

DETAILED SYLLABUS
MASTER OF SCIENCE (COMPUTER SCIENCE)
(MSC(CS))
(EFFECTIVE FROM JULY 2011)



Department of Computer Applications

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**SCHEME FOR
MASTER OF SCIENCE (COMPUTER SCIENCE)
MSC(CS)
(Effective From July 2011 Session)**

SEMESTER -I

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
1MSC(CS)1	Information and Communication Technology	4			80	20		100
1MSC(CS)2	Operating Systems (Dos Windows & Linux)	4			80	20		100
1MSC(CS)3	Programming with C	4	1	3	80	20	25	125
1MSC(CS)4	PC Packages	4	1	3	80	20	25	125
1MSC(CS)5	Communicative English	4			80	20		100
Semester Total								550

(*L-Lecture, T-Tutorial, P-Practical)

SEMESTER -II

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
2MSC(CS)1	Data structures and Algorithms using C	4			80	20		100
2MSC(CS)2	Digital Electronics and Computer Organization	4			80	20		100
2MSC(CS)3	Programming with Visual Basic.Net	4		3	80	20	25	125
2MSC(CS)4	Object Oriented Programming with C++	4	1	3	80	20	25	125
2MSC(CS)5	Principles of Management	4			80	20		100
Semester Total								550

SEMESTER -III

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
3MSC(CS)1	Computer Networks	4			80	20		100
3MSC(CS)2	Database Management System	4			80	20		100
3MSC(CS)3	Software Engineering	4			80	20		100
3MSC(CS)4	Programming with ASP.Net	4	1	3	80	20	25	125
3MSC(CS)5	Programming with Java	4	1	3	80	20	25	125
Semester Total								550

SEMESTER -IV

Subject Code	Subject Name	Scheme			Theory Paper	Internal Evaluation	Practical Exams	Total Marks
		L	T	P				
4MSC(CS)1	Linux Server Administration	4			80	20	25	125
4MSC(CS)2	Advanced Java	4	1	3	80	20	25	125
4MSC(CS)3(A)	Elective Data Warehousing & Mining	4		3	80	20		100
4MSC(CS)3(B).	Software Testing & Project Management							
4MSC(CS)3(C)	Information Security							
4MSC(CS)4	Project Work		4	4		40	160	200
Semester Total								550

General Instructions:

- For passing the subject examination minimum 40% marks must be separately scored in Theory Paper, Practical Exams and Internal Evaluation in the subject.
- For passing the semester, minimum aggregate marks must be 45% in the semester.

Course: - MSC(CS)
Sub Code: 1MSC(CS)1

Semester: I
Subject Name- Information and Communication Technology

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers, Generations of computers, Personal Computer (PCs) - evolution of PCs, Basic components of a computer System - Control unit, ALU, Input/Output functions and characteristics, Memory - RAM, ROM, EPROM, PROM and other types of memory.	8					8	
UNIT - II Input/Output & Storage Units-: Keyboard, Mouse, Trackball , Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Light Pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch,.	8					8	
UNIT - III Video Standard - VGA, SVGA, XGA etc, Printers& types -, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card ,Speakers, Storage fundamentals - Primary Vs Secondary memory .Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, flash drives MMC Memory cards,	8					8	
UNIT – IV Software and its Need, Types of Software - System software, Application software, System Software - Operating Systems Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS, Windows, Linux, Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types – Word processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Virus working principles, types of viruses, virus detection and prevention,	8					8	
UNIT-V Use of communication and IT, Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of Network - LAN, WAN, MAN, Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Bridges, Internet-Evolution, World Wide Web .	8					8	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>COMPUTER TODAY'S.K BASANDRA, , GALGOTIA PUBLICATIONS.</i> • <i>FUNDAMENTALS OF INFORMATION TECHNOLOGYALEXIS LEON & MATHEWS LEON, VIKAS PUBLISHING</i> • <i>DOS QUICK REFERENCE RAJEEV MATHUR, " GALGOTIA PUBLICATIONS</i> 							

Course: - MSC(CS)
 Sub Code: 1MSC(CS)2

Semester: I
 Subject Name- Operating Systems (DOS, Windows, Linux)

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I DISK OPERATING SYSTEM (DOS): Introduction, History & Versions of DOS, DOS Basics - Physical Structure of Disk, Drive Name, FAT, File and Directory Structure and Naming Rules, Booting Process, DOS System Files. DOS Commands: Internal - DIR, MD, CD, RD, COPY, COPY CON, DEL, REN VOL, DATE, TIME, CLS, PATH, TYPE, VER etc. External - CHKDSK, XCOPY, PRINT, DISKCOPY, DOSKEY, TREE, MOVE, LABEL, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc, Executable V/s Non Executable Files in DOS.	8	4				12	
UNIT-II WINDOWS XP: Introduction to Windows XP and its Features, Hardware Requirements of Windows. Windows Concepts, Windows Structure, Desktop, Taskbar, Start Menu, My Pictures, My Music, My Documents, Working with Recycle Bin - Restoring a deleted file, Emptying the Recycle Bin. Managing Files, Folders and Disk - Navigating between Folders, Manipulating Files and Folders, Creating New Folder, Searching Files and Folders. My Computer - Exploring Hard Disk, Copying and Moving Files and Folder from One Drive to Another, Formatting Floppy Drive, Windows Explorer and its Facilities, Using Floppy, CD, DVD, Pen Drive, Burning CD. Windows Accessories - Calculator, Notepad, Paint, WordPad, Command Prompt. Entertainment- Media Players, Sound Recorder, Volume Control, Movie Maker.	8	4				12	
UNIT-III ADVANCED FEATURES OF WINDOWS XP: Managing Hardware & Software - Installation of Hardware & Software, Using Scanner Web Camera, Printers. System Tools - Backup, Character Map, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information, System Monitor, Disk Cleanup, Using Windows Update. Browsing the Web with Internet Explorer, Multiple User Features of Windows, Creating and Deleting User, Changing User Password, etc. Accessibility Features of Windows - Sharing Folders and Drives, Browsing the Entire Network, Using Shared Printers. OLE - Embed/Link Using Cut and Paste an Embed/ Link, Using Insert Object Manage Embedded/Linked Object.	8	4				12	
UNIT-IV LINUX: History & Features of Linux, Linux Architecture, File System of Linux, Hardware Requirements of Linux, Various flavors of Linux, Linux Standard Directories, Functions of Profile and Login Files in Linux, Linux Kernel.	8	4				12	
UNIT-V WORKING WITH LINUX: KDE & Gnome Graphical Interfaces, Various Types of Shell Available in Linux, Multi-User Features of Linux, Login and Logout from Linux System, Linux commands - bc, cal, cat, cd, clear, cmp, cp, mv, date, find, ls, pwd, mkdir, more, rm, rmdir, chgrp, chmod, chown, tty, wc, who, whois, grep, telnet, vi editor, Using Floppy, CD-ROM and Pen Drive in Linux, Permissions and Ownerships,	8	4				12	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>DOS QUICK REFERENCE BY RAJEEV MATHUR, GALGOTIA PUBLICATIONS LINUX COMPLETE BY BPB PUBLICATIONS</i> • <i>PETER NORTON COMPLETE GUIDE TO LINUX BY PETER NORTON, TECHMEDIA PUBLICATIONS</i> • <i>LEVEL MODULE M 1.1 INFORMATION TECHNOLOGY BY KHANNA BOOK PUBLICATIONS, NEW DELHI</i> • <i>WINDOWS XP COMPLETE REFERENCE, BPB PUBLICATION</i> 							

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I Overview of C, Features of C, IDE of C, Structure of C Program, Compilation & Execution of C Program., Identifiers, Variables, Expression, Keywords, Data Types, Constants, Scope and Life of Variables - Local and Global Variable, Operators: Arithmetic, Logical, Relational, Conditional and Bitwise Operators, Precedence and Associativity of Operators, Types Conversion in Expression, Basic Input/Output And Library Functions Single Character Input/Output i.e. getch(), getchar(), getche(), putchar(), Formatted Input/Output i.e. printf() and scanf(), Library Functions – Concepts, Mathematical and Character Functions, Control Structures - if Statement, if.....else Statement, Nesting of ifelse statement, else if ladder, ? : Operator, switch Statement, Compound Statement Loop Controls – for, while, do-while Loops, break, continue, exit, goto Statement.	8	6				14	
UNIT-II The Need of a Function, User Defined and Library Function, Prototype of a Function, Calling of a Function, Function Argument, Passing Arguments to Function, Return Values, Nesting of Function, main(), Command Line Argument, Recursion.	8	6				14	
UNIT-III Arrays - Single and Multidimensional Arrays, Array Declaration and Initialization of Arrays, Array as Function Arguments, String : Declaration, Initialization, String Functions, Structure - Defining Structure, Declaration of Structure Variable, Accessing Structure Members, Nested Structures, Array of Structures, Structure Assignment, Structure as Function Argument, Function That Return Structure, Union.	8	6				14	
UNIT-IV Pointers- The & and * Operators, Pointers Expressions, Pointers v/s Arrays, Pointer to Functions, Static and Dynamic Memory Allocation in C, DMA Functions: malloc(), calloc(), sizeof(), free(), realloc().	8	6				14	
UNIT-V File Management - Defining, Opening a File & Closing a File, Text File, Binary File, Functions for File Handling: fopen, fclose,getc, fgetc, putc, fputc, getw, putw, gets, puts, fgets, fputs, fprintf, fscanf, fread, fwrite, Random Access to Files : fseek, ftell, rewind, File Name as Command Line Argument.	8	6				14	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • PROGRAMMING IN C BY E. BALAGURUSWAMI, TMH PUBLICATIONS • PROGRAMMING WITH C BY GOTTFRIED, SCHAUMS OUTLIE SERIES, TMH PUBLICATIONS • THINKING IN C BY MAHAPATRA, PHI PUBLICATIONS • GRAPHICS PROGRAMMING IN C BY STEVENS, BPB PUBLICATION • PROGRAMMING IN C BY R SUBBURAJ, VIKAS PUBLISHING 							

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I MS Windows: Introduction to MS Windows; Features of Windows; Various versions of Windows & its use; Working with Windows; My Computer & Recycle bin ; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel-setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer.	8	6				14	
UNIT-II Office Packages: Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS-Office, Lotus-Office, Star-Office, Open-Office etc. MS Word Basics: Introduction to MS Office, Introduction to MS Word, Features & area of use. Working with MS Word, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Working with -Styles, Text Attributes, Paragraph and Page Formatting, Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options	8	6				14	
UNIT-III Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers, Inserting - Page Numbers, Pictures, Files, Autotexts, Symbols etc., Working with Columns, Tabs & Indents, Creation & Working with Tables including conversion to and from text, Margins & Space management in Document, Adding References and Graphics, Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.	8	6				14	
UNIT - IV MS Excel: Introduction and area of use, Working with MS Excel, concepts of Workbook & Worksheets, Using Wizards, Various Data Types, Using different features with Data, Cell and Texts, Inserting, Removing & Resizing of Columns & Rows, Working with Data & Ranges, Different Views of Worksheets, Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text; Use of Formulas, Calculations & Functions, Cell Formatting including Borders & Shading, Working with Different Chart Types; Printing of Workbook & Worksheets with various options.	8	6				14	
UNIT-V MS PowerPoint: Introduction & area of use, Working with MS PowerPoint, Creating a New Presentation, Working with Presentation, Using Wizards; Slides & its different views, Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists, Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects, Designing & Presentation of a Slide Show, Printing Presentations, Notes, Handouts with print options. Outlook Express: Features and uses, Configuration and using Outlook Express for accessing e-mails in office.	8	6				14	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>WINDOWS XP COMPLETE REFERENCE. BPB PUBLICATIONS</i> • <i>MS OFFICE XP COMPLETE BPB PUBLICATION</i> • <i>MS WINDOWS XP HOME EDITION COMPLETE, BPB PUBLICATION.</i> • <i>JOE HABRAKEN, MICROSOFT OFFICE 2000, 8 IN 1, BY, PRENTICE HALL OF INDIA</i> • <i>I.T .TOOLS AND APPLICATIONS, BY A. MANSOOR, PRAGYA PUBLICATIONS, MATURA</i> 							

Course: - MSC(CS)
 Sub Code: 1MSC(CS)5

Semester: I
 Subject Name- Communicative English

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT-I Sentences: Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory. Clauses : Coordinate, Sub-ordinate, Relative, Adverb, Comparative (Adverb + Adjective) Articles: Usage of `A', 'AN', 'THE' Preposition: Position of Prepositions, Place Relations Time Relations and other relations.	8					8	
UNIT-II Tenses : Simple Present, Progressive Perfect, Present Perfect Progressive along-with Past Tense and indications of futurity. Reported speech Modals (Will, Shall Should, Would and others) Voice : Active and Passive.	8					8	
UNIT-III Comprehension of unseen passage, short answer type questions to test Understanding of the passage.	8					8	
UNIT-IV Paragraph writing based on expansion of given ideas Note taking /Note making	8					8	
UNIT-V Vocabulary: making sentences with idioms & phrases, corrections of sentences with words likely to be confused/Commonly Miss-spelled. Word formation like prefix / suffix	8					8	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>WRITTEN COMMUNICATION IN ENGLISH BY SARAH FREEMAN PUBLISHED BY ORIENT LONGMAN</i> • <i>A PRACTICAL ENGLISH GRAMMER BY THOMSON AND MARTINET.</i> • <i>ENGLISH GRAMMER BY W.S. ALLEN.</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT-I Introduction to Data Structures, Abstract Data Types Stacks - Introduction to Stack & Primitive Operation on Stack, Stack's Applications - Infix, Postfix & Prefix Expressions, Recursion, Multiple Stacks Queues -Introduction to Queues, Primitive Operations on Queues, Circular Queue, Dequeue, Priority Queue.	8					8	
UNIT-II Linked List - Introduction to Linked List, Memory Representation of Linked List, Operations on Linked List, Linked List Representation of Stack and Queue, Header Nodes. Types of Linked List - Doubly Linked List, Circular Linked List, Application of Linked List.	8					8	
UNIT-III Trees - Basic Terminology of Trees, Binary Trees, Tree Representations as Array & Linked List. Binary Tree Representation. Traversal of Binary trees - Inorder, Preorder & Postorder, Application of Binary Tree, Threaded Binary Tree, Balanced tree, AVL tree, B-tree	8					8	
UNIT-IV Analysis of Algorithm, Complexity with Big'O' Notation. Searching - Sequential Search, Binary Search and their Comparison. Sorting - External & Internal Sorting, Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Comparison of Sorting Methods. Hashing, Collision Resolution Techniques.	8					8	
UNIT-V Graphs - Introduction to Graphs, Basic Terminology, Directed, Undirected & Weighted Graph, Representation of Graphs, Warshall's Algorithm for Path Matrix, Graph Traversals - Depth First & Breadth First Search. Spanning Trees, Minimum Spanning Tree, The Basic Greedy Strategy for Computing, Algorithm of Kruskal and Prim. Applications of Graphs : Shortest Path Problem using Dijkstra Method.	8					8	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>FUNDAMENTALS OF DATA STRUCTURE, BY S. SAWHNEV & E. HOROWITZ</i> • <i>DATA STRUCTURE: BY TREMBLEY & SORRENSON</i> • <i>DATA STRUCTURE: BY LIPSCHUISTS (SCHAUM 'S OUTLINE SERIES MCGRAW HILL PUBLICATION)</i> • <i>FUNDAMENTALS OF COMPUTER ALGORITHM: BY ELLIS HOROWITZ AND SARTAJ SAWHNEY</i> 							

Course: - MSC(CS)
 Sub Code: 2MSC(CS)2

Semester: II
 Subject Name- Digital Electronics and Computer
 Organization

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT-I Introduction to Organization and Architecture: Computer Components, Computer Function, Interconnection Structures, Bus Interconnection, PCI. Input/ Output - External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels and Processors, The External Interface. Integer Representation, Integer Arithmetic, Floating Point Representation, Floating-Point Arithmetic.	8					8	
UNIT-II Computer memory organization - Computer Memory System Overview, Semiconductor Main Memory, Advanced DRAM Organization. Cache Memory, Hit ratio, Mapping techniques, Writing into cache, Magnetic Disk, RAID, Optical Memory, Magnetic Tape. Auxiliary Memory, Memory Hierarchy, Associative Memory, Virtual Memory, Address Space & Memory Space, Address Mapping, Page Table, Page Replacement, Segmentation.	8					8	
UNIT-III Computer Instructions - The Arithmetic and Logic Unit (ALU), Instruction sets - Machine Instruction Characteristics, Types of Operands, Types of Operations, Assembly Language. Addressing Modes and Formats, Addressing, Instruction Formats.	8					8	
UNIT-IV CPU structure and function: Processor Organization, Register Organization, The Instruction Cycle, Instruction Pipelining, The Pentium Processor.	8					8	
UNIT-V Control Unit Operation - Micro - Operations, Control of the CPU, Hardwired Implementation. Basic Concepts of Micro programmed Control.	8					8	
TEXT & REFERENCE BOOKS : <ul style="list-style-type: none"> • <i>COMPUTER ORGANIZATION AND ARCHITECTURE BY WILLIAM STALLINGS TMH PUBLICATION</i> • <i>COMPUTER SYSTEM ARCHITECTURE: BY M. MORRIS MANO</i> • <i>DIGITAL LOGIC AND COMPUTER DESIGN BY M. MORRIS MANO</i> 							

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies: types of assemblies, class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Project Explorer, Toolbox, Properties Window, form designer, form layout, immediate window. Event driven Programming - Methods and events related with mouse and keyboard.	8	6				14	
UNIT-II The VB.NET Language- Console Programming, Declaring variables, Data Types, Scope & lifetime of a variable, Arrays, types of array, control array Subroutine, Functions, Passing argument to functions, Optional Argument, Returning value from function. Control flow statements: Decisions and Conditional statement, Loop statement. Exceptions Working with Forms: Creating Forms, Building User Interface Web Forms, Loading, showing and hiding forms, working with multiple forms, controlling One form within another.	8	6				14	
UNIT – III GUI Programing with windows form: VB.Net Controls, Text box control, label control, button control, Listbox, Combo box, checked box, Picture box, Radio button, Pannel, scroll bar, Timer control , there Properties, Methods and events, adding controls at runtime. Dialog Boxes - Common dialog control: File, save, Print, Help. Designing menus : Creating Menu and Menu Items, access & shorcut keys. MDI forms : Properties of Parent & child form, working with parent and child menus.	8	6				14	
UNIT-IV Object oriented Programming: Classes & Namespaces, objects, data members, Properties, Methods, raising and handling Events, constructors. Inheritance, Access Specifies: Public Private, Protected, overloading, overriding, Creating Interfaces, multiple interfaces, My Base & My Class keywords. Concept of OLE, The COM technology, Advantages of COM+, COM & .NET, Create User control, register user control, access com component in .net application. Deployment of .NET application.	8	6				14	
UNIT-V Accessing Database with ADO.NET (visually): Create connection with sever explorer, Creating data connection using data Connection, Command, Adapter, Dataset and DataReader controls. Data binding with data grid and basic controls. The Data Form wizard. Accessing Database using ADO.NET Object model (through code): create Connection object, Command object, DataAdapter object, DataSet object. Add, delete, move & update records to dataset. Executing SQL query, operation on data rows and columns.	8	6				14	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>VB.NET PROGRAMMING BLACK BOOK BY STEVEN HOLZNER –DREAMTECH PUBLICATIONS</i> • <i>MASTERING VB.NET BY EVANGELOS PETROUTSOS- BPB PUBLICATIONS</i> • <i>INTRODUCTION TO .NET FRAMEWORK-WORX PUBLICATION</i> • <i>MSDN.MICROSOFT.COM/NET/</i> • <i>WWW.GOTDOTNET.COM</i> 							

Course: - MSC(CS)
Sub Code: 2MSC(CS)4

Semester: II
Subject Name- Object Oriented Programming with C++

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I Overview of C++ : Object oriented programming, Concepts, Advantages, Usage. C++ Environment: Program development environment, the language and the C++ language standards. Introduction to various C++ compilers, C++ standard libraries, Prototype of main() function, Data types. C++ as a superset of C, New style comments, main function in C++, meaning of empty argument list, function prototyping, default arguments and argument matching. User defined data types: enumerated types, use of tag names, anonymous unions, scope of tag names Classes & Objects : Classes, Structure & Classes, Union & Classes, Inline Function, Scope Resolution operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment. Friend Function, Friend Classes.	8	6				14	
UNIT-II Array, Pointers References & The Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, The This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, call by reference and return by reference Passing References to Objects, Returning Reference, Independent Reference, C++'S Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects. Constructor & Destructor : Introduction, Constructor, access specifiers for constructors, and instantiation, Parameterized Constructor, Multiple Constructor in A Class, Constructor with Default Argument, Copy Constructor, Destructor.	8	6				14	
UNIT-III Overloading as polymorphism: Function & Operator Overloading : Function Overloading, Overloading Constructor Function Finding the Address of an Overloaded Function, Operator Overloading: Creating A Member Operator Function, Creating Prefix & Postfix Forms of the Increment & Decrement Operation, Overloading The Shorthand Operation (I.E. +=, -= Etc), Operator Overloading Restrictions, Operator Overloading Using Friend Function, Overloading New & Delete, Overloading Some Special Operators, Overloading [], (), -, Comma Operator, Overloading << And . Namespaces: global namespace and namespace std, nested namespaces.	8	6				14	
UNIT-IV Inheritance : Base Class Access Control, C, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes. Virtual Functions & Polymorphism : Virtual Function, Pure Virtual Functions, Early Vs. Late Binding.	8	6				14	
UNIT-V Exception Handling, Exception handling in C++, try, throw, catch sequence, multiple catch blocks, uncaught exceptions, catch-all exception handler, The C++ I/O System Basics : C++ Streams, The Basic Stream Classes C++ Predefined Streams, Formatted I/O: Formatting Using The Ios Members, Setting The Formal Flags, Clearing Format Flags, An Overloaded Form Of Setf (), Using Width() Precision() and Fill(), Using Manipulators to Format I/O, Creating Your own Manipulators.	8	6				14	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • HERBERT SCHILDT, "C++ THE COMPLETE REFERENCE " - TMH PUBLICATION ISBN 0-07-463880-7 • E. BALGURUSWAMY, "C++ ", TMH PUBLICATION ISBN 0-07-462038-X • M KUMAR "PROGRAMMING IN C++", TMH PUBLICATIONS 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT-I Management practices- Meaning and Functions, Development of Management Thought, F. W. Taylor And Herry Fayol's Theories of Management, Qualities of an Efficient Management, Management Principles Of Modern Times (Empowerment, Kaizen, Quality Circles, Total Quality Management.	8					8	
UNIT-II Planning -Plan, policies, strategies and programs, steps in planning & decision making, forecasting , qualities of an effective planner, relevant case study	8					8	
UNIT-III Organizing-Organizational Design, Organizational Structure, Centralization & Decentralization, Delegation, Gantt chart and PERT/CPM, Relevant Case Study	8					8	
UNIT-IV Directing-Motivation and team building, theories of motivation, factors affecting motivation. Leadership, leadership styles, theories of leadership, qualities of a effective leader, effective communication and presentation skills, relevant case studies.	8					8	
UNIT-V Controlling Meaning and basic principles, types of controls, budget and budgetary control, inventory control and quality control, relevant case studies.	8					8	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>ESSENTIALS OF MANAGEMENT BY H. KOONZ & H. WEIHRICH TMH PUBLICATION,</i> • <i>PRINCIPLES OF MANAGEMENT BY O.P. KHANNA</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT-I Use of communication and IT , Communication Mode- Simplex, Half Duplex, Full Duplex, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Types of Network - LAN, WAN, MAN ,Internet etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, World Wide Web Internet Services, Analog & Digital Signal.	8					8	
UNIT-II Base Band , Broad Band, Multiplexer FDM, TDM, Modulation AM, FM, PM, Transmission Media ,Modem. OSI Reference Model , Switching Technique, Message Switching, Circuit Switching, Packet Switching, Virtual Circuit, , IEEE Standards, 802.3, 802.4, 802.5.	8					8	
UNIT-III Fast Ethernet, FDDI Token Ring, Wireless LAN, Inter-Networking Devices, Bridge, Routers Gateways, Repeater, Routing Algorithms, Distance Vector Routing, Shortest Path Routing, Broadcast Routing, Multicast Routing, TCP/IP Protocol, IPV4 Addressing, Congestion Control, Traffic Shaping.	8					8	
UNIT-IV Comparison Between OSI and TCP/IP Models, TELNET, FTP, SMTP, MINE, UDP, URL (Uniform Resource Locater) HTTP , ISDN Channel, ISDN Services, Base Band ISDN, Broadband ISDN.	8					8	
UNIT-V Network Security : Network Security Issues, Firewalls – Need and Features of Firewalls, Types of Firewall Technology- Network Level and Application Level, IP Packets Filter Screening Routers, Limitations of Firewalls.	8					8	
TEXT & REFERENCE BOOKS : <ul style="list-style-type: none"> • <i>COMPUTER NETWORKING BY ANDREWS TANANBAUM</i> • <i>UNDERSTANDING DATA COMMUNICATION OF NETWORKING BY WILLIAM A SHAY</i> • <i>COMMUNICATION AND NETWORK BY LEWIS MACHENZIE</i> • <i>DATA COMMUNICATION BY PRAKASH C GPTA</i> • <i>DATA AND COMPUTER COMMUNICATION: BY WILLIAM STALLINGS</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total	Remarks
UNIT-I Database system Applications, Purpose of database System, View of data, Database Languages, Database Architecture, Structure of Relational database, Database Schema, Keys, Relational Operations.	8					8	
UNIT-II Database Design Process, The ER Model, Constraints, Details of ER Diagram, ER Design issues, Extended ER Features, The relational Algebra.	8					8	
UNIT-III Relational database Design Features, First Normal Form, Functional dependency Theory, Decomposition Using Functional Dependency, 2NF, 3NF, BCNF, Join and Multivalve dependency, 4NF and 5 NF, Basic structure of SQL queries, Working with Tables, Data type in SQL, Data Constraints	8					8	
UNIT-IV Select Command, Oracle Operator, Range Searching, Pattern Matching, Joins expression, SQL Built in Function Grouping data from Tables in SQL, Manipulation Data in SQL, Joining Multiple Tables, Sub queries, working with User, Working With View.	8					8	
UNIT-V PL/SQL, SQL & PL/SQL, Differences, Blocking Code for Clarity, Using Variables, Constant and Data Types, Assigning Data Base Values to Variables, Cursor, Using Flow Control and Loop Statements, Go To Statement, Exception handling in PL/SQL, Stored Packages, Procedures, and Functions in PL/SQL, Trigger Usage and Application.	8					8	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>AN INTRODUCTION TO DATABASE SYSTEM (3RD ED.) BY C.J. DATE</i> • <i>DATABASE SYSTEM CONCEPTS BY HENRY F. KORTH</i> • <i>DATABASE MANAGEMENT SYSTEMS BY LEON & LEON, VIKAS PUBLICATIONS.</i> • <i>AN INTRODUCTION T O DATABASE SYSTEM BY BIPIN C. DESAI</i> • <i>FUNDAMENTALS OF DATABASE SYSTEM (2ND ED.) BY ELEMESRI AND S. NAVATHE</i> • <i>ORACLE A BEGINNERS GUIDE BY MICHAEL ABBEY & MICHAEL J. COREY TMH PUBLICATIONS</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total	Remarks
UNIT - I Software : Software Characteristics and Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & RAD Model, Incremental Model and Spiral Model. Project Metrics : Software Measurement–Size Oriented, Function Oriented Metrics, Extended Function Point Metrics.	8					8	
UNIT - II Software Project Planning: Objectives, Decomposition Techniques, and Empirical Estimation Models. Analysis Concept and Principles: Requirement Analysis, Analysis Principles.	8					8	
UNIT – III Design Concepts and Principles: Design Process, Design Concepts, Design Principles, Effective Modular Design, Human Computer Interface Design, Interface Design Guidelines.	8					8	
UNIT - IV S/W Quality Assurance : Quality Concepts, Reliability S/W Testing Models : S/W Testing Fundamentals, White and Black Box Testing, Basic Path Testing, Testing Strategies : Strategic Approach to S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing,	8					8	
UNIT - V S/W Reuse : Reuse Process, Classification and Retrieving Components, Economics of S/W Reuse ,CASE : Introducing to CASE, Taxonomy of Case Tools,	8					8	
TEXT & REFERENCE BOOKS : <ul style="list-style-type: none"> • <i>SOFTWARE ENGINEERING BY R.S.PRESSMAN</i> • <i>AN INTEGRATED APPROACH TO SOFTWARE ENGINEERING BY PANKAJ JALOTE</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT I HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of front size & Attributes. List types and its tags, Use of Frames and Forms in web pages, ASP & HTML Forms.	8	6				14	
UNIT II Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program, Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization and Persistence, Serializing an Object, Deserializing an Object. Delegates and Reflection.	8	6				14	
UNIT III Overview of Dynamic Web page, introduction & features of ASP.NET, Understanding ASP.NET Controls, Applications, Web servers, installation of IIS, Web forms, web form controls -server controls, client controls, Adding controls to a web form, Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project, Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.	8	6				14	
UNIT IV Overview of ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data Adapters and Datasets , using Command & Data Reader, binding data to data bind Controls, displaying data in data grid, XML in .NET , XML basics, attributes, fundamental XML classes: Document, textwriter, textreader. XML validations, XML in ADO.NET, The XMLData Documents.	8	6				14	
UNIT-V Web services: Introduction, State management- View state, Session state, Application state, SOAP, web service description language, building & consuming a web service, Web Application deployment. Caching, Threading Concepts, Creating Threads in .NET, managing threads, Thread Synchronization, Security features of .NET, Role based security & Code access security, permissions,	8	6				14	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>ASP.NET 3.5 BLACK BOOK (COVERS C# AND VB 2008 CODES) - DREAMTECH PUBLICATION</i> • <i>THE COMPLETE REFERENCE ASP.NET BY MATHEW MACDONALD - TMH</i> • <i>PROFESSIONAL ASP.NET- WROX PUBLICATION</i> • <i>INTRODUCTION TO .NET FRAMEWORK-WORX PUBLICATION</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total	Remarks
UNIT-I History and design features of JAVA, how java works, basics of JAVA, Applications and Applets, using the tools in JDK, javadoc, java, jdb etc. Applet Programming - Creating and executing Java applets, inserting applets in a web page, Java security. JAVA Language- Keywords, Constants, Variables, and Data Types. Operators and Expressions, Decision making, Branching and Looping, Labeled Loops Statement, Jump statements: Break, Continue, and Return. Arrays and Strings- Creating an Arrays, one and two Dimension Arrays, String Array, String and String Buffer Classes.	8	6				14	
UNIT-II Classes, Objects and Methods Defining a class, adding variables and Methods, creating objects constructors, Wrapper Classes. Inheritance, Basics types, using super, multi level hierarchy, abstract and final classes, object class, packages and interfaces, Access protection, Extending interfaces, packages.	8	6				14	
UNIT-III Exception Handling, Fundamentals exception types, uncaught exceptions, throws, throw, try -catch, final, built in exceptions, creating your own exceptions. Multithreading Fundamentals, Java Thread model : priorities, synchronization, messaging, thread class, Runnable interface, Interthread communication, suspending, resuming and stopping threads.	8	6				14	
UNIT-IV Input/Output -Basics, Streams, Byte and Character streams, predefined streams, reading and writing from console and files .Using standard Java Packages (lang,util,io) Networking -Basics, networking classes and interfaces, using java.net package, doing TCP/IP and Datagram programming.	8	6				14	
UNIT-V AWT Classes, Event Handling and Swing classes, AWT Programming, Working with windows, Graphics and Text, using AWT controls, Layout managers and menus, Handling image, animation, sound and video. Event Handling-Different mechanism, the Delegation Event Model, Event Classes, Event Listener interfaces, Adapter and Inner Classes. Java Swing -Japplet, Icons and Labels, Text fields, Buttons, Combo Boxes, Tabbed and Scroll Panes, Trees, Tables.	8	6				14	
TEXT & REFERENCE BOOKS : <ul style="list-style-type: none"> • <i>JAVA THE COMPLETE REFERENCE BY PATRICK NAUGHTON AND HERBERT SCHILDT. TMH PUBLICATION ISBN 0-07-463769-X</i> • <i>PROGRAMMING WITH JAVA BY E. BALAGURUSWAMY TMH PUBLICATIONS ISBN 0-07-463542-5</i> • <i>USING JAVA 1.2 BY JOSEPH WEBER. PHI – ISBN-81-203-1558-8</i> 							

Unit	Lectures	Practical's	Workshop	Demo	Field Visits	Total Hours	Remarks
UNIT – I Linux introduction and file system - Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process.	8	6				14	
UNIT-II Essential linux commands Understanding shells, Processes in linux - process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi & vim editor.	8	6				14	
UNIT-III System administration: Common administrative tasks, configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages with rpm command. KDE & Gnome graphical interfaces.	8	6				14	
UNIT-IV Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.	8	6				14	
UNIT-V Basic networking administration: Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to Internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services, routing using Linux Installation & Administration of mail server, ftp server and Apache web server.	8	6				14	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>UNIX - CONCEPTS & APPLICATIONS (THIRD ED.) - SUMITABHA DAS, T ATA MCGRAW HILL PUBLICATIONS.</i> • <i>UNIX FOR PROGRAMMERS AND USERS (THIRD ED.) - GRAHAM GLASS & KING ABLES, PEARSON EDUCATION INDIA.(LOW PRICES EDITION).</i> • <i>FEDORA CORE 6 BIBLE</i> • <i>RED HAT LINUX 9 BIBLE – CRISTOPHER NEGUS, IDG BOOKS INDIA LTD.</i> • <i>USING LINUX BY JACK T ACKETT, DAVID GUNTER, PHI, EEE EDITION</i> • <i>LINUX INSTALLATION AND ADMINISTRATION, NICHOLAS WELLS, COURSE TECHNOLOGY (VIKAS PUBLISHING, NEW DELHI).</i> • <i>UNIX SHELL PROGRAMMING - YASHWANT KANETKAR, BPB PUBLICATIONS,</i> • <i>RED HAT LINUX UNLEASHED T ECHMEDIA (BPB PUBLICATIONS)</i> • <i>LINUX NETWORKING AND SECURITY - WELLS, COURSE T ECHNOLOGY (VIKAS PUBLISHING, NEW DEIHI</i> 							

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT I Introduction & Requirements - Introduction to HTML , Java Server Pages – Basics – JSP Constructs – Scripting elements - directives - actions – beans – tags Introduction to apache tomcat server (installation & configuration)-start/stop tomcat services – run JSP page on Tomcat	8	6				14	
UNIT II JSP implicit objects, Handling Request Parameters – Form Handling (text fields / text area) – Handling multiple buttons/check boxes/radios/combo - Session Management – URL Rewriting - Hidden fields – cookies	8	6				14	
UNIT III Introduction to Servlet- Servlet Life Cycle – ServletRequest & ServletResponse – Writing Servlets – Requirements & Configuration ServletRequest & ServletResponse Methods & use – sending different types of data	8	6				14	
UNIT IV Introduction to MySQL –features, installation & configuration, creating & managing database, MySQL Driver Java Database Connectivity (JDBC) with MySql –loading MySql driver – creating connection – Statement – ResultSet	8	6				14	
UNIT V Java Naming Directory Interfaces – JMS – Introduction – Topic – example of Topic & Queue – EJB – Basics – stateless / client creation – statefull client creation – Container Managed Persistence – Bean Managed Persistence	8	6				14	
TEXTS & REFERENCE BOOKS : <ul style="list-style-type: none"> • <i>JAVA THE COMPLETE REFERENCE BY PATRICK NAUGHTON AND HERBERT SCHILDT. TMH PUBLICATION ISBN 0-07-463769-X</i> • <i>PROGRAMMING WITH JAVA BY E. BALAGURUSWAMY TMH PUBLICATIONS ISBN 0-07-463542-5</i> • <i>USING JAVA 1.2 BY JOSEPH WEBER. PHI – ISBN-81-203-1558-8</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT-I Data ware housing Definition, usage and trends, DBMS vs. data warehouse, Data marts, Metadata Data mining definition & application, DBMS vs. data mining, KDD versus data mining, data mining techniques, Data Preprocessing: need, data cleaning, integration & Transformation	8					8	
UNIT-II Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations, Data warehouse process & architecture, OLTP vs. OLAP, types of OLAP, ROLAP vs. MOLAP, 3 – Tier data warehouse architecture,	8					8	
UNIT-III Association Rule Mining, Single-Dimensional Boolean Association Rules Apoiri algorithm, FP growth, Multi-Level Association Rules from Transaction Databases	8					8	
UNIT-IV Classification and Prediction, Concepts of Decision Tree Induction and Bayesian Classification Cluster Analysis, Categorization of methods, Partitioning methods, K-Means algorithm, Outlier Analysis, Hierarchical methods.	8					8	
UNIT-V Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, Web Mining concepts	8					8	
TEXT & REFERENCE BOOK:							
<ul style="list-style-type: none"> • DATA MINING – CONCEPTS & TECHNIQUES; JIAWEI HAN & MICHELINE KAMBER – ELSEVIER • DATA WAREHOUSING FUNDAMENTALS; PAULRAJ PONNIAH, WILEY • DATA MINING TECHNIQUES; ARUN PUJAR; 2001, UNIVERSITY PRESS; HYDERBAD. • INTRODUCTION TO DATA MINING WITH CASE STUDIES; G.K. GUPTA, PHI 							

Unit	Lectures	Practical's	Workshop	Demo	Field	Total	Remarks
UNIT-I Testing Basics And Development Models: Principals and Context of Testing In Software Production, Software Quality Control and its Relation With Testing, Validating And Verification, White Box Testing: White Box Testing - Static Testing, Structural Testing-Unit ,Code, Functional Testing, Code and Complexity Testing,.	8					8	
UNIT -II Black Box Testing- Positive and Negative Testing, Boundary Value Testing, Equivalence Partitioning, User Documentation Testing, Integration Testing: Introduction and types of Integration Testing, Scenario Testing, System and Acceptance Testing- Acceptance Testing.	8					8	
UNIT -III Performance Testing- Introduction, Factors Related too Performance Testing, Methodology For Performing Testing, Regression Testing, Overview Testing Tools: Win runner, Load runner, Test Director.	8					8	
UNIT -IV Software Project Management: Overview, Software Project Management Framework, Problems in Software Projects. Scope Management, Communication Techniques and Tools. Requirement Specifications, Resources types for a Software Projects.	8					8	
UNIT -V Software Project Estimation: Work Breakdown Structure (WBS), Steps in WBS, Measuring Efforts for a Project, Project Scheduling: Scheduling and its Need, Scheduling Basics, Gant Chart,	8					8	
TEXT & REFERENCE BOOKS: <ul style="list-style-type: none"> • <i>SOFTWARE TESTING: PRINCIPLES AND PRACTICE BY GOPALASWAMY AND SRINIUSAN, 81775812 LX. PUBLISHER, PEARSON EDUCATION INDIA. ISBN, 81775812 LX.</i> • <i>SOFTWARE TESTING T OOLS : COVERING WINRUNNER, SILK T EST, LOADRUNNER, JMETER AND T ESTDIRECTOR WITH CASE BY DR. K. V.K.K. PRASAD, ISBN: 8177225324, WILEY DREAMTECH,</i> • <i>HTTP://WWW.COLUMBIA.EDU/-JM221 7/</i> • <i>BASICS OF SOFTWARE PROJECT MANAGEMENT BY NIIT ,, PRENTICEHALL OFLNDIA,ISBN 81-203-2490-0</i> • <i>SOFTWARE PROJECT MANAGEMENT BY BOB HUGHES & MIKE COTTERELL, T ATA MCGRAW HILL, ISBN 0-07-061 985-9</i> 							

Unit	Lectures	Practical's	Workshops	Demo	Field Visits	Total Hours	Remarks
UNIT I Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms.	8					8	
UNIT II Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, Secure Hash Functions .	8					8	
UNIT III Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.	8					8	
UNIT IV Email privacy: - E-Mail Security, IP security, Web security. Overview, IP Security Architecture, Combining Security Associations and Key Management.	8					8	
UNIT V Introduction of Cyber Crime, Categorizing cyber crime, perception of cyber criminals: hackers, insurgents and extremist groups, Information Warfare- concept, information as an intelligence weapon, attacks and retaliation, attack and defense. Cyber Law	8					8	
TEXT & REFERENCE BOOKS:							
<ul style="list-style-type: none"> • NETWORK SECURITY, KAUFMAN, PEARLMAN AND SPECINER, PEARSON EDUCATION. • INFORMATION WARFARE : CORPORATE ATTACK AND DEFENSE IN DIGITAL WORLD, WILLIAM HUTCHINSON, MATHEW WARREN, ELSEVIER. • NETWORK SECURITY ESSENTIALS (APPLICATIONS AND STANDARDS) BY WILLIAM STALLINGS PEARSON EDUCATION.) • FUNDAMENTALS OF NETWORK SECURITY BY ERIC MAIWALD (DREAMTECH PRESS) • CRYPTOGRAPHY AND NETWORK SECURITY, THIRD EDITION, STALLINGS, PHI/PEARSON • PRINCIPLES OF INFORMATION SECURITY, WHITMAN, THOMSON • NETWORK SECURITY: THE COMPLETE REFERENCE, ROBERT BRAGG, MARK RHODES, TMH • INTRODUCTION TO CRYPTOGRAPHY, BUCHMANN, SPRINGER. 							

INTERNAL EVALUATION

For internal evaluation wherever required as per scheme, the concerned faculty members must keep a detailed record of activities performed. At least 2 tests must be conducted evenly distributed in the semester and syllabus, each having a weightage of 25% (in case more than 2 tests conducted, best 2 performance may be considered). Further the entire semester attendance be evaluated for 25% weightage and fully a comprehensive subject viva on the assignments (at least two) shall have a weightage of 25%.

The record for every students must be maintained at least for 6 months after the end of examination, foil/counter foil must be submitted to the Examination Section before the start of theory examination. The format (for 20 marks weightage) is attached herewith.

1. Subject code
2. Subject name
3. Year
4. Study Institute code
5. Name & address of Study Institute
6. Name of Class Coordinator

Roll No.	Enrollment No.	Test-1 Marks MM-5	Test-2 Marks MM-5	Attendance MM-5	Viva MM-5	Total MM-20

Signature of Class Coordinator

Signature of Head of Institute