KAKATIYA UNIVERSITY WARANGAL
DEPARTMENT OF COMPUTER SCIENCE

COURSE STRUCTURE FOR M.SC. (CSC) WITH EFFECT FROM 2013-14

M.SC. I YEAR I SEMESTER:

Paper No	Paper Title/Subject	Workload Per Week (Theory : Lab)	Marks		
			Internal	External	Total
MSCCS111	DISCRETE MATHEMATICS	T(04)	20	80	100
MSCCS112	COMPUTER ORGANIZATION	T(04)	20	80	100
MSCCS113	OOPS WITH JAVA	T(04)	20	80	100
MSCCS114	OPERATING SYSTEMS	T(04)	20	80	100
MSCCS115	COMPUTER NETWORKS	T(04)	20	80	100
MSCCS116	OOPS LABORATORY	L(04)	--	50	50
MSCCS117	COMPUTER NETWORK S LABORATORY	L(04)	--	50	50
MSCCS118	OPERATING SYSTEM LABORATORY	L(04)	--	50	50
					650

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)

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. 3. COMPUTER SYSTEMS ORGANISATION& ARCHITECTURE BY -CARPINELLI, (ADDISON WESLEY)
4. THE ARCHITECTURE OF COMPUTER HANDWONE AND SYTEMS HANDWONE BY- I ENGLANDER (WILEY)
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)

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)
11. THINKING IN JAVA -BY - BRUCE ECKEL (PEARSON)
12. PROGRAMMING & PROBLEM SOLVING WITH JAVA - JM SLACK (THOMSON)
13. COMPUTING CONCEPTS WITH JAVA2 ESSENTIALS - CAY HORSTMANN (JOHNWILEY)
14. JAVA PROGRAMMING ADVANCED TOPICS - J WIGGLESWORTH, P LUMBY MSCCS114

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. 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)

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)

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)

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.

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