KAKATIYA UNIVERSITY, WARANGAL

DEPARTMENT OF COMPUTER SCIENCE

BCA COURSE STRUCTURE WITH EFFECT FROM 2015-16

BCA I YEAR

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS		
			Internal	External	Total
BCA11	FUNDAMENTALS OF INFORMATION TECHNOLOGY	T (4)	30	70	100
BCA12	PROGRAMMING IN 'C'	T (4)	30	70	100
BCA13	COMMUNICATIVE ENGLISH	T (4)	30	70	100
BCA14	DESCRETE MATHEMATICS	T (4)	30	70	100
BCA15	SYSTEM APPROACH TO MANAGEMENT	T (4)	30	70	100
BCA16	FUNDAMENTALS OF INFORMATIION TECHNOLOGY LAB	L (4)	--	50	50
BCA317	PROGRAMMING IN 'C' LAB	L (4)	--	50	50
					600

BCA II YEAR/ I SEMISTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS		
			Internal	External	Total
BCA211	OBJECT ORIENTED PROGRAMMING WITH C++	T (4)	30	70	100
BCA212	PROBABILITY AND STATISTICAL METHODS	T (4)	30	70	100
BCA213	COMPUTER ORGANIZATION	T (4)	30	70	100
BCA214	OPERATING SYSTEM	T (4)	30	70	100
BCA215	BASIC WEB PROGRAMMING	T (4)	30	70	100
BCA216	C++ LAB	L (4)	--	50	50
BCA217	IT LAB	L (4)	--	50	50
					600

BCA II YEAR/ II SEMISTER:

Paper No	Paper Title / Subject	Workload Per week (Theory : Lab)	MARKS		
			Internal	External	Total
BCA221	DATA STRUCTURES With C++	T (4)	30	70	100
BCA222	OPERATION RESEARCH	T (4)	30	70	100
BCA223	UNIX PROGRAMMING	T (4)	30	70	100
BCA224	SOFTWARE ENGINEERING	T (4)	30	70	100
BCA225	MANAGEMENT INFORMATION SYSTEM	T (4)	30	70	100
BCA226	DS- LAB	L (4)	--	50	50
BCA227	UNIX- LAB	L (4)	--	50	50
					600

BCA111	FUNDAMENTALS OF INFORMATION TECHNOLOGY	FIT
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I

Introduction to Computer: Definition, Characteristics, Generation of Computers, Capabilities and Limitations, Introduction to Operating System, Concept of Bios, Booting Files. Basic Components of a Computer System - Control Unit, ALU, Input/output functions and characteristics. Memory Introduction, Classifications- Volatile Memory and Non- Volatile , Flash Memory, RAM, ROM, EPROM, PROM, EEPROM other types of memory**.**

M-DOS: Internal and External Commands, Difference between External and Internal Commands. Internal Commands MD, CD, RD, COPY CON, TYPE, DATE & TIME, VOLUME VERSION, REN, PROMPT, CLS, DIR/P/W, COPY, DEL Etc. External commands - FORMAT, DISKCOPY, DISKCOMP, XCOPY, CHKDISK, SCANDISK, HELP, DEBUG, PRINT etc.

UNIT II

Windows concepts, Features, Desktop, Taskbar, Start menu, My Computer, Recycle Bin, Windows Accessories, Windows Explorer.

MS-Office: Introduction to MS-Office, MS-Word: Word Basics, working with formatted text, Shortcut keys, Formatting documents: Selecting text, Copying & moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header & footer, Bullets & numbering, Tabs, Forming tables. Finding & replacing text, go to (F5) command, proofing text (Spell check, Auto correct), Reversing actions, Macros, Inserting pictures, Hyperlinks, Mail merging, Printing documents.

UNIT III

Spreadsheets, workbooks, creating, saving & editing a workbook, Renaming sheet, cell entries (numbers, labels, and formulas), spell check, find and replace, Adding and deleting rows and columns Filling series, fill with drag, data sort, Formatting worksheet, Functions and its parts, Some useful Functions in excel (SUM, AVERAGE, COUNT, MAX, MIN, IF), Cell referencing (Relative, Absolute, Mixed), What-if analysis Introduction to charts: types of charts, creation of charts, printing a chart, printing worksheet.

UNIT IV

Presentation Software, Uses, Presentation tips, components of slide, templates and wizards, using template, choosing an auto layout, using outlines, adding subheadings, editing text, formatting text, using master slide, adding slides, changing color scheme, changing background and shading, adding header and footer, adding clip arts and auto shapes. Various presentation, Working in slide sorter view (deleting, duplicating, rearranging slides), adding transition and animations to slide show, inserting music or sound on a slide, viewing slide show, Printing slides.

UNIT V

Database Management System, An Overview of Access, Data Types, Creating Tables, Queries, Creating Relationships, Forms, Reports.

TEXT-BOOKS:

1. Computer Fundamentals – P.K. Sinha.
2. Introduction to Computers – N. Subramanian.
3. Introduction to Computers – Peter Norton Mcgraw Hill.
4. Fundamentals of Computers, by Rema Tharaja, Oxford University Press India, 2014.
5. MS–Office _ BPB Publications.

BCA112	PROGRAMMING IN 'C'	PCS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I

About C, Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Character set in C, Keywords in C, Hierarchy of operators, Basic data types, Variables in C, Type declaration, Output function, Input function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators.

Control statements, if statement, if else statement, for statement, while loop, do while statements, break statement, continue statement, switch statement, goto statement, ternary operators.

UNIT II

Arrays, advantages of arrays, types of arrays, array declaration, array initialization, accessing data from array, array inside the memory, multidimensional arrays.

Character arrays, String Variables, Reading & writing strings, string handling functions.

UNIT III

Introduction of Static and Dynamic memory allocation, The process of Dynamic memory allocation, DMA functions malloc() function, sizeof() operator, Function free(), Function realloc().

Functions, advantages of functions, declaring a function, calling a function, variables, passing arguments to a function, passing array to functions, recursion in functions, Call by Value, Call by Address.

UNIT IV

Structure, declaration of structure, Union, difference between structure and union, Pointers, pointer arithmetic, Pointers and function, Array of pointers, Pointer and Strings, Pointer to structure.

Storage classes: auto, static, extern register.

UNIT V

Introduction File handling: File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing a character, Reading a character, Using fopen(), getc(), putc(), and fclose(), Using feof().

Working with string, fputs() and fgets(), Standard streams in C, Flushing a stream, Using fread() and fwrite(), Direct access file, fseek() and random access I/O, fprintf() and fscanf(), getting file name as Command line arguments.

Preprocessor, # define- defining functions like macros, #include, creating header files, include user defined header files.

Textbooks:
1. Computer Science: A Structured Programming Approach using C, B. A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M. Ghosh, Oxford University Press.

References:
1. Scaum Outline Series: "Programming in C".
2. Dennis & Ritchie: "Programming in C".
3. Stephen G. Kochar: "C Programming".
4. Programming in ANSI C, E. Balgurusamy Tata McGraw Hill, New Delhi, 5th Edition.

BCA113	COMMUNICATIVE ENGLISH	CCE
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Words and Sentences, Parts of speech, Articles, Verbs/ Tenses, Reported Speech, The passive.

UNIT II
Introduction to Communication: Meaning and Definition, Objectives, Principles of Communication, Scope, Limitations. Barriers to Communication.

UNIT III
Communication process: Meaning & Concept, Elements of Communication, and Media of Communication: Written, Oral, face-face, visual, audiovisual, computer based communication

UNIT IV
Composition, Paragraph writing. Business Letters: Need and functions of business letters - Planning & layout of business letter - Types of business letters and letter writing, Application for employment and resume - Notices, Agenda and Minutes of the Meetings.

UNIT V
Phonetics, presentation skills

Reference Books:
1. Rajendra Pal & Korla Halli ,Essentials of Business Communication .
2. Dr. Urmila Rai and S M Rai,Business Communication.
3. Kaul, Asha. Business Communication., Prentice-Hall, New Delhi, 2006.
4. Ober, Scot. Contemporary Business Communication, 5th Edition. Biztantra, New Delhi, 2004.
5. Daniel Jones, Pronouncing Dictionary.

BCA114	**DISCRETE MATHEMATICS**	**DM**
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Sets, relations and functions, problem solving strategies, fundamentals of logic, logical inferences, first order logic, mathematical induction.

Elementary Combinations: Combinations and permutations, enumerations with repetitions, with constrained repetitions, Principle of Inclusion-Exclusion.

UNIT II
Graphs: Basic Concepts, Isomorphism, Trees, Spanning Trees, Binary Trees, Planar Graphs, Euler Graphs.

Boolean Algebra: Introduction to Boolean Algebra Functions, Switching Mechanisms, Minimization of Boolean Functions, Applications to Boolean Design, Finite State Diagrams

UNIT III
Introduction to Statistics: Data Collection and Tabulation, Graphical Representation of Data Measures of Central Tendency and Dispersion, Moments, Skewness and Kurtosis.
Random Variable and Mathematical Expectation of a R.V.

Probability: Introduction to Probability, Mutually Exclusive and Independent Events, Dependent Events and Conditional Probability. Addition and multiplication theorem of probability

UNIT IV
Discrete Probability Distributions: Binomial Distribution, The Hyper Geometric Distribution, The Poisson Distribution, The Trinomial Distribution.

The Normal Distribution: Introduction to The Normal Distribution, Applications of The Normal Distribution, The Normal Approximation to the Binomial Distribution.

UNIT V
Sampling Distribution: Sampling and The Distribution Of Sample means, Applications of Central Limit Theorem, The T-Distribution For Small Samples.

Estimation: Confidence Intervals for Means, Confidence Intervals For Means Based On Small Sample, Confidence Intervals For Proportions

TEXT BOOKS:
1. Discrete Mathematics For Computer Scientist And Mathematicians By Joe L.Mott, Abraham Kandel, Theodore P.Baker.Z
2. Contemporary Statistics A Computer Approach, S.P.Gordan And F.S.Gordan(Mcgraw Hill1994)
3. Discrete Mathematics By Trembely And Manohar. (Tmh).Z
4. Discrete Mathematics By Bernord Kolnan, Robert C.Busby And Sharon Ross (Phi Third Edition)
5. Theory And Problems Pf Probability By Seymour Lipschutz(Schaum Series Tmh)
6. Stastical Methods By S.P.Gupta(Shand & Co).Op.

BCA115	SYSTEM APPROACH TO MANAGEMENT	SAM
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I:

Principles Of Bussiness Organization: Commerce, Trade, Business, Industry, Forms Of Business Organization – Sole Trade, Partnership, Join Stock Companies, Types, Promotion, Incorporation. Type Of Shares And Debentures, Stock Exchange, Meaning, Definition, Functions, working Of Stock Exchange.

UNIT II:

Principles of Management: Management, Nature, Definition, Scope and Importance of Management. Evolution of Management Thought, Traditional Approach, Scientific Management, Behavioral Aspects, Systems Theory Of Organization, Functions Of Management – Planning, Organizing, Staffing, Directing, Coordinating, Controlling.

UNIT III:

Principles of Financial Accounting: Book-Keeping And Accountancy, Definition Of Accounting, Principles And Practices, Classification Of Accounts, Double Entry System, Books Of Prime Entry, Subsidiary Books, Recording Of Cash And Bank Transactions, Preparation Of Ledger Accounts, Preparation Of Trial Balance.

UNIT IV:

BRS and Final Accounts: Bank Reconciliation Statement, Problems Relating To Bank Reconciliation Statement. Bills Of Exchange, Drawing, Accepting, Renewal and Retainment of Bills Capital, Revenue And Differed Revenue Expenditure, Preparation of Trading And Profit And Loss Account And Balance Sheet of Sole Trading Concern.

UNIT V:

Financial Management: Financial Management, Nature, Scope And Objectives, Profit Maximization Vs. Wealth Maximization, Financial Analysis, Meaning and Objectives, Types And Techniques Of Financial Analysis.

TEXT BOOKS:
1. Bushan Y.K   :   Business Organization & Management
2. Prasad L.M   :   Principles Of Management
3. Koontz & O' Donell   :   Management A System Approach
4. Grawal T.S.   :   Introduction To Accountancy.
5. Jain&Narang   :   Financial Accounting**.**

BCA211	OBJECT ORIENTED PROGRAMMING WITH C++	CPP
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Identifiers and Keywords, Constants, C++ Operators, Type Conversion, Declaration of Variables, Statements, Simple C++ Programs, Input/Output Streams, if statement, if - e1se statement, switch Statement, for loop, while loop, do-while loop, break statement, continue statement, goto statement.

UNIT II
 Defining a Function, return Statement, Types of Functions, Actual and Formal Arguments, Local and Global Variables, Default Arguments, Multifunction Program, Storage Class Specifiers, Recursive Function, Preprocessors Header Files, Standard Functions. Array, Arrays and Functions, Multidimensional Arrays, Character Array. Pointer operator, Address operator, Pointer expressions, Pointer Arithmetic, Pointers and Functions, Pointers and Arrays, Pointer and one dimensional array, Pointer and multidimensional array, Pointers and Strings, Array of Pointers, Pointers to Pointers.

UNIT III
Classes, Declaration of Class, Member Functions, Defining the Object of a Class, Accessing a Member of Class, Array of Class Objects, Pointers and Classes, Nested Class, Constructors, Destructors, Inline Member Functions, Static Class Members, Friend Functions, Dynamic Memory Allocations, this Pointer. Inheritance, Types of Inheritances, function overriding, Constructors under Inheritance.

UNIT IV
Member Access Control, Function Overloading, Special features of function Overloading, Operator Overloading, Overloading assignment operator, Overloading of Binary Operators, Overloading arithmetic operators, Overloading of comparison 0perators, Overloading of Unary Operators. Polymorphism, Early Binding, Virtual Functions, Late Binding, Pure Virtual Functions, Abstract Base Classes, Virtual Base class, Template functions and template classes.

UNIT V
Exception Handling: Exception Handling classes, Exception Specification, Exception in classes. Data file operations: Opening & closing of files, reading/Writing a character from a file, Binary file operations, Classes & file operations, Random Access File processing.

TEXT BOOK:
- Object Oriented Programming with C++ Sixth edition, E.Balaguruswamy.
- A Structured Approach Using C++ By B.A.Forouzan & Rf Gilberg (Thomson Business Information India)
- Herbert Schilbt, C++ - The Complete Reference, TMH 2002
- J.P. Cohoon and J.W. Davidson, C++ program design – An Introduction To Programming and Object Oriented Design.- MGH 1999.

BCA212	**PROBABILITY AND STATISTICAL METHODS**	**PSM**
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Correlation and Regression: Correlation Coefficient, Bivariate Correlation, Karl Pearsons Formula, Rank Correlation, Regression. Linear Regression Equations, Regression Coefficient - Multiple-Correlation.

UNIT II
Analysis Of Categorical Data, Consistency of Attributes, Various Measures of Consistency Independence and Association of Attributes, Various Measures of Association, Yule's Association, Bowley's Association.

UNIT III
Hypothesis Testing: Concept of Statistical Hypothesis, Null and Alternative Hypothesis, Critical Region, Two Types of Errors, Level of Significance.
Hypothesis Tests for Means, Hypothesis Testing Using P-Values, Hypothesis Tests For Means, Difference of Means, Proportions, Difference of Proportions Using Large Samples and Confidence Intervals, Summary of Hypothesis Testing.

UNIT IV
Hypothesis Tests for Means, Hypothesis Testing Using P-Values, Hypothesis Tests for Difference of Means Using Small Samples. The Paired-Data Test and Confidence Intervals. χ^2 Tests for Variance, Goodness of Fit, Independency. Some Tests Based on F Distribution.

UNIT V
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 S
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)
7. CONTEMPORARY STATISTICS A COMPUTER APPROACH, S.P.GORDAN AND F.S.GORDAN(MCGRAW HILL1994)

BCA213	COMPUTER ORGANIZATION	CO
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Introduction Logic gates and circuits: Gates (OR, AND, NOR, NAND, XOR & XNOR); Demogran's laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map).

UNIT II
Data representation: Representation of Number, Binary, Octal, Hexadecimal number and its Arithmetic, Representation of Integers, Representation of Fractions, Representation of Character, Characters codes (ASCII), Binary Multiplication Division, Conversation of number in Decimal, Binary, Octal, and Hexadecimal.

UNIT III
Instructions and Flow of Control: Instruction formats**,** Types of Instruction**,** Types of operands**,** Addressing modes & Their Importance**,** Flow of Control**.**

UNIT IV
Processing Unit and Processors:
Instruction Execution and Parallel Instruction Execution, CPU organization. Processors: RISC vs CISC, The Motorola 680X0 Family, The Intel 80X86 Family, The Power PC Family

UNIT V
Computer Memory and Buses: Introduction to Computer Memory, RAM, ROM, Types of RAM and ROM, Memory Hierarchical structure, Cache Memory and Virtual Memory, Introduction to buses, Types of buses.

REFERENCE BOOKS:
1. Computer Organization, Tmh (Iv Edition) By V.C. Hamacher
2. Computer Organization, (Phi) By Moris Mano
3. Computer Architecture & Organisation By Hayes, (Tmh)
4. Computer Systems Organisation & Architecture By.Arpinelli,(Addison Wesley)
5. The Architecture Of Computer Hardware And Sytems Hardware By I Englander (Wiley)
6. Computer Sytems Design And Architecture By Vp Heuring, Hf Jordan (Pearson)

BCA214	OPERATING SYSTEM	OS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I

Introduction: What is an operating system? Mainframe Systems, Desktop Systems, Distributed Systems, Real Time Systems.

Computer-System Structures: Computer System Operation, I/O Structure, Storage Structure, Storage Hierarchy.

Operating System Structures: System Components, Operating-System Services, System Calls, System Programs, System Structure.

UNIT II

Processes: Process Concept, Process Scheduling, Operations on Processes, Co-operating Processes, Inter-Process Communication.

Threads: Overview, Multithreading Models, Java Threads.

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling.

UNIT III

Process Synchronization: Background, the Critical-Section Problem, Synchronization Hardware, Semaphores, Monitors.

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection.

UNIT IV

Memory Management: Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation.

Virtual Memory: Background, Demand Paging, Process Creation, Page Replacement Techniques, Thrashing.

UNIT V

File-System Interface and Implementation: File Concept, Access Methods, Directory Structure. File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

Mass-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, RAID Structure

Text-Books :
1. Applied Operating System By – Siler Schatz, Galvin
2. Operating Systems - By - William Stallings (V Edition)
3. Peterson J and Silberchez A: Operating System Concepts Wesley.
4. Batch J: The design of Unix OS, PHI
5. Book-Unofficial Guide to ethical hacking-By Ankit Fadia-MacMillan, ISBN

BCA215	BASIC WEB PROGRAMMING	BWP
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I

HTML**,** Browsers and their types, URL's, web sites, Domain Names, static and dynamic sites and active web pages, Files Creation, Web Server, Web Client/Browser Hyper Text Markup Language, HTML Tags, Paired Tags, Commonly used HTML Commands Titles and Footers, Paragraph Breaks, Line Breaks, Heading Styles, Drawing Lines, Text Styles, Other Text Effects, Indenting Text, Lists, Types of Lists.

UNIT II

Using the Border attribute, Using the Width and Height Attribute, Using the Align Attribute, Tables - Header, Data rows, The Caption Tag, Attributes - Width and Border, BGCOLOR, COLSPAN, ROWSPAN, External Document References, Internal Document References, Images as Hyperlinks, Introduction to Frames, tag, <FRAME> tag.

UNIT III

DHTML Introduction, use and its elements, Cascading Style Sheets – Introduction, Using Inline Styles, Sample Examples, Defining Your Own Styles, Properties in Values in Styles, A worked example, Formatting Blocks of Information, Layers, Embedded Style Sheets, Linking external sheets.

UNIT IV

JavaScript, Advantages, JavaScript Syntax, Data Types and Literal, Type Casting, Variables, Incorporating variables in a Script, Array, Operators and Expressions, Arithmetic Operators, Logical Operators, Comparison Operators, String Operators, Assignment Operators, Conditional Expression, Ternary and Special Operators, JavaScript Programming Constructs, If - then - else, Immediate If, For Loop, Built-in Functions, User Defined functions, Declaring functions, Place of Declaration, Passing Parameters, Variable Scope, Return Values, Recursive Functions, Placing text in a Browser, Dialog Boxes - Alert dialog box, Prompt dialog box, Confirm dialog box.

UNIT V

The Form Object, The Form Object's Methods, Text Element, Password Element, Button Element, Submit Button Element, Reset Button Element, Checkbox Element, Radio Element, Text Area Element, Select and Option Element, Multi Choice Select Lists Element, Other Built-In Objects in JavaScript - String, Math, Date Object, Creating a User Defined Object.

TEXT BOOKS:

1. Web Programming –Chris Bates – Third Edition.(Wiley)

2. Internet & World Wide Web- H. M. Deitel, P.J. Deitel, A. B. Goldberg-Third Edition

BCA221	DATA STRUCTURES WITH C++	DS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Introduction & Concepts of Data Structure: Definition, Data Types (Primitive, Non-Primitive), Type of Data Structures, Applications, Aims & Goals of Data Structure, Storage Representation of data in 1, 2 and Multidimensional Array and Sparse Matrix.

UNIT II
Searching and Sorting Techniques: Sequential search, Binary Search, Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort.
Linked Lists: Single Linked List, Double Linked List, Circular Linked Lists, Merits and Demerits of Linked Lists.

UNIT III
Linear Data Structures:
Stack: Basic Operations using array and linked list (Push, Pop, Display), Applications of Stack. Queue, Circular Queue: Basic Operations using array and linked list (Insert, Delete, Display), Concept of Priority Queue and Double Ended Queue, Applications of Queues.

UNIT IV
Trees: Introduction of Tree: Definitions, Basic Tree Terminology, Binary Tree, Full, Complete, in-complete, balance, imbalance**,** Memory Representations of Binary Tree (Array & Linked) and its merits & demerits of representations. Binary Search Tree, Properties of BST, Basic Operations on BST using liked list (Create, Insert, Search), Traversal algorithms: In order, pre- order, post order, Applications, Merits & Demerits of the trees**.**

UNIT V
Graphs: Introduction of Graph, Properties of graph & Terminology, Representation of Graphs, Graph Traversal Techniques (DFS & BFS), Applications of Graph.

References:
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.

BCA222	OPERATION RESEARCH	OR
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I
Linear Programming Problems: Formulation of Linear programming problem, Graphical solution and sensitivity analysis of a L.P.P. with two variables. Simplex method, Big-M method, Two Phase Method.

UNIT II
Transportation Problem: Principle of duality in linear programming problem, Dual simplex method. Transportation Problem, Initial Basic Feasible Solution by N-W corner rule, matrix minima method, Vogel's approximation method, optimal transportation solution, Balanced and unbalanced degenerate cases.

UNIT III
Assignment Problem: Definition and application of assignment problem, Hungarian Assignment Assignment Algorithm, unbalanced assignment problem, maximization case in assignment problem.
Travelling Salesmen Problem: Routing problem.

UNIT IV
Queuing Models: Concepts, applicability, classification, exponential distribution, Birth and Death process, poisson queues, single server, multiple server queuing models.

UNIT V
Sequencing of jobs: Problem of sequencing of 'n' jobs on 2 machines and problem of sequencing of 'n' jobs on 3 or more machines.
Scheduling by PERT/CPM: Basic concepts, constraints in network, construction of the network time, calculation, critical path method, PERT, PERT calculations.

TEXT BOOKS:
1. Operations Research : An Introduction - Hamdy.A Taha Phi.
2. An Introduction To Optimisation : Operations Research By J.C. Pant. (4th Edition) Jain Brothers New Delhi (1998)

REFERENCE BOOKS:
1. Operations Reserach By Kanthi Swaroop. P.K. Gupta, Manmohan.
2. Operations Research By P.K. Guptha, Manmohan,S.Chand & Company, Delhi-6
3. Introduction To Operations Research : A Computer Oriented Algorithmic Approach By Billy E.Gilett.
4. Engineering Optimisation By S.S.Rao New Age Internation (P) Limited.
5. Operation Research By G.V. Shenoy Etc., New Age International.

UNIT I
Introduction: Introduction to UNIX, Different Flavours of UNIX, Features of UNIX, Architecture of UNIX. Understanding the UNIX Command: Locating Commands, Internal and External Commands, Command Structure, Flexibility of Command Usage, man: Browsing the Manual Pages On-Line.
General Purpose Utilities: cal, date, echo, printf, bc, script, passwd, who, uname, tty, sty.
The File System: The File, What's in a (File)name?, The Parent-Child Relationship, pwd, cd, mkdir, rmdir, Absolute Pathnames, Relative Pathnames, ls.

UNIT II
Handling Ordinary Files: cat, cp, rm, mv, more, file, wc, od, cmp, comm., diff, gzip, gunzip, tar, zip, unzip.
Basic File Attributes: ls-l, The –d option, File Ownership, File Permissions, chmod, Directory Permissions.
The VI Editor: vi Basics, Input Mode, Saving Text and Quitting, Navigation, Editing Text, Undoing Last Editing Instructions, Repeating the Last Command, Searching for a pattern, Substitution.

UNIT III
The Shell: The shells Interpretive Cycle, Shell offerings, Pattern Matching- The Wild Cards, Escaping and Quoting, Redirecton: The Three standard Files, /dev/nul and /dev/tty: Two Special Files, Pipes, tee, Command Substitution, Shell Variables.
Simple Filters, Regular Expressions and Grep Family: The sample Database, pr, head, tail, cut, paste, sort, uniq, tr. grep, egrep, sed.

UNIT IV
Shell Programming: Shell Scripts, Read: Making Scripts Interactive, Command Line Arguments, Exit status of a command, The Logical Operators, Conditional Execution, Exit,, The if Conditional, The Case Conditional, expr: Computation, While, until, for, trap, Sample Validation.

UNIT V
awk – An Advanced Filter: Simple awk filtering, Splitting a line into fields, printf, The comparison operators, Number Processing, Variables, The –f Option, The BEGIN and END Sections, Built in Variables, Arrays, Functions, Control Flow Statements.
File Management: File Structures, System Calls for File Management – create, open, close, read, write.

TEXT BOOK:
1. Unix System Concepts And Applications By
   Sumithaba Das (Tata Mcgraw Hill)
2. Unix Net Work Programming By
   W.Richard Stevens(Phi/Addision Wesley Two Columes)

REFERENCE BOOK
1. Unix The Complete Reference By
   Rosen ,Host Farber And Rosinski-Tatamcgraw Hill
2. The Unix Programming Environment By
   Brian W. Kernigham& Rob Pike -Phi

BCA224	MANAGEMENT INFORMATION SYSTEM	MIS
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

UNIT I

Introduction to Management Information System (MIS) - Evolution - Defination - Role of MIS - Approches to Management - Models of Organisation Structure - Strategic Uses of Information Technology - Components of Information System.

UNIT II

Structure of Information System - Information System for Strategic Planing - Management Control and Operational Control - Applications of Tactical And Strategic Information System to Accounting and Finance, Marketing Production And Human Resources.

UNIT III

Decision Making Process - Intellegence Design and Choie - Structued and Un-Structured Decisions Theory - Decision Support System (DSS)

UNIT IV

Inventary Model- Capital Budgetting - Break Even Analysis - Decision Support System (DSS) Components – DSS And Major Business Functions.

(**NOTE:** Methods for Determing Alternatives Is Restricted to Concepts and Student is not Expected to Solve the Problems)

UNIT V

Planning and Developing Information Systems -MIS Planing Approaches - Interanl Problems Related to MIS - Pit Falls in MIS Development - Organisation for Mis - Centralization vs Decentralization.

REFERENCE BOOKS :

1. Robert Schultheis. Mary Sumner Management Information System : The Manager's View Tata Nc Graw Hill Publishing Company Limited, New Delhi.
2. W.S. Jawadeker ,Management Information Systems, Tata Mcgraw Hill Publishing Company Limited, New Delhi.
3. David Kroenke, Management Information Systems Tata Mcgrawhill Book Company.
4. Robert G.Mudrick. Joel Ross James, Clagget, Information System For Modern Management Prentice Hall Of India Private Limited, New Delhi.
5. Gordan A Davis Margrethe H. Olson,Management Information System Conceptual Foundations-Structure And Development Mc Graw Hill International Edition.

BCA225	SOFTWARE ENGINEERING	SE
WORK LOAD: 4 PPW	**INTERNAL MARKS: 30**	**EXTERNAL MARKS: 70**

Unit I
Introduction to Software Engineering: The Evolving Role of Software, Changing Nature of Software, Software Myths. A Generic View of Process: Software Engineering- A Layered Technology, a Process Framework, the Capability Maturity Model Integration (CMMI), Process Patterns, Process Assessment, Personal and Team Process Models.
Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, the Unified Process.
Software Requirements: Functional and Non-Functional Requirements, User Requirements, System Requirements, Interface Specification, The Software Requirements Document.

UNIT II
Requirements Engineering Process: Feasibility Study, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management.
System Models: Context Models, Behavioral Models, Data Models, Object Models, Structured Methods.
Design Engineering: Design Process and Design Quality, Design Concepts, the Design Model. Creating an Architectural Design: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design.

UNIT III
Object-Oriented Design: Objects and Object Classes, An Object-Oriented Design Process, Design Evolution. Performing User Interface Design: Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.
Testing Strategies: A Strategic Approach to Software Testing, Test Strategies for Conventional Software, Black-Box and White-Box Testing, Validation Testing, System Testing, The Art of Debugging.

UNIT IV
Product Metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.
Metrics for Process and Products: Software Measurement, Metrics for Software Quality.
Risk Management: Reactive Vs. Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, RMMM, RMMM Plan.

UNIT V
Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability, The ISO 9000 Quality Standards.

Text Books:
1. Software Engineering, A Practitioner's Approach- Roger S. Pressman,
2. Software Engineering- Somerville, Pearson Education

MODEL PAPER
Faculty of Computer Science
Bachelor of Computer Application (BCA)

Time: 3 hrs   **Total Marks: 70**

Section - A

1. **Answer the following**   **(5X4=20)**
   a)
   (b)
   (c)
   (d)
   (e)
   (Each question from each unit)

Section – B (5X10 = 50)

Answer all questions

   1.a)   UNIT-I

                (OR)
   b)   UNIT-I

   2.   a)   UNIT-II

                (OR)
   b)   UNIT-II

   3.   a)   UNIT-III

                (OR)
   b)   UNIT-III

   4.   a)   UNIT-IV

                (OR)
   b)   UNIT-IV

   5.   a)   UNIT-V

                (OR)
   b)   UNIT-V