KAKATIYA UNIVERSITY, WARANGAL

DEPARTMENT OF COMPUTER SCIENCE

MCA COURSE STRUCTURE WITH EFFECT FROM 2013-14

MCA I YEAR II SEMESTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS		
			Internal	External	Total
MCA121	Data Structures	T (4)	20	80	100
MCA122	Object Oriented Programming	T (4)	20	80	100
MCA123	System Software	T (4)	20	80	100
MCA124	Operating System	T (4)	20	80	100
MCA125	Probability and Statistical Methods	T (4)	20	80	100
MCA126	Data Structures Laboratory	L (4)	--	50	50
MCA127	Object Oriented Programming Laboratory	L (4)	--	50	50
MCA128	Operating System & System Software Laboratory	L (4)	--	50	50
					650

MCA121	DATA STRUCTURES	DS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

UNIT – I

INTRODUCTION: The Abstract Data Type – A Model for an Abstract Data Type – Algorithm Efficiency. SEARCHING: List Searches – C ++ Search Algorithms – Hashed List Searches – Collision Resolution. LINKED LISTS: Linear List Concepts – Linked List Concepts – Linked List Algorithms – Processing a Linked List – Circularly Linked Lists – Doubly Linked Lists – List Abstract Data Type-Linked List Implementation. STACKS: Basic Stack Operations – Stack Linked List Implementation – Stack Applications – Stack ADT–Array Implementation. (Chapters 1,2, 3.4)

U N I T – II

QUEUES: Queue Operations – Queue Linked List Design – Queue Applications – Queue ADT-Linked List Implementation – Queue ADT-Array Implementation. RECURSION: Designing Recursive Algorithms – The Towers of Hanoi – C ++ Implementations of Recursion. INTRODUCTION TO TREES: Binary Trees – Binary Tree Traversals – Expression Trees – General Trees. SEARCH TREES: Binary Search Trees.AVL Trees and their implementation (Chapters 5 to 8,)

U N I T – III

HEAPS: Heap Definition – Heap Structure – Basic Heap Algorithms – Heap Data Structure – Heap Algorithms – Heap Applications.MULTIWAY TREES: m-way Search Trees – implified B-Trees-B tree Variations. ADVANCED SORTING CONCEPTS: General Sort Concepts – Insertion Sorts – Selection Sorts – Exchange Sorts – External Sorts. GRAPHS: Operations – Graph Storage Structures – Graph Algorithms. (Chapters 9, 10, 11, 12 of 1st Text Book)

U N I T – IV

ALGORITHM DESIGN TECHNIQUES: Greedy Algorithms — Divide and Conquer –Dynamic Programming — Ordering Matrix Multiplications – Backtracking Algorithms (Chapters 10.1, 10.2, 10.3, 10.5, of 2nd Text Book)

TEXT BOOKS

1 DATA STRUCTURES A PSEUDOCODE APPROACH WITH C ++ BY – RICHARD F. GILBERG. BEHROUZ A. FOROUZAN (THOMSON PRESS)
2 DATA STRUCTURES & ALGORITHM ANALYSIS IN C ++ BY – MARK ALLEN WEISS.

MCA122	Object Oriented Programming	OWJ
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

UNIT I
Java Fundamentals- Introducing Data Types and Operators- Program Control Statements (Chapters 1, 2, 3)

UNIT II
Introducing Classes, Objects and Methods-Arrays, Irregular Arrays- A Closer Look at Methods and Classes- Inheritance (Chapters 4, 5, 6, 7)

UNIT III
Packages and Interfaces – Exception Handling – Multithreaded Programming – Enumerations, Autoboxing, Static Import and Annotations (Chapters 8, 9, 11, 12)

UNIT IV
Using I/O- Applets, Events and Miscellaneous Topics – Introducing Swings (Chapters 10, 14, 15)

TEXT BOOK:
1.   Java A Beginner's Guide, Fifth Edition, Tata McGRAW-HILL
References
1.   Beginning Java, Java 7th Edition, Ivor Horton's, Wiley India Edition.
2.   Java the Complete Reference 8th Edition, Herbert Schildt, Tata McGrawHill Edition.

MCA123	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
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)

MCA124	**OPERATING SYSTEMS**	**OS**
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

U N I T - I
INTRODUCTION: What is an Operating Systems?, Mainframe Systems, Desktop Systems, Distributed Systems, Real-Time Systems, Handheld Systems, Feature Migration, Computing Environments. COMPUTER-SYSTEM STRUCTURES: Computer-System Operation, I/O Structure, Storage Structure, Hardware protection, Network Structure. OPERATING SYSTEM STRUCTURE: System Components, Operating System Services, System Calls, System Programs, System Structure, Virtual Machines, System Design and Implementation. PROCESSES: Process Concept, Process Scheduling, Operations on Processes, Cooperating Processes, Inter process Communication, communication in Client-Server Systems. Multithreading concepts, Multithreading Models, Java Threads. (Chapters 1, 2, 3, 4 and 5)

U N I T - II
CPU SCHEDULING: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Process Scheduling Models. PROCESS SYNCHRONIZATION: Background, The Critical-Section Problem, synchronization Hardware, Semaphores, Critical Regions, Monitors, OS Synchronization. DEADLOCKS: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection. (Chapters 6, 7 and 8)

U N I T - III
MEMORY MANAGEMENT: Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation. VIRTUAL MEMORY: Background, Demand Paging, Process Creation, Page Replacement, Allocation of Frames, Thrashing. FILE SYSTEM INTERFACE & IMPLEMENTATION: File Concept, Access Methods, Directory Structure, File-System Mounting, File Sharing, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space Management, and Recovery. (Chapters 9, 10, 11 and 12)

U N I T - IV

MASS-STORAGE STRUCTURE: Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, RAID Structure, Disk Attachment, Stable-Storage Implementation. PROTECTION: Goals of Protection, Domain of Protection, Access Matrix, Implementation of access Matrix, Revocation of Access Rights, Capability-Based Systems. (Chapters 14 and 18)

TEXT BOOKS
1. OPERATING SYSTEM CONCEPTS (6th Edition) By - SILBERSCHATZ, GALVIN, GAGNE Jhon-Wiley (2002)

REFERENCE BOOKS
1. OPERATING SYSTEMS (IV Edition) By - William Stallings PHI (2002)
2. OPERATING SYSTEMS By - GARY NUTT (Pearson Education)
3. OPERATING SYSTEMS By - CHARLES CROWLEY TMH (2000)
4. MODERN OPERATING SYSTEMS By - A.S. TANENBAUM (PHI) (2002)
5. OPERATING SYSTEMS BY – DM DHAMDHERE (TMH)
6. UNDER STANDING OPERATING SYSTEMS BY – IM FLYNN, AM MCHOCS (THOMSON PRESS)
7. OPERATING SYTEMS – DIETEL (PEARSON)

MCA125	PROBABILITY AND STATISTICAL METHODS	PSM
WORK LOAD: 4 PPW	**INTERNAL MARKS: 20**	**EXTERNAL MARKS: 80**

U N I T - I
INTRODUCTION TO STATISTICS: Data Collection and Tabulation, Graphical Representation of Data Measures of Central Tendency and Dispersion, Moments, Skewness and Kurtosis. PROBABILITY: Basic Concepts and Terms, Probability Distribution Functions: Uniform, Binomial, Poisson, Mathematical Expectation, Normal and X2 Distributions.

U N I T - II
CORRELATION AND REGRESSION: Correlation Coefficient, Bivariate Correlation, Karl Pearsons Formula, Rank Correlation, Regression. Linear Regression Equations, Regression Coefficient - Multiple-Correlation. Analysis of Variance and Regression Analysis.

U N I T - III
TESTING OF STATISTICAL HYPOTHESIS: X2 Tests for Variance, Tests for Mean of a Single Sample, Two Sample Means some tests based on F Distribution.

U N I T - IV
ANALYSIS OF VARIANCE: One Way Classification, Two Way Classification, Statistical Analysis of Data.

TEXT BOOK
> 1. FUNDAMENTALS OF APPLIED STATISTICS – BY - GUPTA AND KAPOOR

REFERENCE BOOKS
> 1. FUNDAMENTAL OF MATHEMATICAL STATISTICS BY - V K KAPOOR AND GUPTA SC
> 2. STATISTICS (PHI) BY - FREUD
> 3. PROGABILITY STATISTICS AND RANDOM PROCESS BY - R VEERA RAJAN (TMH)
> 4. INTRODUCTION TO PROBABILITY & STATISTICS BY - J.S. MILTON & JC ARNOLD (TMH)
> 5. MILLER & FERUNDS PROBABILITY & STATISTICS FRO ENGINNER BY - JOHNSON (PEARSON)
> 6. PROBABILITY & STATISTICS FRO ENGINEERS & STATISTICSTS BY - WALPOSE (PEARSON)

MCA126	DATA STRUCTURES Laboratory	DSL
WORK LOAD: 4 PPW	ASSIGNMENTS ASSESSMENT	EXTERNAL MARKS: 50

NOTE:
- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about PG standard programs it should be minimum 45 – 50.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

MCA127	OBJECT ORIENTED PROGRAMMING Laboratory	OWJL
WORK LOAD: 4 PPW	ASSIGNMENTS ASSESSMENT	EXTERNAL MARKS: 50

NOTE:
- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about PG standard programs it should be minimum 45 – 50.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

MCA128	OPERATING SYSTEM AND SYSTEM SOFTWARE Laboratory	OS&SSL
WORK LOAD: 4 PPW	ASSIGNMENTS ASSESSMENT	EXTERNAL MARKS: 50

NOTE:
- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about PG standard programs it should be minimum 45 – 50.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.