FILTERS, EFFECTS AND LAYER TYPES 15**

Applying Filters in Flash -Controlling Color -Layering Graphics with Blend Mode -Using Timeline Effects for Graphics and Animation - Motion Guides -Mask Layers - Motion Guides and Movie Clip Masks -Using Distribute to Layers.

## **UNIT V CHARACTER ANIMATION TECHNIQUES 15**

Working with Large File Sizes -Some Cartoon Animation Basics - Animator's Keys and Inbetweening -Coloring the Art -Flash Tweening-.Adding- Sound Identifying- Sound File Import and Export Formats -Importing Sounds into Flash -Assigning a Sound to a Button - Adding Sound to the Timeline.

**Text Books:**

1. Adobe Flash CS3 Professional, Robert Reinhardt, Snow Dowd, Wiley Publishing, 2007.
2. Flash 5 for PC/MAC, Sami Ben-Yahia, ENI, 2001.

**Reference Books:**

1. Flash in a Flash Web Development, Anushka Wirasinha, PHI, 2002.
2. Flash 8 ActionScript Bible, Lott, Joey, John Wiley & Sons, 2006.

**15MCS155**

**ADVANCED EXCEL**

**5 0 0 4**

**Course Objective:** This course provides concepts of Advance Excel such as Financial Functions, Date and Time Functions, VLookup, Analysis Tool Pack, various advanced formatting methods and analytical tools..

**Course Outcomes:**

**CO-1:** Familiar to create and use defined names in a workbook

**CO-2:** Aware of using Filters

**CO-3:** Knowledge of applying date and time function in Excel

**CO-4:** Understand and use a range of lookup and reference Function.

**CO-5:** Obtain skill to create summaries in spreadsheets using subtotals

**CO-6:** Ability to draw charts and graphs using formulas.

**CO-7:** Gain practical stub to implement variety of data validation techniques

**CO-8:** Acquire skill to Perform what-if analysis.

**CO-9:** Understand and create simple PivotTables

**CO-10:** Construct and operate PivotTables using some of the more advanced techniques

**UNIT I INTRODUCTION**

**15**

Understanding Excel's Files, Ribbon and Shortcut : Create a workbook - Enter data in a worksheet - Format a worksheet - Format numbers in a worksheet - Create an Excel table - Filter data by using an AutoFilter - Sort data by using an AutoFilter.

**UNIT II DATE AND TIME****15**

Working with Dates and Times & Text: Working with Dates & Time, Creating Formulas that Manipulate Text – Upper, Proper, Lower, Concatenate, Text to column- Creating Formulas That Count, Sum, Subtotal: Create a formula - Use a function in a formula - Creating Formulas That Look Up Values: VLookup, HLookup, Match & Index .

**UNIT III FINANCIAL FUNCTIONS****15**

Creating Formulas for FINANCIAL Applications: Introduction to formulas e.g. PV, PMT, NPER, RATE, Creating Balance Sheet, Investment Calculations, Depreciation calculations- Creating Charts and Graphics: Chart your data, Creating Sparkline Graphics, Using Insert Tab Utilities.

**UNIT IV FORMATTING****15**

Using Custom Number Formats: Right click, Format Cells window - Using Data Tab and Data Validation: Getting external Data, Remove Duplicates, Apply data validation & using utilities from Data Tab - Protecting Your Work: Using Review Tab Utilities - Performing Spreadsheet What-If Analysis: Create a macro - Activate and use an add-in

**UNIT V ANALYSIS****15**

Analyzing Data with the Analysis Tool Pack: Anova, Correlation, Covariance, Descriptive Statistics, Histogram, Random Number Generation, Rank and Percentile, Regression, t-Test, Z Test - Using Pivot Tables for Data Analysis: Create Data Base for Pivot, Analyzing Data with Pivot Tables, Producing Report with a Pivot

**TOTAL: 75 Hours****Text Books:**

1. Excel 2010 Bible, John Walkenbach, John Wiley & Sons, Edition 2010.
2. Mastering Financial modeling in Microsoft excel, Day, Alastair, Pearson Education, 2<sup>nd</sup> Edition, 2007.

**Reference Books:**

1. Excel 2007 for Dummies, Greg Harvey, John Wiley & Sons, 2006
2. New Perspectives on Microsoft Office Excel 2007, June Jamrich Parsons , Dan Oja , Roy Ageloff , Patrick Carey, Course Technology; 1 edition, 2013

**Course Objective:** This course introduces concepts of Statistical Package for Social Sciences and working with the computation of data and comparative statistics and comparative testing methods.

### **Course Outcomes**

**CO-1:** Understand the background and introduction of SPSS

**CO-2:** Familiar with Structure of SPSS

**CO-3:** Acquire the skill to perform the basic workings of SPSS, and basic statistical analyses.

**CO-4:** Obtain the knowledge to implement basic statistical concepts such as Regression.

**CO-5:** Gain practical knowledge to perform database management tasks.

**CO-6:** Knowledge of interpreting data.

**CO-7:** Get idea to implement descriptive statistics using SPSS.

**CO-8:** Construct and implement comparison statistics.

**CO-9:** Obtain Knowledge of implementing non parametric statistics.

**CO-10:** Learn to apply ANNOVA in SPSS

### **UNIT I INTRODUCTION**

**15**

Brief description and history of SPSS - Running SPSS and the Initial window(s) - Running SPSS - The Initial SPSS window(s) Overview the Title Bar the Menu Bar The (Power) Tool Bar The Data Editor (Data View and Variable view) The Status Bar

### **UNIT II OVERVIEW**

**15**

Sample SPSS session Overview of this exercise -Open File - List Cases - Frequencies - Explore - Graphics - Non Parametric Wilcoxon Test - Correlation - Regression

### **UNIT III COMPUTATION**

**15**

Creation of a small data file and computation of new variables Overview- Preliminary considerations about data structures -Creation of a data dictionary -Entering data - Moving around the data - Editing data - Computation of new (or existing variables)

### **UNIT IV COMPARITIVE STATISTICS**

**15**

Data entry - Descriptive statistics-. Examining assumptions of parametric statistics - Test for normality- Test for homogeneity of variances- Transformations-Comparative Statistics : Comparing means among groups

## UNIT V COMPARISON TEST

15

Comparing two groups using parametric statistics -Two-sample t-test -Paired T-test - Comparing two groups using non-parametric statistics - Mann Whitney U test - Comparing three or more groups using parametric statistics - One-way ANOVA and post-hoc tests - Comparing three or more groups using non-parametric statistics - Kruskal-Wallis test - For studies with two independent variables

**TOTAL: 75 Hours**

### Text Books:

1. Discovering Statistics Using IBM SPSS Statistics, Andy Field, SAGE Publications Ltd, 4<sup>th</sup> edition, 2013.
2. SPSS: Stats Practically Short and Simple, Sidney Tyrrell, Ventus Publishing, 2009.

### Reference Books:

1. SPSS for you, Rajathi.A, MJP Publishers, 2010.
2. SPSS for Dummies, Arthur Griffith, John Wiley Publications, 2007.

**15MCS157**

**PROGRAMMING IN TALLY**

**5 0 0 4**

**Course Objective:** This course introduces the basic computer concepts of Tally and how to work with inventory information, about the configuration, management information system using Tally Software.

### Course Outcomes:

- CO-1:** To understand the concepts of financial accounting, utility of accounting, advantages and limitations of accounting.
- CO-2:** Helps to work with well-known accounting software.
- CO-3:** Gain the knowledge of the origin and features of Tally accounting software and inventory features.
- CO-4:** Detailed study about classification of accounts, terms used in accounting and fundamental conventions, principles and concepts of accounting.
- CO-5:** Learn to create the inventory masters, stock groups, stock categories and features of Tally for inventory accounting.
- CO-6:** Learn to Copying Masters, Set Credit Limits & Credit Periods for Debtors &/or Creditors, Advance options for automatic calculation of interest.

- CO-7:** To understand the Introduction to Voucher Screen of Tally, Voucher Header, Voucher Body, To Save Voucher, To Modify saved voucher, To Print Voucher online Learn about a Payment Voucher, a Receipt Voucher, and Use of Voucher Configuration Option (F12).
- CO-8:** To understand about Sales and Purchase Account, Concept of Sales Returns/ Returns Inwards, Concept of Purchase Returns or Returns Outwards, Concept of multiple Sales & Purchase Accounts, Sales Voucher and Purchase Voucher.
- CO-9 :** To learn about Purchase procedure in a company Purchase Order, Receipt of Goods, Purchase invoice, Purchase Returns, Sales procedure in a company, Sales Order, Dispatch of Goods, Sales invoice, Sales return, Inventory Reports, Reports pertaining to inventory.
- CO-10:** To learn the Advanced Features of Tally Printing & Housekeeping, Backup & Restore, etc. To manage a Business and Introduction to Cost Centres, Cost Categories, Provisional Vouchers, MIS Reports.

## **UNIT I INTRODUCTION**

**15**

Financial accounting, what is accounting, utility of accounting, advantages of accounting, book of accounts- cash book, journal, general ledger, classification of accounts and rules of debit and credit, financial statement-trial balance – Introduction to Computerized Accounting Software Tally – Features of Tally – Differences between Manual Accounting and Computerized Accounting – Company Creation.

## **UNIT II FEATURES AND CONFIGURATION**

**15**

Features, General features, accounting features- Inventory features-Set modify other company features- : Configure- general. Accounts Info: Single and multiple ledgers, conversion of name, duplicate name, accounts info, accounts info menu- F11: features, F12: Configuration, Account group- Ledger accounts-budgets creation of budgets, period of budget, set/alter budgets, types of budget. Voucher types- create a new voucher type, method of numbering, and creation of manufacturing journal, display, alter, voucher class.

## **UNIT III INVENTORY INFORMATION**

**15**

Inventory info menu: F11: Features- inventory features. F12: Configure-Inventory masters - Stock Group- Stock Categories- Stock categories- Stock items- Godowns. Inventory Vouchers: F11: Features -F12: Configuration- Inventory Allocation-invoicing configuration of invoice info menu – Inventory Vouchers - printing inventory vouchers - Accounting Reports-Display: Display options at Gateway, Access from the Gateway, and layout of

display screen, buttons.F12: Range, F12: Values, New column, Alter column, delete column, auto column, Balance sheet- Trial balance- Accounts books. Statement of accounts- Daybook, list of accounts.

#### **UNIT IV MIS REPORTS**

**15**

Ratio Analysis, cash and funds- cash flow, funds flow. Purchase bills pending, sales bills pending, exception reports- negative stock, negative ledger, overdue payable, memorandum voucher, and Reverse journal voucher, optional voucher.

#### **UNIT V HOUSEKEEPING**

**15**

Backup-backup strategy. Restore, rewriting. Security: Password, security control, types of security, create new security level- name of security level, use basic facilities of, days allowed for back-dated vouchers. Users and passwords.

**TOTAL: 75 Hours**

#### **Text Books:**

1. Accounting System, M. Sulochana, K. Kameswara rao & R. Kishore Kumar, Kalyani Publishers, 2009.
2. Tally Financial Accounting Programme, Tally India Pvt. Ltd.,

#### **Reference Books:**

1. Tally Tutorial Accounts, A.K. Nadani.
2. Tally power of Simplicity – Tally Gold Quick reference manual, Tally India Pvt. Ltd.,

**15MCS158**

**OFFICE AUTOMATION TOOLS**

**5 0 0 4**

**Course Objective:** This course introduces the basic computer concepts and various problem solving methods, including word processing, Calculations using Spreadsheet applications and Data storage using Database management.

#### **Course Outcomes:**

**CO-1:** To understand the Evolution of Computers,Classification of Computers.

**CO-2:** Abilityto understand about Modern Digital Computer,Overview of Operating System, types of software.

**CO-3:** To understand about Word Basics,Formatting Features,and Editing Text &Paragraphs.

**CO-4:** Creating Mail Merge, Macros, Tables,Graphics and Frames.

**CO-5:** Formatting a Worksheet &Creating Graphic Objects.

**CO-6:** Working With Graphsand Creating Charts.

**CO-7:** Creating a New Database using MSACCESS.

**CO-8:** Finding Information in Databases, Creating Reports, Importing Data from Other Databases.

**CO-9:** Creating and Formatting a Presentation.

**CO-10:** Adding Picture and Graph, Adding Sound and Video to the presentation.

**UNIT I FUNDAMENTALS OF COMPUTER 15**

Evolution of Computers - Classification of computers – Definition of Hardware - CPU – Inputs/Outputs – Storage Devices - Types of software - Overview of Operating System – Multitasking OS –Overview of modern digital computer.

**UNIT II MS WORD 15**

Word Processing Programs and Their Uses – Word basics – Formatting features - Editing Text & Paragraphs- Automatic Formatting and Styles –Mail merge–Working with tables-Graphics and Frames – Macro - Special Features of Word – Automating your work and printing Documents- Desktop Publishing Service – Converting doc into www pages.

**UNIT III MS EXCEL 15**

Spreadsheet Programs – applications – Menus-Commands-Toolbars – Working & Editing in Workbook – Creating Formats & Links – Formatting A worksheet & Creating graphic objects – Calculations – Working with Formula - Organizing data, importing data, functions – data handling – Working with Graphs - Creating charts - Managing workbooks.

**UNIT IV MS ACCESS 15**

Introduction - Planning a Database - Starting Access - Data Types and Properties - Creating a New Database - Creating Tables - Working with Forms - Creating queries - Finding Information in Databases - Creating Reports - Types of Reports - Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

**UNIT V MS POWERPOINT 15**

Getting Started in PowerPoint – Creating a presentation - Setting Presentation style - Adding text to the Presentation - Formatting a Presentation - Adding style, Color - Arranging objects - Adding Header & Footer - Creating and Editing slides – Slide layout – Adding picture and graph – Adding sound and video – Adding auto shape - custom animation - Previewing a slide show.

**TOTAL: 75 Hours**



**Text Books:**

1. Computing Fundamentals & C Programming, E.Balagurusamy , Tata McGrawhill.
2. MS office 2000, Sanjay Saxena, Vikas Publication House Pvt.Ltd.

**Reference Books:**

- 1.Microsoft Office 2003 : The Complete Reference, Jennifer Ackerman Kettell , Guy Hart-Davis , Curt Simmons , McGraw-Hill Osborne, 2nd edition,2003.
2. Office Automation & Word Processing, Balaguruswamy, TMH.

**15MCS159                      SYSTEM ADMINISTRATION AND MAINTENANCE                      5 0 0 4**

**Course Objective:** To create an awareness of various components of Computer Systems, To learn to maintain, upgrade, and troubleshoot your PC system. To Provide experience in upgrading and repairing Personal Computers.

**Course Outcomes:**

- CO-1:** To create an awareness of Trouble Shooting PC.
- CO-2:** To Understand the concept of BIOS.
- CO-3:** To learn basics about Disks Trouble Shooting.
- CO-4:** To learn basics about Drives Trouble Shooting.
- CO-5:** To understand the concepts of Mother Board.
- CO-6:** To learn, maintain and upgrade Mother Board Trouble Shooting.
- CO-7:** To understand the fundamental Memory concepts.
- CO-8:** To maintain, upgrade and Trouble Shooting Memory.
- CO-9:** To learn the concepts of Printer Technology.
- CO-10:** To get experience in Upgrading and Repairing printers.

**UNIT I TROUBLESHOOTING GENERAL PC PROBLEMS                      15**

Troubleshooting General PC Problems: Introduction, General Troubleshooting rules, Common Problems & Solutions, Preventive Maintenance. BIOS: Typical Motherboard BIOS, BIOS Features, BIOS & Boot Sequences, BIOS Shortcoming & Compatible Issues, BIOS Troubleshooting, BIOS Upgrades.

**UNIT II DISK AND DRIVE TROUBLE SHOOTING                      15**

Hard Disk: Introduction, Disk Basics, Disk Performance & Characteristics, Drive, Construction, Drive Testing & troubleshooting.

**UNIT III MOTHER BOARD** **15**

Motherboard & Buses: Introduction, Motherboard Components, Expansion Slots system Bus Functions & Features. Upgrading & Troubleshooting Motherboard, General Bus.

**UNIT IV BASIC MEMORY CONCEPTS** **15**

Basic Memory Concepts: Introduction, Installing Memories, Upgrade Options & Strategies, Replacing Memories with Higher Capacity. Troubleshooting Memory.

**UNIT V PRINTERS** **15**

Printers: Printer Technology, How Printer Works, Attaching Printer, Installing printer. Drivers, Preventive Maintenance, Common Printer Problems & Solution Error Code: Beep Code, Post Code, Post Reader Card.

**TOTAL: 75 Hours**

**Text Books:**

1. Upgrading & Repairing PCs, Scott Muller, Que Publications, 10th Edition ,2004
2. Complete PC Upgrade & Maintenance Guide, Mark Minas, BPB Publishers, 5th Edition, 2004.

**Reference Book:**

1. Understanding and deploying LDAP directory services, Howes, Timothy A., Mark C. Smith, and Gordon S. Good, Addison-Wesley Longman Publishing Co., Inc., 2003.

**15MCS160**

**DESKTOP PUBLISHING**

**5 0 0 4**

**Course Objective:** This course introduces the basic concepts of desk top publishing and working with the computers and its setup, about document designing and about file printing management.

**Course Outcomes:**

**CO-1:** Ability to understand different operating systems and its working principles for a desktop computer.

**CO-2:** To implement sending and receiving e-mails and working with internet.

**CO-3:** To identify the function of each component of the Desktop Publishing document: content provider, layout specialist, designer.

**CO-4:** To implement the effects of word processor formats when placing files into a Desktop Publishing program.

**CO-5:** To apply principles of good page layout and design to create single and multiple page documents containing graphic illustrations.

**CO-6:** To create a document with no formatting and place it into a PageMaker document using Desktop Publishing software where the text will be formatted and composing.

**CO-7:** To locate and select or create appropriate graphic illustrations; crop, resize and edit illustrations as necessary using graphic editing software.

**CO-8:** To use the graphic tools in the Desktop Publishing program to add graphic effects such as borders, rules, shading, colors, gradients, and stroke size and style.

**CO-9:** To design Invitations and Compiling Books with proper spacing or padding.

**CO-10:** Ability to choose the correct printer from the network and properly print either one sided or two sided, long edge binding or short edge binding.

## **UNIT I FUNDAMENTALS OF COMPUTERS 15**

Introduction to computers, Hardware and software – Applications of computers – Input devices – Output devices – Storage media – Types of software- Operating Systems – Introduction to DOS – DOS commands and tools – MS-Windows – Using the Desktop – Setup using Control Panel – Windows accessories – Files & Folder Management - Introduction to Internet – Browsers – sending and receiving e-mail – file downloading and uploading.

## **UNIT II DOCUMENT SET UP 15**

History of printing – types of printing - Desktop publishing: Introduction – Merits & Demerits – DTP and Traditional composing – cost & estimation of DTP UNIT – Word Processing using MS-Word: Basics – text formatting – setting header and footer – tables, borders and shading –Special effects and image insertion.

## **UNIT III TYPING AND COMPOSING PAGES 15**

Typography – Managing Fonts – Measurement types for fonts, pages, lines – Proof reading – Page setup – House styles – Page Maker case study - Page Composing - different composing methods and processes – composing machines – Output devices – Qwark Express case study

## **UNIT IV DOCUMENT DESIGNING 15**

Graphic Reproduction – Setting tones, shadowing, highlight, contrast for images - Scanning principles – Types of scanners and their use – Setting resolution – Page design – Color types – Color selection - Preparation of graphics – Book preparation – Seminar presentation – Imposition techniques

## UNIT V FILE & PRINT MANAGEMENT

15

Printing – Types of printers – Different types of file formats – ICC based color management  
– Preparation of Project work – Binding techniques – CorelDraw Case Study

**TOTAL: 75 Hours**

### Text Books:

1. Rapidex DTP Course, Shirish Chavan, UNICORN Books Pvt. Ltd., 2007
2. A First Course in Computers, Sanjay Saxena, Vikas Publishing House, 2005.

### Reference Book:

1. Misanchuk, Earl R. Preparing instructional text: Document design using desktop publishing. Educational Technology, 1992.

**15MCS161**

**MYSQL**

**5 0 0 4**

**Course Objective:** This course introduces the basic concepts, various queries, triggers and stored routine of Mysql. And also gives the Cursor management, event management and user management of Mysql.

### Course Outcomes:

**CO-1:** Establish a basic understanding of the analysis and design of a database.

**CO-2:** Understanding the process of a Database Development and Administration using SQL.

**CO-3:** Enhance Programming and Software Engineering skills and techniques using SQL.

**CO-4:** Establish a basic understanding of background materials needed for technical support using SQL.

**CO-5:** Solve a Database problems using Oracle 9i SQL by applying SQL commands to Create, Insert, Update, and Retrieve a simple database.

**CO-6:** Understand the service provided by a Database Management System and application of the Relational Database Model.

**CO-7:** Understand Transaction Processing and Multi-user Database support between a Production transaction database and a Data Warehouse.

**CO-8:** Understand the Client/Server structures used in Database Management Systems.

**CO-9:** Design and Implement a basic database using the Oracle Database Management System and PHPMyAdmin to create dynamic websites for visitors.

**CO-10:** Applying the concept of how to filter data based upon multiple conditions Updating and inserting data into existing tables and relationships between tables will affect the SQL.

**UNIT I INTRODUCTION TO SQL BASICS 15**

Introduction: To Databases, Relational and Non-relational database system MySQL as a Non-procedural Language. View of data. SQL Basics : Statements, names (table & column names), data types, Creating Database, inserting data, Updating data, Deleting data, expressions, built-in-functions, missing data CREATE, USE, ALTER, RENAME, SHOW, DESCRIBE And DROP, PRIMARY KEY FOREIGN KEY (One and more columns) Simple Validity checking using CONSTRAINTS.

**UNIT II SIMPLE, NESTED, SUBQUERIES 15**

Simple queries: The SELECT statement Multi-table queries: Simple joins (INNER JOIN), SQL considerations for multitable queries (table aliases, qualified column names, all column selections self joins). Nested Queries: Using sub queries, sub query search conditions, sub queries & joins, nested sub queries, correlated sub queries, sub queries in the HAVING clause. Simple Transaction illustrating START, COMMIT, and ROLLBACK.

**UNIT III MYSQL TRIGGERS AND STORED ROUTINE 15**

MySQL Triggers: Basics of Trigger, Create and drop a trigger, Find all triggers in database. MySQL Stored Routine: Stored Routine, Create and invoke a stored routine, Alter a stored routine, Drop a stored routine.

**UNIT IV MYSQL CURSOR MANAGEMENT AND EVENTS 15**

Utilize functionalities of MySQL Cursor: Basics of Cursor, Defining the cursor, Retrieve values from cursor, Close the cursor. MySQL Events: Events, Turning event scheduler on Create the event, Find all events in database, Chang the event and Drop the event.

**UNIT V USER MANAGEMENT, BACKUP AND RECOVERY 15**

User Management in MySQL: Basics of MySQL User, Access Control List, Manage User Accounts, GRANT and REVOKE Command, Reset Root Password. Backup and Recovery: Back up MySQL, Uses for backup, Backup Frequency, Copy database into another machine, Recovery from crashes.

**TOTAL: 75 Hours**

**Text Books:**

1. SQL a complete reference, Alexis Leon & Mathews Leon, TMG.
2. Learning MySQL, Seyed M. M. and Hugh Williams, O'REILLY.
3. MySQL Administrator, Sheeri Cabral.

**Reference Book:**

1. MySQL in a Nutshell, Dyer, Russell. O'Reilly Media, Inc., 2008.

**15MCS162****CYBER LAW****5 0 0 4**

**Course Objective:** This course will make you familiar with the Computer & Web Technology, Investigating Crimes, E-Commerce, Cyber Space – Cyber Crime, Net-Neutrality.

**COURSE OUTCOMES:**

**CO-1:** Knowledgeably awaked with the basics of cyberspace and cyber law.

**CO-2:** To know the importance of cyber law and its principles.

**CO-3:** To familiarize the international perspectives in cyber law.

**CO-4:** To know the councils were the source is wealth of knowledge.

**CO-5:** To understand the freedom of speech and expression in cyberspace.

**CO-6:** To understand the importance of data protection principles in cyberspace.

**CO-7:** To know the cybercrimes against individual and society.

**CO-8:** To clarify the various offences and laws against it.

**CO-9:** To understand about the defamation of individual or an organization.

**CO-10:** To know about the copyright protection of GUI tools with case studies.

**UNIT I INTRODUCTION****15**

Computers and its Impact in Society - Overview of Computer and Web Technology - Need for Cyber Law -Cyber Jurisprudence at International and Indian Level

**UNIT II CYBER LAW - INTERNATIONAL PERSPECTIVES****15**

UN & International Telecommunication Union (ITU) Initiatives - Council of Europe - Budapest Convention on Cybercrime - Asia-Pacific Economic Cooperation (APEC) - Organization for Economic Co-operation and Development (OECD) - World Bank - Commonwealth of Nations

**UNIT III CONSTITUTIONAL & HUMAN RIGHTS ISSUES IN CYBERSPACE 15**

Freedom of Speech and Expression in Cyberspace - Right to Access Cyberspace – Access to Internet - Right to Privacy - Right to Data Protection

**UNIT IV CYBER CRIMES & LEGAL FRAMEWORK 15**

Cyber Crimes against Individuals, Institution and State - Hacking - Digital Forgery - Cyber Stalking/Harassment -Cyber Pornography -Identity Theft & Fraud - Cyber terrorism - Cyber Defamation - Different offences under IT Act, 2000

**UNIT V CYBER THREATS 15**

Cyber Defamation - Different Types of Civil Wrongs under the IT Act, 2000 - Intellectual Property Issues in Cyber Space - Interface with Copyright Law - Interface with Patent Law - Trademarks & Domain Names Related issues

**TOTAL: 75 Hours**

**Text Books:**

1. Computer Law, Chris Reed & John Angel, OUP, New York, 2007.
2. Cyber Laws, Justice Yatindra Singh, Universal Law Publishing Co, New Delhi, 2012.
3. Legal Dimensions of Cyber Space, Verma S, K, Mittal Raman, Indian Law Institute, New Delhi, 2004

**Reference Books:**

1. Cyber Law, Jonthan Rosenoer, Springer, New York, 1997.
2. The Information Technology Act, 2005: A Handbook, Sudhir Naib, OUP, New York, 2011