KAKATIYA UNIVERSITY
WARANGAL-506009

M.Sc. (Computer Science) Syllabus

Under the

CHOICE BASED CREDIT SYSTEM
(With effect from 2016-17)

DEPARTMENT OF COMPUTER SCIENCE

University College, KU, Warangal-506009

M.SC. I YEAR I SEMESTER:

Paper No	Paper Title/Subject	Workload Per Week (L+T+P)	Marks			CREDITS
			Internal	External	Total	
MSCCS111	DISCRETE MATHEMATICS	4+0+0	20	80	100	4
MSCCS112	COMPUTER ORGANIZATION	4+0+0	20	80	100	4
MSCCS113	OOPS WITH JAVA	4+0+0	20	80	100	4
MSCCS114	OPERATING SYSTEMS	4+0+0	20	80	100	4
MSCCS115	COMPUTER NETWORKS	4+0+0	20	80	100	4
MSCCS116	OOPS LABORATORY	0+0+4	--	50	50	2
MSCCS117	COMPUTER NETWORK S LABORATORY	0+0+4	--	50	50	2
MSCCS118	OPERATING SYSTEM LABORATORY	0+0+4	--	50	50	2
	SEMINAR	02	25		25	1
					675	27

L:Lecture T:Tutorial   P:Practical

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MSCCS111	DISCRETE MATHEMATICS		DM
WORK LOAD: 4 PPW	INTERNAL MARKS: 20		EXTERNAL MARKS: 80

U N I T - I

FUNDAMENTALS: Sets, Relations and functions, Fundamental of logic, Logical inferences, First order logic, Quantified propositions, Mathematical induction

ELEMENTARY COMBINATORICS: Combinations and Permutations, Enumeration-with Repetitions, with constrained repetitions, The Principle of Inclusion-Exclusion.(Chapters 1-2)

U N I T -II

RECURRENCE RELATIONS: Generating functions, Coefficients of Generating functions, Recurrence Relations, Inhomogeneous Recurrence Relations (Chapter-3)

U N I T - III

RELATIONS AND DIAGRAMS: Relations and diagrams, Binary relations, Equivalence relations, Ordering relations, Lattices, Paths and Closures, Directed graphs, Adjacency matrices-Applications, Sorting and Searching (Chapter - 4)

U N I T - IV

GRAPHS: Graphs, Isomorphism, Trees, Spanning trees, Binary trees, Planar graphs, Euler'sCircuits, Hamiltonian graphs, Chromatic numbers, Four-color problem, Network flows (Chapter 5)

TEXT-BOOK:

1. DISCRETE MATHEMATICS FOR COMPUTER SCIENTISTS, BY - J L MOTT, A KANDEL AND T PBAKER

REFERENCE BOOKS:

1. DISCRETE MATHEMATICAL STRUCTURE - (TMH) BY - TREMBLEY AND MANOHAR
2. DISCRETE MATHEMATICS WITH ALGORITHMS - (JOHN WILEY) BY - M.O. ALBERTSON AND J.P.HUTCHINSON
3. ELEMENTS OF DISCRETE MATHEMATICS-(TMH, SECOND EDITION) BY - C.L.LIU
4. DISCRETE MATHEMATICS - (PHI, THIRD EDITION) BY - BURNORD KOLMAN
5. DISCRETE MATHEMATICS BY KH ROSSEN (TMH)
6. DISCRETE MATHEMATICS BY S LIPSCHUTZ AND M. LIPSON SCHAUM'S SERIES (TMH)
7. DISCRETE MATHEMATICS FOR COMPUTER SCIENCE BY GARRRY HAGGARD, J. SCHILPF AND S WHITE SIDES (THOMSON PRESS)
8. DISCRETE &COMBINATORIAL MATHEMATICS BY RALPH P GRIMALDI(PEARSON EDUCATION)
9. DISCRETE MATHEMATICAL STRUCTURES BY DS MALLIK & M K SEN (THOMSON PRESS)

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MSCCS112	COMPUTER ORGANIZATION	CO
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

U N I T - I

BASIC STRUCTURE OF COMPUTER HARDWARE AND SOFTWARE: Functional units, Basic operational concepts, Bus structures, Software, Performance, Distributed Computing.

LOGIC CIRCUITS: Basic Logic Functions, Synthesis of Logic Functions Using ADN, OR, and NOT Gates, Minimization of Logic Expression, Synthesis with NAND and NOR Gates, Practical Implementation of Logic Gates, Flip-Flops, Registers and Shift Registers, Counters, Decoders, Multiplexers, Sequential Circuits.   (Chapter 1, A.1 to A.13)

UN I T - II

ADDRESSING METHODS: Basic Concepts, Memory Locations, Main Memory Operations, Addressing Modes, Assembly Language, Basic I/O operations, Stacks and Queues, Subroutines.   PROCESSING UNIT: Some Fundamental Concepts, Execution of a Complete Instruction, Hardwired Control, Performance Considerations, Micro Programmed Control, Signed Addition and Subtraction, Arithmetic and Branching Conditions, Multiplication of Positive Numbers, Signed-Operand, Integer Division, Floating-Point Numbers.(Chapter 2.1 to 2.83, 6.4 to 6.10)

U N I T - III

INPUT-OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, I/O Hardware, Standard I/O Interfaces, The Motorola 680X0 Family, The Intel 80X86 Family, The Power PC Family, The Alpha AXP Family, Architectural and Performance Comparisons, A Stack Processor. (Chapter 4, 8.1 to 8.6)

U N I T - IV

MEMORY: Semiconductor RAM memories, Read-Only Memories, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements. INTRODUCTION TO COMPUTER PERIPHERALS: I/O Devices, On-Line Storage. (Chapter 5, 9.1, 9.2)

TEXT BOOK:
1. COMPUTER ORGANIZATION, TMH (IV EDITION) BY -   V.C. HAMACHER
REFERENCES:
 1.   COMPUTER ORGANIZATION, (PHI) BY - MORIS MANO
 2.   COMPUTER ARCHITECTURE & ORGANISATIONBY - HAYES, (TMH)
 3.   COMPUTER SYSTEMS ORGANISATION& ARCHITECTURE BY - CARPINELLI, (ADDISON WESLEY)
 4. THE ARCHITECTURE OF COMPUTER HANDWONE AND SYTEMS HANDWONE BY- ENGLANDER (WIELY).
 5. COMPUTER SYTEMS DESIGN AND ARCHITECTURE BY- VP HEURING, HF JORDAN (PEARSON).
 6. COMPUTER ORGANIZATION & ARCHITECTURES BY – STALLINGS (PEARSON, PHI).
 7. COMPUTER ORGANIZATION & DESIGN BY - PP CHAUDARI (PHI)

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MSCCS113	OOPS WITH JAVA		OOPS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**		**EXTERNAL MARKS: 80**

UNIT - I

Object - Oriented Thinking: Messages and Methods - Classes and Instances - Class Hierarchies -Inheritance - Method Binding, Overriding, and Exceptions. A Brief History of Object - Oriented Programming: The History of Java - Client - Side Computing - Java Language Description. Object - Oriented Design: RDD - CRC cards - Components and Behavior - Software Components-Formalizing the Interface – Implementing components Integration of Components. Understanding Paradigms: Program Structure - Types - Access Modifiers - Lifetime Modifiers. (Chapters1 to 4)

UNIT - II

Data Fields - Constructors - Inheritance - The Java Graphics Model - Multiple Objects of the Same Class. Adding User Interaction - Inner Classes - Interfaces - The Java Event Model - Window Layout. Understanding Inheritance: An Intuitive Description of Inheritance - Subclass, Subtype, and Substitutability - Forms of Inheritance - Modifiers and Inheritance - The Benefits of Inheritance -The Costs of Inheritance. Mechanisms for Software Reuse: Substitutability-Combining Inheritance and Composition - Dynamic Composition. (Chapters 5, 6, 8, 10)

UNIT - III

Implications of Inheritance: The Polymorphic Variable - Assignment - Equality Test - Garbage Collection. Polymorphism: Polymorphic Variables - Overloading - Overriding - Abstract methods - Pure Polymorphism. Input and Output Streams: Input Streams - Output Streams - Object serialization - Piped Input and Output - Readers and Writers. Exception Handling: Information Transmitted to the Catch Block - The Finally Clause - Throwing Exceptions - Passing on Exceptions. (Chapters 11, 12,14,16)

UNIT - IV

The AWT: The AWT Class Hierarchy - User Interface Components – Panels Dialogs. Understanding Graphics: Color - Rectangles - Fonts - Images. Multiple Threads of Execution: Creating Threads - synchronizing Threads. Collection Classes - Multiple Threads of Execution - Exception Handling. Applets and Web Programming: Applets and HTML - Security Issues - Applets and Applications -Obtaining Resources Using an Applet - Combining Applications and Applets. (Chapters 7, 13, 18, 20, 21)

TEXT BOOK:
1. UNDERSTANDING OBJECT-ORIENTED PROGRAMMING WITH JAVA BY – TIMOTHY BUDD (PEARSON)

REFERENCE BOOKS:
1. THE COMPLETE REFERENCE JAVA 2 (Fourth Edition) BY - PATRICK NAUGHTON & HERBETSCHILDT (TMH)
2. PROGRAMMING JAVA - DECKER&HIRSH FIELD VIKAS PUBLISKING(2001) (THOMSON LEARNING) (SECOND EDITON)
3. INTRODUCTION TO JAVA PROGRAMMING - Y.DANIEL LIANG PHI (2002)
4. OBJECT ORIENTED PROGRAMMING THROUGH JAVA 2 BY - THAMUS WU (Mc.GrawHill)
5. JAVA 2 - DIETEL & DIETEL (PEARSON EDUCATION)
6. INTRODUCTION TO JAVA - BALA GURU SWAMY
7. INTRODUCTION TO PROGRAMMIND & OOD USING JAVA - JAINO NINE & FA HOSCH (JOHNWILEY)
8. STARTING OUT WITH JAVA - JONY GADDIS (DREAM TECH PRESS)
9. JAVA PROGRAMMING - SCHAUM'S SERIES
10. OBJECT ORIENTED APPLICATION DEVELOPMENT USING JAVA - ER DOXE ETC. (THOMSONPRESS)

MSCCS114	OPERATING SYSTEMS	OS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

UNIT - I

Computer System Overview - The Memory Hierarchy - I/O Communication Techniques.
Operating System Overview - The Evolution of Operating Systems - Microsoft Windows Overview - Modern UNIX Systems - Linux. Process Description and Control - Process States - Process Description - Process Control - UNIX SVR 4 Process management. Threads, SMP, and Micro kernels – Processes and Threads - symmetric Multiprocessing - Micro Kernels. (Chapters1to 4)

UNIT - II

CONCURRENCY: Mutual Exclusion and Synchronization - Principles of Concurrency - Mutual Exclusion : Hardware Support - Semaphores - Monitors - Message Passing - Readers / Writers problem. Concurrency: Deadlock and Starvation - Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - Dining Philosophers Problem - UNIX Concurrency Mechanisms. (Chapters 5, 6)

UNIT - III

Memory Management - memory management Requirements - Memory Partitioning- Paging - Segmentation. Virtual Memory - Hardware and Control Structures - Operating System Software. Uniprocessor Scheduling - Types of Processor Scheduling - Scheduling Algorithms - Traditional UNIX Scheduling. (Chapters 7, 8, 9)

UNIT - IV

I/O Management and Disk Scheduling - I/O Devices - Organization of the I/O Function -Operating System Design Issues - Disk Scheduling - Disk Cache.
File Management - File Organization and Access - File Directories - File Sharing - record Blocking - Secondary Storage Management - UNIX File Management. (Chapter 11, 12)

TEXT BOOK:
1. OPERATING SYSTEMS - BY - WILLIAM STALLINGS (V Edition)
REFERENCE BOOKS:

1. OPERATING SYSTEMS A MODERM PERSPECTIVE (Second Edition)BY - GARY NUTT (PEARSON)
2. APPLIED OPERATING SYSTEM BY - SILER SCHATZ, GALVIN (JOHN WILEY)
3. MODERN OPERATING SYSTEM BY - TANANBAM (PHI)
4. OPERATING SYSTEM PRINCIPLES BY - SILBERSCHATZ, GALIVN. GAGNE (JOHN WILEY)
5. OPERATING SYSTEMS BY - DM DHAMDHERE (TMH)
6. UNDER STANDING OPERATING SYSTEMS BY - IM FLYNN, AM MCHOCS (THOMSONPRESS)
7. OPERATING SYTEMS - DIETEL (PEARSON)
8. OPERATING SYSTEMS - RC JOSHI, S. TAPASWI (DREAM TECH)

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MSCCS115	COMPUTER NETWORKS		CN
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**		**EXTERNAL MARKS: 80**

U N I T - I

COMPUTER NETWORKS AND THE INTERNET: What is the Internet?, What is a Protocol?, The Network Edge, The Network Core, Access Networks and Physical Media, Delay and Loss in Packet-Switched Networks, Protocol Layers and Their Service Models, Internet Backbones, NAPs, and ISPs, A Brief History of Computer Networking and the Internet.
APPLICATION LAYER: Principles of Application Layer Protocols, The World Wide Web: HTTP, File Transfer: FTP, Electronic Mail in the Internet, DNS - The Internet's Directory Service. (Chapter 1 and Chapter 2.1 to 2.5)

U N I T - II

TRANSPORT LAYER: Transport-Layer Services and Principles, Multiplexing and DE multiplexing Applications, Connectionless Transport: UDP, Principles of Reliable Data Transfer, Connection-Oriented Transport: TCP, Principles   of Congestion Control. (Chapter 3.1 to 3.6)

U N I T - III

NETWORK LAYER AND ROUTING: Introduction   and   Network   Service   Models, Routing Principles, Hierarchical Routing, Inter Protocol, Routing in the Internet, What's Inside a Router? (Chapter 4.1 to 4.6)

U N I T - IV

LINK LAYER AND LOCAL AREA NETWORKS: The Data Link Layer: Introduction, Services, Error Detection and Correction Techniques, Multiple Access Protocols and LAN's, LAN Addresses and ARP, Ethernet, Hubs, Bridges, and Switches, IEEE 802.11 LANs, PPP: The Point-to-Point Protocol, Asynchronous Transfer Mode (ATM), X.25 and Frame Relay. (Chapter 5.1 to 5.10)

TEXT BOOK:

 1. COMPUTER NETWORKING A TOP-DOWN APPROACH FEATURING THE INTERNET BY –
 JAMES F. KUROSE AND KEITH W. ROSS (PEARSON)

REFERENCE BOOKS:

 1. BUSINESS DATA COMMUNICATION & NETWORKS By - FITZ GERALD (John Wiley)
 2. DATA & COMPUTER COMMUNICATIONS - W STALLINGS (PEARSON, PHI)
 3. COMPUTER COMMUNICATIONS&NETWORKING TOPOLOGIES-MAGALLO, V.M.HANCOCK (THOMSON)
 4. DATA COMMUNICATION & COMPUTER NETWORKS - R. AGARWAL, BB TIWARI (VIKAS)
 5. COMPUTER NETWORKS - AS TANENBAUM (PHI)
 6. COMPUTER NETWORKS - BLACK (PHI)
 7. UNDER STANDING COMMUNICATIONS & NETWORKS - WA SHAY (THOMSON)

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MSCCS116		OOPS LAB		OOPSL
WORK LOAD: 4 PPW		**REVIEW ASSESSMENT**		**EXTERNAL MARKS: 50**

1. Write a Java Program for sorting a given list of names in ascending order using Command line arguments.

2. Write a Java Program to multiply two given matrices.

3. Programs Illustrating Overloading & Overriding methods in Java.

4. Programs Illustrating the Implementation of Various forms of Inheritance. (Ex. Single, Hierarchical, Multilevel inheritance….)

5. Program which illustrates the implementation of multiple Inheritance using interfaces in Java.

6. Program illustrates the implementation of abstract class.

7. Programs to create packages in Java.

8. Program to Create Multiple Threads in Java.

9. Program to Implement Producer/Consumer problem using synchronization.

10. Program to Write Applets to draw the various polygons.

11. Create and Manipulate Labels, Lists, Text Fields, Text Areas & Panels

12. Handling Mouse Events & Keyboard Events.

13. Using Layout Managers.

14. Create & Manipulate the Following Text Areas, Canvas, Scroll bars, Frames, Menus, Dialog Boxes.

15. Programs which illustrate the manipulation of strings. Ex. 1 Sorting an array of Strings.

16. Frequency count of words & Characters in a text.

17. Programs which illustrates the use of files & Streams.

18. Java Program that reads on file name from the user and displays the contents of file.

19. Java Program that displays the no. of characters, lines & words in a text file.

20. Java Program to display the contents of file along with a line number before each line.

21. Java Program to read & write the data using Random Access File.

TEXT BOOK:

1. THE COMPLETE REFERENCE JAVA J2SE 5TH EDITION BY - HERBERT SCHILDT (TMH)

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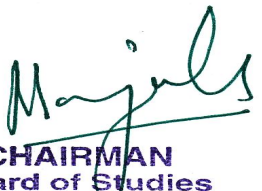FACULTY OF SCIENCE
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MSCCS117	COMPUTER NETWORKS LAB		NAPL
WORK LOAD: 4 PPW	REVIEW ASSESSMENT		EXTERNAL MARKS: 50

NETWORKS LABORATORY

PART A – Simulation Exercises
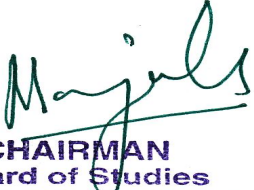***The following experiments shall be conducted using either NS228/OPNET or any other simulators.***

1. Simulate a three nodes point-to-point network with duplex links between them. Set the queue size vary the bandwidth and find the number of packets dropped.

2. Simulate a four node point-to-point network, and connect the links as follows: n0- n2, n1-n2 and n2-n3. Apply TCP agent between n0-n3 and UDP n1-n3. Apply relevant applications over TCP and UDP agents changing the parameter and determine the number of packets by TCP/UDP.

3. Simulate the different types of Internet traffic such as FTP a TELNET over a network and analyze the throughput.

4. Simulate the transmission of ping messaged over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

5. Simulate an Ethernet LAN using N-nodes(6-10), change error rate and data rate and Compare the throughput.

6. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and determine collision across different nodes.

7. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and plot congestion window for different source/destination.

8. Simulate simple ESS and with transmitting nodes in wire-less LAN by simulation And determine the performance with respect to transmission of packets.

MSCCS118	OPERATING SYSTEMS LAB	OSL
WORK LOAD: 4 PPW	REVIEW ASSESSMENT	EXTERNAL MARKS: 50

1. Simulate the following CPU Scheduling algorithms
 a) Round Robin
 b) SJF
 c) FCFS
 d) Priority
2. Simulate all file allocation strategies.
 a) Sequential
 b) Indexed
 c) Linked
3. Simulate MVT and MFT
4. Simulate all File organization techniques.
 a) Single level directory
 b) Two level
 c) Hierarchical
 d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm Dead Lock Prevention.
7. Simulate all Page replacement algorithms.
 a) FIFO
 b) LRU
 c) LFU
 d) Etc….
8. Simulate Paging Techniques of memory management.
9. Shell Programming.
 a) Writing Simple shell scripts
 b) Control structures - sequence, selection, iteration
 c) Pipes & Redirections
 d) Passing arguments to shell programs
 e) Simple programs using system calls
10. UNIX System Administration:
 a) User account maintenance
 b) Security
 c) Print jobs
 d) Backup
 e) Package installations
 f) Resource management
 g) Device drivers

M.SC. I YEAR II SEMESTER:

Paper No	Paper Title/Subject	Workload Per Week (L+T+P)	Marks			CREDITS
			Internal	External	Total	
MSCCS121	WEB TECHNOLOGIES	4+0+0	20	80	100	4
MSCCS122	AUTOMATA THEORY AND FINITE LANGUAGES	4+0+0	20	80	100	4
MSCCS123	UNIX NETWORK PROGRAMING	4+0+0	20	80	100	4
MSCCS124	SYSTEM SOFTWARE	4+0+0	20	80	100	4
MSCCS125	ARTIFICAL INTELLIGENCE	4+0+0	20	80	100	4
MSCCS126	WEB TECHNOLOGIES LABORATORY	0+0+4	--	50	50	2
MSCCS127	UNIX PROGRAMING LABORATORY	0+0+4	--	50	50	2
MSCCS128	SYSTEM SOFTWARE LABORATORY	0+0+4	--	50	50	2
	SEMINAR	02	25		25	1

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MSCCS121	WEB TECHNOLOGIES		WT
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**		**EXTERNAL MARKS: 80**

UNIT- I
Introduction to XHTML, Headers, Hyperlinks, Lists, Images, Tables, Frames, Forms.

Cascading Style sheets - Introduction, Inline Styles and Embedded Style Sheets, Linking external sheets.

JavaScript- Introduction, simple programming, Obtaining User Input with prompt Dialogs, Functions - program modules in JavaScript, programmer defined functions, function definition-Arrays.

(Text Book 1 chapters 4, 5, 6, 7, 10 and 11)

UNIT -II
JavaScript- Objects - Math Object, String Object, Date Object, document and window Objects.

Event Model - onclick, onload, onerror, onmouseover, onmouseout, onfocus, onblur, onsubmit, more DHTML events.

Extensible Markup Language(XML)- Introduction, Structuring Data, Document Type Definitions

(DTDs), Document Object Model (DOM), DOM Methods,
XSL.

(Text Book 1 chapters 12, 14 and 20)

UNIT - III
JDBC- Introduction, Drivers, API's, classes and interfaces, Exploring JDBC Processes with the java.sql. package and javax.sql package, working with Transactions.

(Text Book 2 -Chapter 3)

UNIT - IV
Servlets- Features of Servlets, servlet API, servlet Life Cycle, creating simple servlet, working with HttpServletRequest and HttpServletResponse interfaces, Forward , include, redirect, session tracking and cookes.

JSP-introduction, features, advantages of JSP, Architecture of JSP, Life Cycle, JSP Tags and

Implicit Objects, Action Tags in JSP. (Text Book 2 - Chapter 4, 5 and 7)

Text Book:
1. Internet& World Wide Web- H. M. Deitel, P.J. Deitel, A. B. Goldberg-Third Edition
2. Java Server Programming Java EE6 Black Book, Dreamtech press.

NOTE: One of the bits in each question should be a problem

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MSCCS122	AUTOMATA THEORY AND FINITE LANGUAGES		AFL
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**		**EXTERNAL MARKS: 80**

UNIT - I

FINITE AUTOMATA AND REGULAR EXPRESSIONS : Preliminaries,   Finite state systems, Nondeterministic finite automata (NFA), Deterministic finite automata (DFA), NFA TO DFA conversion Regular expressions, interconversions, Two-way finite automata,   finite automata with output, State minimization applications. PROPERTIES OF   REGULAR SETS: Pumping Lemma, closure properties of regular sets. (Chapters 1, 2, 3.1 and 3.2)

UNIT - II

CONTEXT FREE GRAMMARS (CFG):   Context free grammars Derivation tree, simplification of context - Free grammars, Normal forms. PUSHDOWN AUTOMATA: Informal description, Definitions, pushdown automata design. (Chapters 4.1 to 4.6, 5)

UNIT - III

PROPERTIES OF CONTEXT FREE LANGUAGES (CFL):   Pumping Lemma, closure properties, decision algorithms for CFLs. TURING MACHINES (TM): The turning machine & model, computable languages and functions, design of TM, modification of TM, Church's hypothesis. (Chapters 6, 7)

U N I T- IV

RECURSIVE & RECURSIVELY INNUMERABLE LANGUAGES: UNDECIDABILITY: Properties of recursive and recursively innumerable languages, Universal turing machine, post correspondence problem.   Decidable and Undecidable problems, universal turing machine, Rice's theorem.THE CHOMSKY HIERARCHY: Regular   grammars, Unrestricted grammars, interconversions between regular grammars and finite automata, context - sensitive languages, (Chapters 8.1 to 8.8, 9)

Text Book:

1. INTRODUCTION TO AUTOMATA THEORY LANGUAGES AND COMPUTATION By -
   J.E. HOPCROFT, J.D. ULLMAN (Narosa)

Note: For Examples refer the book. Introduction to computer Theory - DIA Cohen (John Wiley)

REFERENCE BOOKS:

1. INTRODUCTION TO COMPUTER THEORY-DAVIEL I.A.COHEN (John wiley, IInd Edition)
2. INTRODUCTION TO LANGUAGES AND THEORY OF COMPUTATION By - JOHN C. MARTIN (Second Edition TMH)
3. THEORY OF COMPUTATION   By - CHANDRA SEKHARAN & MISRA (PHI)
4. INTRODUCTION TO AUTOMATA THOERY, LANGUAGES & COMPUTATION - JE HOPFCROFT, R. MOTWANI, JD ULLMAN (PEARSON)
5. THE THEORY OF COMPUTATION BERNARD M MORET (PEARSON)
6. INTRODUCTION TO THEORY OF COMPUTATION - M SIPSER (THOMSON)
7. INTRODUCTION TO THEORY OF COMPUTER SCIENCE - EV KRISHNA MURTHY (EWP)
8. AN INTRODUCTION TO FORMAL LANGUAGES & AUTOMATA - PETER LINZ (NAROSA)
9. AUTOMATA & COMPULABILITY - DC KOZEN (SPINGER)
10. THOERY OF COMPUATATION - SK AZAD (DHANPAT RAI & CO)

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MSCCS123	UNIX NETWORK PROGRAMMING	UNP
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

U N I T - I
Inter-process Communication: Introduction, File and Record Locking, Simple Client- server Pipes, FIFO's, Streams and Messages, Name Spaces, System V IPC, Message Queues, Semaphores, Shared Memory, Socket and TLI. (Chapters 3, 3.1 to 3.12)

UNIT -II
A Network Primer Communication Protocols: Introduction, TCP/IP, XNS, SNA, NetBIOS, OSI Protocol, UUCP, Protocols Comparisons. (Chapters 4, 5, 5.1 to 5.8)

U N I T-III
Berkeley Sockets: Introduction, Overview, Unix Domain Protocols, Socket Addresses, Elementary Socket System Calls, Simple Examples, Advanced Socket System Calls, Reserved Ports, Stream Pipes, Passing File Descriptors, Socket Options, Asynchronous I/O, Input / Output Multiplexing, Out-of-Band and Data, Sockets and Signals, Internet Superserver, Socket Implementation. (Chapters 6, 6.1 to 6.17)

U N I T - IV
Transport, Overview, Transport Endpoint Addresses, Elementary TLI Functions, Simple Example, Advanced TLI Functions, Streams, TLI Implementation, Stream Pipes, Passing File Descriptors, Input/output Multiplexing, Asynchronous I/O, Out-of-Band Data. (Chapter 7.1 to 7.13)

TEXT BOOK:

1.UNIX NETWORK PROGRAMMING BY W. RICHARD STEVENS

REFERENCE BOOKS:

1.UNIX SYSTEMS PROGRAMMING - K.A. ROBBINS, S. ROBBINS (PEARSON)

2.UNIX THE C ODYSSEY - M. GANDHI, SHETTI, SHAH (BPB PUBLICATIONS)

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WARANGAL-506 009 (A. P.)

MSCCS124	SYSTEM SOFTWARE		SS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**		**EXTERNAL MARKS: 80**

U N I T – I
SYSTEMS PROGRAMMING**:** Assemblers Overview – Global Structure, .Stack Segment, .Data Segment, .Code Segment, Arithmetic – Addition, Subtraction, Multiplication, Division, Comments. Comparing and Branching – Decision making in Assembly, Unsigned Conditional jumps, Flags, Loops, Reading single characters, Sub programs-procedures, Macros – Declarations, Expansion, Parameters, Local Symbols, Parameter Separator, Assembly Listing. (Chapters 2,4,5,6,7,8 text book2)

U N I T – II
BACKGROUND: Introduction, System Software and Machine Architecture, The Simplified Instructional Computer (SIC), SIC Machine Architecture, SIC/XE Machine Architecture, Traditional (CISC) Machines, VAX Architecture, Pentium Pro Architecture, RISC Machines.
ASSEMBLERS: Basic Assembler Functions, A Simple SIC Assembler, Assembler Algorithm and Data Structures, Machine-Dependent Assembler Features, Instruction Formats and Addressing Modes, Program Relocation, Machine-independent Assembler Feature, Literals, Symbol-Defining Statements, Expressions, Program Blocks, Control Sections and Program Linking, Assemblers Design Options, One-Pass Assemblers, Multi-Pass Assemblers. (Chapters 1, 2 of text book1)

U N I T – III
LOADERS AND LINKERS: Basic Loader Functions, Design of an Absolute Loader, A Simple Bootstrap Loader, Machine-Dependent Loader Features, Relocation, Program Linking, Algorithm and Data Structures for a Linking Loader, Machine-Independent Loader Features, Automatic Library Search, Loader Options, Loader Design Options, Linkage Editors, Dynamic Linking, Bootstrap Loaders,
MACRO PROCESSOR: Basic Macro processor Functions, Macro Definition and Expansion, Macro Processor Algorithm and Data Structures, Machine-Independent Macro Processor Features, Concatenation of Macro Parameters, Generation of Unique Labels, Conditional Macro Expansion, Keyword Macro Parameters, Macro Processor Design Options.
(Chapters 3,4 of text book1)

U N I T – IV
COMPILERS: Compiler Functions: Grammars, Lexical Analysis, Syntactic Analysis, Code Generation, Machine-Dependent Compiler Features: Intermediate Form of the Program, Machine-Dependent Code Optimization, Machine-Independent Compiler Features: Structured Variables, Machine-Independent Code Optimization, Storage Allocation, Block-Structured Languages, Compiler Design Options: Division into Passes, Interpreters, P-Code compilers, Compiler-Compilers.(Chapters 4, 5 of text book 1)

TEXT-BOOK
1. SYSTEM SOFTWARE AN INTRODUCTION TO SYSTEMS PROGRAMMING -By LELAND L. BECK
2. ASSEMBLY LANGUAGE PROGRAMMING FOR THE IBM PC FAMILY- WILLIAM B JONES (DREAMTECH)

REFERENCE BOOK:

    1. SYSTEM SOFTWARE AND OPERATING SYSTEMS -By DHAMDHERE - TMH 2nd Edition SYSTEM PROGRAMMING - DONOVON

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MSCCS125	ARTIFICIAL INTELLIGENCE	AI
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

UNIT- I

ARTIFICIAL INTELLIGENCE: ITS ROOTS AND SCOPE, AI: HISTORY AND APPLICATIONS: From Eden to ENIAC: Attitudes toward Intelligence, Knowledge, and Human Artifice, Overview of AI Application Area

ARTIFICIAL INTELLIGENCE AS REPRESENTATION AND SEARCH: Introduction, The Prepositional Calculus, The Predicate Calculus, Using co Rules to Produce Predicate Calculus Expressions, Application: A Logic-Based Financial Advisor. (Chapters 1 and 2)

UNIT - II
STRUCTURES AND STRATEGIES FOR STATE SPACE SEARCH:
Introduction, Graph Theory, Strategies for State Space Search, Using the State Space to Represent Reasoning with the Predicate Calculus.

HEURISTIC SEARCH: Introduction, An Algorithm for Heuristic Search, Admissibility, Monotonicity, and Informed ness, Using Heuristics in Games, Complexity Issues.

CONTROL AND IMPLEMENTATION OF STATE SPACE SEARCH:
Introduction, Recursion-Based Search, Pattern-Directed Search, production Systems, TheBlackboard Architecture for Problem Solving. (Chapters 3, 4 and 5)

U N I T - III
REPRESENTATION AND INTELLIGENCE: THE AI CHALLENGE: KNOWLEDGE   REPRESENTATION: Issues in Knowledge Representation, A Brief History of AI Representational Systems, Conceptual Graphs: A Network   Language, Alternatives to Explicit Representation, Agent Based and Distributed Problem Solving.

STRONG METHOD PROBLEM SOLVING: Introduction, Overview of Expert System Technology, Rule-Based Expert Systems, Model-Based, Case Based, and Hybrid Systems, Planning. (Chapters 6 and 7)

U N I T - IV
REASONING IN UNCERTAIN SITUATIONS: Introduction, Logic-Based Abductive Inference, Abduction: Alternatives to Logic, The Stochastic Approach to Uncertainty. (Chapter 8)

TEXT BOOK
 1.   ARTIFICIAL INTELLIGENCE By George F Luger, Pearson Education.

REFERENCE BOOKS:
    1. ARTIFICIAL INTELLIGENCES By Ritch & Neight.
    2. INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS By D.W. Patterson (PHI-200)
    3. ARTIFICIAL INTELLIGENCE By Patrick Henry Winston
    4. PRINCIPLES OF ARTIFICIAL INTELLIGENCE (Narosa)
    5. Artificial Intelligence ByShiartRussel Peter Novvig (PHI)

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MSCCS126	WEB TECHNOLOGIES LAB		WTL
WORK LOAD: 4 PPW	REVIEW ASSESSMENT		EXTERNAL MARKS: 50

1. Create a simple HTML page which demonstrate all types of lists.
2. Create a letter head of your college using following styles
   - i. image as background
   - ii. use header tags to format college name and address
3. Create a web page, which contains hyper links like fruits, flowers, animals. When you click on hyper links, it must take you to related web page, these web pages must contains with related images.
4. Create a hyperlink to move around within a single page rather than to load another page.
5. Create a leave letter using different text formatting tags.
6. Create a table format given bellow using row span and column span.

RNO   NAME

Insert 5 records.

7. Create a table with different formats as given bellow.
   - i. Give different background and font colors to table header, footer and body.
   - ii. Use table caption tag.
8. Divide a web page vertically and horizontally with scroll bars, name them as shown bellow decorate it with some items. F1

8. Divide a web page as shown bellow.

9. Create a student Bio-Data, using forms.
10. Create a web page using following style sheets
    - i. Inline style sheets.
    - ii. Embedded style sheets.
    - iii. External style sheets

11. Create a web page using "class" style sheets with different "border-width" property values like thick, medium, thin, grove, inset, and outset, red & blue.

12. Accept marks from bellow form, calculate total and average, results must be shown in alert box.

13. Write a JavaScript program to accept name and index of name character from prompt box, convert name into uppercase and display name and index char in dialogbox.

14. Write a JavaScript program to accept two values from form and apply any 5 mathematical functions.
15. Display the current date and time in both GMT and local form.
16. Write a JavaScript program on MouseOver, MouseOut, blur events.
17. Write a XML program using document type definitions
18. Write Student database with XML.
19. Write a XML program using XS

(All exercises from the text book must be practiced in addition to the above problems)

Note: Programs are to be practiced on the basis of topics covered in corresponding theory paper for III & IV Units

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MSCCS127	UNIX NETWORK PROGRAMMING LAB	UNPL
WORK LOAD: 4 PPW	**REVIEW ASSESSMENT**	**EXTERNAL MARKS: 50**

Programs Using UNIX or LINUX

1. Write a program that takes one or more file/directory names as command line input and reports the following information on the file:
    a. File type
    b. Number of links
    c. Time of last access
    d. Read, Write, Execution permissions.
2.   Write a 'C' program that illustrates how to execute two commands concurrently with a command pipe.
3. Write a 'C' program that illustrates the creation of child process using fork system call.
4. Write a 'C' program that illustrates the real time of a day every 60 seconds.
5. Write a 'C' program that illustrates implementation of ls command.
6. Write a 'C' program that illustrates simple file locking.
7. Write a 'C' program that illustrates to read or write from a file.
8. Write a 'C' program that illustrates the following
    a. Creation of FIFO
    b. Reading from FIFO
    c. Writing on to the FIFO.
9. Write a 'C' program that illustrates sending the data from parent to child using PIPE System Call.
10. Write a 'C' program which displays the current working directory by using **popen**.
11. Write a 'C' program that illustrates the file locking using semaphores.
12. Write a 'C' program that illustrates Read or Write operation using semaphore.
13. Write a 'C' program that illustrates the creation of shared memory.
14. Write a 'C' program that illustrates inter-process communication using shared memory system calls.
15. Write a 'C' program that illustrates the following
    a. Creating a message queue
    b. Writing to a message queue
    c. Reading from a message queue

BOOK FOR REFERENCE:

1.   UNIX THE C ODYSSEY - M. GANDHI, SHETTI, SHAH (BPB PUBLICATIONS)
2.   UNIX NETWORK PROGRAMMING - W. RICHARD STEVENS

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MSCCS128	SYSTEM SOFTWARE LAB	SSL
WORK LOAD: 4 PPW	REVIEW ASSESSMENT	EXTERNAL MARKS: 50

1. Write a program to display a message
2. Write a program to print the alphabets from A-Z
3. Write a program to print the alphabets from Z TO A
4. Write a program to print the alphabets from a to z
5. Write a program to print the alphabets from z to a
6. Write a program to print 'A' character 5 times
7. Write a program to print natural numbers from 0 to 9
8. Write a program to add two single digits
9. Write a program to subtract two single digits
10. Write a Program to divide two single digits
11. Write a Program to print even numbers from 0-9
12. Write a program to display whether the given no is positive or negative
13. Write a program to find the given number is palindrome or not
14. Write a program to find the given number is Armstrong or not
15. Write a program to find the sum of the digits of a given number.
16. Write a program to find the given String is palindrome or not.
17. Write a program to search an element using linear search
18. Write a program to sort the elements using any one of the sorting technique.
19. Write a program to find the factors of a given number.
20. Write a program to find the given number is Prime or not.

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M.SC. II YEAR I SEMESTER:

Paper No	Paper Title/Subject	Workload Per Week (L+T+P)	Marks			CREDITS
			Internal	External	Total	
MSCCS211	CLOUD COMPUTING	4+0+0	20	80	100	4
MSCCS212	SOFTWARE ENGINEERING	4+0+0	20	80	100	4
MSCCS213	.NET PROGRAMMING	4+0+0	20	80	100	4
MSCCS214	CRYPTOGRAPHY AND NET WORK SECURITY	4+0+0	20	80	100	4
MSCCS215	DATA WAREHOUSING AND MINING	4+0+0	20	80	100	4
MSCCS216	.NET PROGRAMMING LABORATORY	0+0+4	00	50	50	2
MSCCS217	DATA MINING LABORATORY	0+0+4	00	50	50	2
MSCCS218	SOFTWARE ENGINEERIG LABORATORY	0+0+4	00	50	50	2
MSCCS219	SEMINAR	02	25		25	1
					675	27

MSCCS211	CLOUD COMPUTING	CC
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

U N I T – I

INTRODUCTION: Essentials, Benefits and need for Cloud Computing - Business and IT Perspective - Cloud and Virtualization - Cloud Services Requirements - Cloud and Dynamic Infrastructure - Cloud Computing Characteristics Cloud Adoption. CLOUD MODELS: Cloud Characteristics - Measured Service - Cloud Models - Security in a Public Cloud Public versus Private Clouds - Cloud Infrastructure Self Service. CLOUD AS A SERVICE: Gamut of Cloud Solutions - Principal Technologies - Cloud Strategy Cloud Design and Implementation using SOA - Conceptual Cloud Model - Cloud Service Defined

U N I T – II

CLOUD SOLUTIONS: Cloud Ecosystem - Cloud Business Process Management - Cloud Service Management - Cloud Stack - Computing on Demand (CoD) – Cloud is sourcing. CLOUD OFFERINGS: Information Storage, Retrieval, Archive and Protection - Cloud Analytics Testing under Cloud - Information Security - Virtual Desktop Infrastructure - Storage Cloud. CLOUD MANAGEMENT: Resiliency – Provisioning - Asset Management - Cloud Governance - High Availability and Disaster Recovery - Charging Models, Usage Reporting, Billing and Metering.

U N I T – III

CLOUD VIRTUALIZATION TECHNOLOGY: Virtualization Defined - Virtualization Benefits - Server Virtualization - Virtualization for x86 Architecture - Hypervisor Management Software - Logical Partitioning (LPAR)- VIO Server - Virtual Infrastructure Requirements. CLOUD VIRTUALIZATION: Storage virtualization - Storage Area Networks - Network-Attached storage - Cloud Server Virtualization - Virtualized Data Center.

U N I T – IV

CLOUD AND SOA: SOA Journey to Infrastructure - SOA and Cloud - SOA Defined - SOA and IaaS - SOA-based Cloud Infrastructure Steps - SOA Business and IT Services. CLOUD INFRASTRUCTURE BENCHMARKING: OLTP Benchmark - Business Intelligence Benchmark e-Business Benchmark - ISV Benchmarks - Cloud Performance Data Collection and Performance Monitoring Commands - Benchmark Tools.

TEXT BOOK:
1. Cloud Computing – Insight into New Era Infrastructure, Dr. Kumar Saurabh, Wiley India.

REFERENCE BOOKS:

1. Cloud Computing, Roger Jennings, Wiley India
2. Cloud Computing Explained, John Rhoton, Recursive Press
3. Cloud Computing Bible, Barry Sosinsky, Wiley
4. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Wiley
5. Cloud Computing for Dummies, Judith Hurwiz, Wiley Publishing.
6. The Cloud at your service, Rosenberg and Matheos, Manning Publications

MSCCS212	SOFTWARE ENGINEERING	SE
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

U N I T - I

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving Role of Software - Software - The Changing Nature of Software - Software myths. A GENERIC VIEW OF PROCESS: Software Engineering-A Layered technology - A Process frame work - The capability Maturity Model Integration (CMMI) - Process Patterns - Process Assessment - Personal and Team Process Models - process Technology - Product and Process. PROCESS MODELS: Prescriptive Models - The waterfall Model - Incremental Process Models-Evolutionary Process Models - Specialized Process Models - The Unified Process. (Chapters1, 2 and 3)

UNIT- II

SOFTWARE ENGINEERING PRACTICE: Software engineering Practice - Communication Practice-Planning Practices - Modeling Practices - Construction Practice - deployment
SYSTEM ENGINEERING: Compute-Based systems - The System Engineering Hierarchy - Business Process Engineering: An Overview - Product Engineering:An Overview - System Modeling.REQUIRMENT ENGINEERING: A Bridge to Design and Construction - Requirements EngineeringTasks - Initiating the Requirements Engineering Process - Eliciting Requirements-Developing Use - Cases - Building the analysis Model - Negotiating Requirements - Validating Requirements. BUILDING THE ANALYSIS MODEL: Requirements Analysis - Analysis Modeling Approaches – Data Modeling Concepts-Object-oriented Analysis - Scenario-Based Modeling - Flow-OrientedModeling - Class-Based Modeling - Creating a Behavioral Model. (Chapters 5, 6, 7, 8)

UNIT - III

DESIGN ENGINEERING: Design within the Context of Software Engineering - design Process andDesign Quality - Design Concepts - The Design Model - Pattern-Based Software Design. CREATING AN ARCHITECTURAL DESIGN: Software Architecture - Data Design - Architectural Styles and Patterns - Architectural Design- Assessing Alternative Architectural Designs - Mapping Data Flow into Software Architecture. MODELING COMPONENT-LEVEL DESIGN: What is a Component? - Designing Class-Based Component-Level Design - Object Constraint Language - designing Conventional Components. (Chapters 9, 10 and 11)

UNIT - IV

PERFORMING USER INTERFACE DESIGN: The Golden Rules - User Interface Analysis and Design- Interface Analysis - Interface Design Steps - Design Evaluation.RISK MANAGEMENT: Reactive vs. Proactive Risk Strategies - Software Risks - Risk Identification - Risk Projection - Risk Refinement - Risk Mitigation, Monitoring, and Management - The RMMM Plan.QUALITY MANAGEMENT: Quality Concepts - Software Quality Assurance - Software Reviews -Formal Technical Reviews - Formal Approaches to SQA - Statistical Software Quality Assurance -Software Reliability - The ISO 9000 Quality Standards - The SQA Plan. (Chapters 12, 25, 26)

TEXT BOOK:
1.   SOFTWARE ENGINEERING BY R.S. PRESSMAN (Mc. Graw Hill Sixth Edition)
REFERENCE BOOKS:
1.   SOFTWARE ENGINEERING BY GHEZZI (PHI)
2.   SOFTWARE ENGINEERING FUNDAMENTALS BY BEHFOROOZ AND HUDSON OXFORDUNIVERSITY PRESS
3.   SOFTWARE ENGINEERING BY FAIRLEY (Mc.Graw Hill)

MSCCS213	.NET PROGRAMMING	.NET
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

UNIT - I

Fundamentals of Visual Basic, Exception handling, windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels. (Chapters 1 to 7)

UNIT - II

WINDOWS FORMS: Different types of Bars, Menus, Views.
OBJECT - ORIENTED PROGRAMMING: Classes and objects constructors and destructors, inheritance, modifiers, Interfaces, Polymorphism, Vate Binding, Graphics handling and File handling. (Chapters 8 to 13)

UNIT - III

WEB FORMS: Working with web forms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls. (Chapters 14 to 19)

UNIT - IV

DATA ACCESS WITH ADO.NET : Accessing data with the server explorer, Data adapters and Data sets, Binding Controls to databases, Handling databases in code, Database access in Web Applications. Creating user Controls, Webuser Controls, and Multithreading creating Windows services, Web Services and Deploying applications. (Chapters 20 to 25)

TEXT BOOK:

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech- 2003) REFERENCE

REFERENCE BOOKS:

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halvosrson (PHI)
3. OOP with Microsoft Visual Basic.Net ByReynoldHacrtte (PHI)

MSCCS214	CRPTOGRAPHY AND NETWORK SECURITY	CNS
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

U N I T - I

INTRODUCTION:- Attacks, Services, and Mechanisms, Security Services. CONVENTIONAL ENCRYPTION: CLASSICAL TECHNIQUES: Steganography, Classical Encryption Techniques. CONVENTIONAL ENCRYPTION: MODERN TECHNIQUES:- Simplified DES. The Data Encryption Standard, Differential and Linear Cryptanalysis, Block Cipher Modes of Operation.

U N I T - II

CONFIDENTIALITY USING CONVENTIONAL ENCRYPTION:- Traffic Confidentiality, Random Number Generation. PUBLIC-KEY CRPTOGRAPHY:- Principles of Public-Key Cryptosystems, The RSA Algorithm, DiffieHellman Key Exchange, Elliptic Curve Cryptography. INTRODUCTION TO NUMBER THEORY:- Prime and Relatively Prime Numbers, Fermat's and Euler's Theorem, Euclid's Algorithm, The Chinese Remainder Theorem, Discrete Logarithms.

U N I T - III

MESSAGE AUTHENTICATION AND HASHFUNCTIONS:- AuthenticationRequirements, Authentication Functions, Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs. DIGITAL SIGNATURES AND AUTHENTICATION PROTOCOLS:- Digital Signatures, Authentication Protocols, Digital Signature Standard.

U N I T - IV

ELECTRONIC MAIL SECURITY: S/MIME. IP SECURITY: IP Security Overview, IP Security Architecture, Encapsulating Security Payload, Key Management. FIREWALLS: Firewall Design Principles, Trusted Systems. (Chapters 1,2,4,5,6,7,8,10,12,13 and 16)

TEXT BOOK:

1. CRYPTOGRAPHY AND NETWORK SECURITY principles and Practice FOURTH Edition By William Stallings (Pearson Asia)

REFERENCE BOOKS:

1. DAVIES &PRICE: SECURITY FOR COMPUTER NETWORKS - Wiley (1984)
2. MAYER &MATYAS: CRYPTOGRAPHY - Wiley B. SCHNEIER: APPLIED CRYPTOGRAPHY - (John Wiley)

MSCCS215	DATA WAREHOUSE AND DATA MINING	DMW
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

UNIT-I
Data Mining- Data Mining Overview, Kinds of Data can be mined, Kinds of patterns can be mined, Data Mining Functionalities, Technologies used, Data Mining Applications, Major issues in Data Mining,
Data objects and attribute types, Basic statistical descriptions of data, Measuring Data Similarity and Dissimilarity. (Chapters 1, 2.1 to 2.2.2, 2.4)

UNIT-II
Data Pre-Processing: Data Cleaning, Data Integration - Data reduction: Overview, Attribute subset selection, clustering, sampling, Data cube Aggregation, Histograms. Data Transformation and Data Discretization and concept Hierarchy Generation.
Data Warehouse: Basic Concepts, Data Warehouse modeling, Data Warehouse Design.
Data Warehouse implementation- Data cube implementation overview and OLAP server architecture, Attribute oriented induction. (Chapters 3.1 to 3.5, 4.1, 4.2, 4.3, 4.3.1, 4.3.2, 4.3.3, 4.4, 4.4.1, 4.4.4,4.5)

UNIT-III
Basic Concepts of frequent patterns- Frequent Item sets, Mining methods, Apriori and FP-Growth, Association rules.
Classification and Prediction: Classification by Decision Tree Induction-Information gain, Gini Index, Tree Pruning. Classification methods: Bayesian Classification, Rule-Based Classification. Model evolution and Selection: Metrics for evaluating (Chapters 6.1, 6.2, 8.1, 8.2, 8.3, 8.4, 8.5)

UNIT - IV
Cluster   analysis: Overview of Clustering Analysis Methods, Partitioning   Methods- K-Means, K-Medoids.   Hierarchical   methods- BRICH. Density-based methods- DB-SCAN, DENCLUE. Grid Based methods- STING. Evolution of Cluster Analysis Overview.
 Outliers, Outlier Analysis. (Chapters 10.1, 10.2, 10.3, 10.3.1, 10.3.2, 10.3.3, 10.4.1, 10.4.3, 10.5.1, 10.6, 12.1)

TEXT OOK:

1. DATA MINING CONCEPTS & TECHINIQUES BY JIAEEI HAN, MICHELINE & KAMBER
(3nEDITION) Harcourt India (Elsevier Publishing Company)

**REFERENCE
BOOKS:**
1. Data Mining Introductory and advanced topics-MARGARET H DUNHAM, PEARSON EDUCATION
2.Data Mining Techniques - ARUN K PUJARI, University Press.
3.Data Warehousing in the Real World - SAM ANAHORY &DENNIS MURRAY. Pearson Ed   Asia.
4.Data Warehousing Fundamentals - PAULRAJ PONNAIAH WILEY STUDENT   EDITION
5.DATA WAREHOUSING, DATA MINING & OLAP BY ALEX BERSON AND STEPHEN J. SMITH (TMH)

MSCCS216	.NET LAB	.NETL
WORK LOAD: 4 PPW	**REVIEW ASSESSMENT**	**EXTERNAL MARKS: 50**

- The concepts covered in the corresponding theory paper are to be implemented.

MSCCS217	DATA MINING LAB	DML
WORK LOAD: 4 PPW	**REVIEW ASSESSMENT**	**EXTERNAL MARKS: 50**

Weka is a collection of machine learning algorithms for data mining tasks. The algorithms can either be applied directly to a datasets#. Weka contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization.

Launching WEKA, COMMAND-LINE(simple CLI), EXPLORER-User Interface, Preprocessing, Classification, Clustering, Associating, Selecting Attributes, Visualizing; EXPERIMENTER-Simple, Advanced; KNOWLEDGEFLOW-Introduction, Features, Components; ArffViewer; Converters;etc.,

RESOURCES:

Manuals and Software:
- http://www.cs.waikato.ac.nz/ml/weka/index.html
  Collections of Datasets:
- # http://www.cs.waikato.ac.nz/ml/weka/datasets.html

MSCCS218	SOFTWARE ENGINEERING LAB	STL
WORK LOAD: 4 PPW	**REVIEW ASSESSMENT**	**EXTERNAL MARKS: 50**

SOFTWARE TESTING – Introduction, purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle. Basic Structural Modeling: Classes, Relationships, Class & Object Diagrams. Interactions, Interaction diagrams, Use cases, Use case Diagrams, Activity Diagrams, Component, Deployment, Component diagrams and Deployment diagrams; Caste Study on Unified Library Application(ULA).

To learn and use the testing tools to carry out the functional testing, load/stress testing and use the following (or similar) automated testing tools to automate testing:

　　　　a) Win Runner/QTP for functional testing.

　　　　b) Load Runner for Load/Stress testing.

　　　　c) Test Director for test management.

List of Sample Programs /Experiments

1. The student should take up the case study of Unified Library Application (ULA) which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

2. Student has to take up another case study of his/her own interest and do the same whatever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned and it would be referred for some new idea.

REFERENCE BOOKS:

1. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech

2. Software Testing Concepts and Tools, P.Nageswara Rao, Dreamtech Press.

3. Grady Booch, James Rumbaugh, Ivan Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition

MSCCS219	SEMINAR		S
WORK LOAD: 0 2	**INTERNAL MARKS: 25**	**EXTERNAL MARKS: 00**	

- This course is meant to give students practice speaking in front of an audience and to explore topics of their own choosing in detail.
- Students will research topics and organize presentations for faculty and other students. The topics may be any aspect of the Computer science and must be approved by the instructor in advance.
- To help students improve as speakers, each student will receive feedback from the fellow students and the instructor.

Expectations:
- Attendance at each seminar is mandatory for all students enrolled.
- In addition, students are expected to attend all other seminars in the department, such as invited guest speakers. It is expected that students will actively participate by asking questions of the speaker.
- The effort by students to meet these expectations will be considered in the determination of your final grade.

M.SC. II YEAR II SEMESTER:

Paper No	Paper Title/Subject	Workload Per Week L+T+P	Marks			CREDITS
			Internal	External	Total	
MSCCS221	PROGRAMMING WITH R	4+0+0	20	80	100	4
MSCCS222	PROGRAMMING WITH R LAB	0+0+4	00	50	50	2
MSCCS223	MAJOR PROJECT	0+0+0	75	175	250	10
MSCCS224	COMPREHENSIVE VIVA	0+0+0	00	50	50	2
MSCCS225	SEMINAR	02	25	00	25	1
					475	19

MSCCS221	PROGRAMMING WITH R	DAR
WORK LOAD: 4 PPW	INTERNAL MARKS: 20	EXTERNAL MARKS: 80

Unit I
Introduction- What Is R?, Installing R, Choosing an IDE, Your First Program, Installing Extra Related Software, *Scientific Calculator-* Mathematical Operations and Vectors, Assigning Variables, Special Numbers, Logical Vectors; *Inspecting Variables-* Classes, Different Types of Numbers, Other Common Classes, Checking and Changing Classes, Examining Variables, Workspace

Unit II
*Vectors, Matrices, and Arrays; Lists and Data Frames-*Lists, NULL, Pairlists, Data Frames; *Environments and Functions*

Unit III
Strings and Factors, Flow Control and Loops, Advanced Looping; Packages- Loading Packages, Installing Packages, Maintaining Packages; *Dates and Times-*Date and Time Classes, Conversion to and from Strings, Time Zones, Arithmetic with Dates and Times, Lubridate.

Unit IV
*Getting Data-*Built-in Datasets, Reading Text Files, Reading Binary Files, Web Data, Accessing Databases; *Cleaning and Transforming-* Cleaning Strings, Manipulating Data Frames, Sorting, Functional Programming; *Exploring and Visualizing-* Summary Statistics, Three Plotting Systems, Scatterplots, Line Plots, Histograms, Box Plots, Bar Charts, Other Plotting Packages and Systems

TEXT BOOK:
1. Richard cotton "A step-by-step function guide to data analysis: Learning R" First edition, O'REILLY, 2013

REFERENCES
1. Michael J. Crawley "The R Book" Second Edition A John Wiley & Sons, Ltd., Publication, 2013.
2. Garrett Grolemund "Hands-On Programming with R" First Edition, O'Reilly Media, 2014
3. Roger D. Peng "R Programming for Data Science" Leanpub, 2014-15.

MSCCS222	PROGRAMMING WITH R LAB	DARL
WORK LOAD: 0 4	INTERNAL MARKS: 00	EXTERNAL MARKS: 50

- The concepts covered in the corresponding theory paper are to be implemented.

MSCCS223	MAJOR PROJECT		MP
WORK LOAD: 0 0	INTERNAL MARKS: 75	EXTERNAL MARKS: 175	

The Project work constitutes a major component in most professional programmes. It needs to be carried out with due care, and should be executed with seriousness by the students. The project work is not only a partial fulfillment of the MSC requirements, but also provide a mechanism to demonstrate ASK (Attitude, Skills, and Knowledge) with specialization. The project work should compulsorily include the software development. Physical installations/configuring of LAN/WAN or theoretical projects or study of the systems, which doesn't involve s/w development, *ARE STRICTLY NOT ALLOWED.*

The students are expected to work on a real-life project preferably in some industry/ R&D Laboratories / Educational Institution / Software Company. Students are encouraged to work in their interested area. The student can formulate a project problem with the help of his / her Guide of the concerned college. APPROVAL OF THE PROJECT PROPOSAL IS MANDATORY by his/her Guide. If approved, the student can commence working on it, and complete it. Use the latest versions of the software packages for the development of the project. Project problem domain selected and the specifications should be genuine.

MSCCS224	COMPREHENSIVE VIVA		CV
WORK LOAD: 0 0	INTERNAL MARKS: 00	EXTERNAL MARKS: 50	

- **Objective**

  Viva voce will be conducted towards the end of the semester which will be covering the complete syllabus. This will test the student's learning and understanding during the course of their post graduate programme. In doing so, the main objective of this course is to prepare the students to face interview both at the academic and the industrial sector.

- **Examination**
  Every student will be required to undergo comprehensive Viva-voce at the end of fourth semester of M.Sc.CS.   A panel of external and internal examiners conducts the comprehensive viva-voice examination. The examiners award the marks out of a maximum of 50 marks.

- **Contents**
  The viva-voce shall normally cover the subjects taught in all the semester of M.Sc. Computer Science programme.

MSCCS225	SEMINAR		S
WORK LOAD: 0 2	**INTERNAL MARKS: 25**	**EXTERNAL MARKS: 00**	

- This course is meant to give students practice; speaking in front of an audience and to explore topics of their own choosing in detail.
- Students will research topics and organize presentations for faculty and other students. The topics may be any aspect of the Computer science and must be approved by the instructor in advance.
- To help students improve as speakers, each student will receive feedback from the fellow students and the instructor.

Expectations:
- Attendance at each seminar is mandatory for all students enrolled.
- In addition, students are expected to attend all other seminars in the department, such as invited guest speakers. It is expected that students will actively participate by asking questions of the speaker.
- The effort by students to meet these expectations will be considered in the determination of your final grade.