

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS
DR. H. S. GOUR (CENTRAL) UNIVERSITY, SAGAR (M.P.)

Revised Structure & Syllabus of BCA
(w.e.f. from Session - 2010-2011)

BCA

Bachelor of Computer Applications
II Year (III & IV Semester Syllabus)



2010-2011

**DR. H. S. GOUR CENTRAL UNIVERSITY,
SAGAR (M.P.)**

**DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS
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Revised Structure of BCA Syllabus (w.e.f. from 2009-2010)

First Year (Semester – I)

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-111	Computer Fundamentals	3	-	-	03	40	60	100
CSA-C-112	Digital Principles	3	-	-	03	40	60	100
CSA-C-113	Fundamentals of Programming	3	-	-	03	40	60	100
CSA-C-114	Elements of Operating System	3	-	-	03	40	60	100
CSA-C-115	Financial Accounting	3	-	-	03	40	60	100
CSA-C-116	Software Laboratory- I (a)	-	-	3	01	40	60	100
CSA-C-117	Software Laboratory- I (b)	-	-	3	01	40	60	100
CSA-C-118	Elementary Mathematics	3	-	-	03	40	60	100
		18	0	6	20	280	420	800
	Total Load : 24				-	-	-	-

First Year (Semester – II)

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-211	PC-Soft wares	3	-	-	03	40	60	100
CSA-C-212	Microprocessor and Assembly Language Programming	3	-	-	03	40	60	100
CSA-C-213	Structural Programming (Using 'C')	3	-	-	03	40	60	100
CSA-C-214	Operating System	3	-	-	03	40	60	100
CSA-C-215	Computer Architecture	3	-	-	03	40	60	100
CSA-C-216	Software Laboratory- II (a)	-	-	3	01	40	60	100
CSA-C-217	Software Laboratory- II (b)	-	-	3	01	40	60	100
CSA-C-218	Advanced Mathematics	3	-	-	03	40	60	100
		18	0	6	20	280	420	800
	Total Load : 24				-	-	-	-

Second Year (Semester – III)

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-311	Discrete Mathematics	3	-	-	03	40	60	100
CSA-C-312	Statistical Methods	3	-	-	03	40	60	100
CSA-C-313	Business Data Processing Using 'COBOL'	3	-	-	03	40	60	100
CSA-C-314	Data Structure Using 'C'	3	-	-	03	40	60	100
CSA-C-315	Database Management and Design	3	-	-	03	40	60	100
CSA-C-316	Software Laboratory- III (a)	-	3	3	02	40	60	100
CSA-C-317	Software Laboratory- III (b)	-	-	3	01	40	60	100
		15	3	6	18	280	420	700
	Total Load : 24				-	-	-	-

Second Year (Semester – IV)

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-411	Numerical Analysis	3	-	-	03	40	60	100
CSA-C-412	System Analysis And Design	3	-	-	03	40	60	100
CSA-C-413	Object Oriented Programming	3	-	-	03	40	60	100
CSA-C-414	Visual Programming	3	-	-	03	40	60	100
CSA-C-415	Optimization Methods	3	-	-	03	40	60	100
CSA-C-416	Software Laboratory- IV (A)	-	3	3	02	40	60	100
CSA-C-417	Software Laboratory- IV (B)	-	-	3	01	40	60	100
		15	3	6	18	280	420	700
	Total Load : 24				-	-	-	-

Third Year (Semester – V)

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-511	Computer Graphics	3	-	-	03	40	60	100
CSA-C-512	Unix And Shell Programming	3	-	-	03	40	60	100
CSA-C-513	Software Engineering	3	-	-	03	40	60	100
CSA-C-514	Computer Networking	3	-	-	03	40	60	100
CSA-C-515	(A) Digital Image Processing	3	-	-	03	40	60	100
CSA-C-516	(B) Simulation & Modeling							
CSA-C-517	(C) Web Technology							
CSA-C-518	Software Laboratory- IV (A)	-	3	3	02	40	60	100
CSA-C-519	Software Laboratory- IV (B)	-	-	3	01	40	60	100
		15	3	6	18	280	420	700
	Total Load : 24				-	-	-	-

Third Year (Semester – VI)

Major Project based on curriculum at Industry

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-611	Major Project (External) Project / Dissertation – 300	-	-	-	06	-	-	300
CSA-C-612	Comprehensive Viva based on project / dissertation – 200	-	-	-	15	-	-	200
CSA-C-613	Seminar and Group Discussion (External)	-	-	-	06	-	-	200
	TOTAL	-	-	-	27	-	-	700
	GRAND TOTAL	-	-	-	147	-	-	4200

CSAC – SLN Example for course – CSACSLN
for elective course -CSAESLN

CSA – Computer Science and Applications

C – Core Course

E – Elective

S – Semester

L – Label (0 – Diploma, 1 – UG, 2 – PG, 3-M. Phil, 4- Ph. D.)

N – Paper Number

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BCA - I -YEAR (BCA - I - SEMESTER)
COMPUTER FUNDAMENTALS

CSA-C-111

Max. Marks: 60

- UNIT - I:** Briefs History of computer system, Computer system characteristic & capability: Speed, Accuracy, Reliability, Capability and Repeatability. Types of computer: Analog, Digital, Hybrid, General & Special Purpose Computer. Introduction of PC: The IBM personal computer system, type of pc system, Basic Component of Computer System Memory Control Unit, ALU, CPU, I/O Devices, Memory – RAM, ROM, PROM, EPROM, EEPROM and other type of memory.
- UNIT - II:** Introduction of Input Device: Keyboard, Mouse, Track Ball, Joystick, Digital-Camera, OMR, MICR, Bar-code Reader, Light pen, Touch Screen. Output Device: Monitor-characteristic and its type, Resolution, Refresh Rate, Dot pitch, Video Standard-VGA, SVGA, XGA, Printer and its types, Storage Device: Primary Vs. Secondary Storage, Retrieval Methods-Sequential, Direct & Index Sequential, Magnetic Tape, Magnetic Disk, Hard Disk.
- UNIT - III:** Data Processing: Data Processing System, Data Representation and Codes: Decimal, Binary, Octal, Hexadecimal, BCD, EBCDIC and ASCII code, Types of Software: System Software, Application Software, Assembler, Compiler, High-Level Languages, Virus Principal: Types of Virus, Virus Detection and Prevention, Virus on Network.
- UNIT - IV:** Analog and Digital Signals, Modulation-AM, FM, PM. Direction of Transmission-Simplex, Half Duplex, Full Duplex, Types of Connection-Dialup, Leased Lines, ISDN. Types of Network-LAN, MAN, WAN etc. Topology- Ring, Bus, Star, Mesh, and Tree.

TEXTBOOKS:

1. XavierC, "Introduction to Computers and BASIC Programming" New Age International.
2. V Rajaraman "Fundamentals of Computers" Second Ed, Prentice Hall of India.
3. Basandhara, S. K. "Computer Today", Galgotia Publication.
4. Sinha, P. K., "Computer Fundamentals", BPB.

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DIGITAL PRINCIPLES

CSA-C-112

Max. Marks: 60

UNIT - I: Boolean algebra, Boolean equation of logic gates, AND, OR, NOT, NOR and NAND gates, truth tables De Morgan's theorems, XOR, XNOR gates, Boolean laws and theorems, Duality theorem.

UNIT - II: Karnaugh map, Pairs, Quads and Octets, Karnaugh simplification, DONOT CARE condition, POS and, SOP methods, Grey code, Multiplexer and Demultiplexer, BCD to Decimal decoder, Seven segment decoder, Encoder.

UNIT - III: Arithmetic circuits, Binary adder circuits, Sign magnitude numbers, 2's complement, Arithmetic Addition, Subtraction, Adder subtraction Circuits, Half adder, Full adder.

UNIT - IV: Flip Flops, RS, D, JK, Master Slave, Shift registers, Types of shift registers, Asynchronous and Synchronous counters, Semiconductor memories, Memory cell and their organization. Memory addressing, ROM, PROMS, EPROMS, RAMS, DRAMS, SRAMS, Memory cells, A to D and D to A converters.

TEXT BOOKS:

1. Malvino A. P. & Leech, D. P. - "Digital Principles and Applications"- TMH
2. Malvino "Digital Computer Electronics" TMH

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FUNDAMENTALS OF PROGRAMMING

CSA-C-113

Max. Marks: 60

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- UNIT - I:** Program and Algorithm, Flowcharting, Requirements for solving problems using a computer, Problem definition phase, Problem solving strategies, Top-down design, Breaking the problem into sub problems. Choosing a suitable data structure, Construction of loops, Initial condition for loops, Iterative construct, Loop termination, Algorithm implementation, Modularity, Debugging, Program testing, and Efficiency of algorithm computational, Complexity, Worst, Average and Best behaviors.
- UNIT - II:** Pascal fundamentals, Structure of Pascal, Pascal character set, Reserved words, Identifier, Scalar and user defined data type, Statement and operators, Expression, Pascal syntax diagrams, Control structure, Procedures, Functions, Loop structures, IF, CASE and GOTO structure, Nested control structure.
- UNIT - III:** Arrays , One & Multi dimensional, Operations, Strings and string variables, Variable length array parameters, Records and files, Defining and processing a record, Defining, Creating and Reading a sequential file, Updating Sequential file, Text file, Printing output data.
- UNIT - IV:** List and Pointers: Introduction to list, Linked list and pointer, Pointer type definition, Variable declaration, Operation with pointer variables, Object variables, Dynamic variables, Creating and Destroying dynamic variables.
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TEXT BOOKS :

1. Gottfried, B. S. - "Programming using Pascal" TMH
 2. Dale, N. & Orshalick, D. - "Introduction to Pascal and structured Programming, TMH.
-

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BCA - I -YEAR (BCA - I - SEMESTER)
ELEMENTS OF OPERATING SYSTEM

CSA-C-114

Max. Marks: 60

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- UNIT - I:** Computer system overview, Basic elements, Processors registers, Instruction execution, Interrupt processing, Memory hierarchy, Cache memory, I/O communication techniques.
- UNIT - II:** Operating system, Objectives, Functions, Services, Resource Manager, Types of Operating system Serial processing, Batch system, Time sharing, Distributed, Operating system, Achievements of operating system.
- UNIT - III:** Process Description and Control, Process states, Two states, The creation and Termination of process, Five state, Control structure, Process attributes, Process Control.
- UNIT - IV:** Memory management, Relocation, Protection, Sharing, Logical organization, Physical organization, Loading programs, Fixed partitioning, Dynamic partitioning, Relocation, Simple paging, Simple segmentation, Loading & Linking.

TEXT BOOKS : 1. W. Stallings, "Operating System" - PHI

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BCA - I -YEAR (BCA - I - SEMESTER)
FINANCIAL ACCOUNTING

CSA-C-115

Max. Marks: 60

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- UNIT - I:** Meaning and scope of accounting, accounting principles, System of book keeping and accounting, Accounting concepts.
- UNIT - II:** Journalize transactions - Rules for debit and credit, compound Journal entry, Ledger posting, Sub division of Journal trial Balance.
- UNIT - III:** Capital and revenue items, final accounts, depreciation.
- UNIT - IV:** Share Capital - Shares, Issue of Shares & Debentures, Calls in arrears, Call in advance, for features of shares - simple problem.

TEXT BOOKS :

1. R. L. Gupta and V. K. Gupta. "Principles and practice of Accountancy"
2. S. M. Shukla, "Financial Accounting" Sahitya Bhawan Pub., Agra
3. S. M. Shukla, "Corporate Account" Sahitya Bhawan Pub., Agra.

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BCA - I -YEAR (BCA - I - SEMESTER)
SOFTWARE LABORTORY - I

CSA-C-116

Max. Marks: 60

Computer Hardware System

- (a) Explain the basic structure of computer system along with all elements.
- (b) What is Computer Memory? Explain it's various types and differentiate between them.
- (c) Explain the concept of Cache Memory? And it's importance.
- (d) Describe the structure of Hard Disk and explain how data can be read/write, from/ to hard disk .
- (e) Explain different types of I/O devices and their use.
- (f) Explain different devices used to provide power to a Computer System.

Dos Operating System

- (a) What do you mean by Operating System? Explain the basic function of OS.
- (b) What is Dos? Explain it's booting process.
- (c) Explain the concept of Internal and External Commands.
- (d) Explain the following internal commands of Dos along with syntax and example. CLS, Date, Time, Vol, Ver, Dir, MD, CD, RD, Copy , Type, Copy, Del/Erase, Ren, Prompt, Echo.
- (e) Explain the following External commands. Move, Help, Attrib, Sort, More, Tree, Xcopy, Diskcopy, Backup, Recover, Restore, Format, Unformed.
- (f) Describe the concept of file in Dos. Explain directory and sub directories.
- (g) Explain how a file can be print in Dos.
- (h) Explain how a non empty subdirectory can be removed.
- (i) Explain Config.Sys , Autoexe.bat and command .com files.

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BCA - I -YEAR (BCA - I - SEMESTER)
SOFTWARE LABORTORY - II

CSA-C- 117

Max. Marks: 60

Algorithm Development

- (a) Explain the concept of Program, Algorithm and flow chart.
- (b) Write an algorithm and draw a flowchart to input a number and check whether it is positive or negative.
- (c) Write an algorithm and draw a flowchart to calculate the area of circle.
- (d) Write an algorithm and draw a flowchart to calculate Simple interest if principle amount, rate and time is given.
- (e) Write an algorithm and draw a flowchart to calculate square and square root of a given integer.
- (f) Write an algorithm and draw a flowchart to input three numbers and then find the largest number among them.
- (g) Write an algorithm and draw a flowchart to generate N Fibonacci numbers.
- (h) Write an algorithm and draw a flowchart to input N numbers and calculate their sum.
- (i) Write an algorithm and draw a flowchart to find Factorial of a given number.

Programming in Pascal Language

Write a Pascal program for the following task

- (a) Convert degrees Fahrenheit to Celsius and vice versa.
- (b) Input three numbers and find the largest and smallest among them by using If-Else construct.
- (c) To sum the series comprising of even numbers by using while loop
 $2 + 4 + 6 + \dots + 100$
- (d) To find the sum of the digits of a given number by using repeat until loop.
- (e) To check whether the given number is prime or not by using for loop.
- (f) To find the Factorial of a given number by using for loop with down to do option.
- (g) To input two number and find their addition subtraction multiplication and division using case statement..
- (h) To print a multiplication table between 1 to 10.
- (i) To generate N Fibonacci numbers.
- (j) To input N numbers and then arrange them in ascending order.
- (k) To check whether a given string is a palindrome or not.
- (l) To read a matrix and find the sum of it's elements.
- (m) To find the cube of a given number by using procedure and function.
- (n) To illustrate the concept of records.
- (o) To illustrate the concept of files.

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BCA - I YEAR (BCA - I SEMESTER)
ELEMENTARY MATHEMATICS

CSA-C-118

Max. Marks: 60

UNIT - I: Definition and types of matrices, Operations on matrices, Ad-joint and Inverse of a matrix, Systems of homogeneous linear equations by using inverse of matrix. Determinants: their properties and solutions, Applications with examples. Complex numbers and their conjugates, Modulus, Important facts about complex number, their polar forms and square roots, locus of an arbitrary point $p(x + i y)$.

UNIT - II: Real functions and their relationship between degrees and radians, derivations of sine, cosine and tangents of angles in triangles, some exercises based on these ratios, determination of these ratios, inverse trigonometric functions and their determination, graphs of inverse functions.

UNIT- III: Differentiation derivative of a function, Differentiation of important functions, product and quotient rules of differentiation, n^{th} derivative, Applications of the derivatives – Motion in a straight line, Motion under gravity, Rate of change of quantities, Increasing and decreasing functions, Maxima and Minima.

UNIT - IV: Linear equation in two variables and its graph, system of two linear equations in two variables, Solution of the system of equations by graphical method.
Conic-section: General Equation of circle, Parabola, Ellipse, Hyperbola and its problems.

TEXT BOOKS :

1. Mathematics, A. Text Book for class XI, Pub. NCERT.
2. Mathematics, A. Text Book for class XII, Pub. NCERT.
3. Elementary Mathematics for Undergraduate students of Computer Science and Applications.

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BCA - I -YEAR (BCA - II - SEMESTER)
PC - SOFTWARE

CSA-C-211

Max. Marks: 60

UNIT - I: MS-Word: Introduction, Word Processing, Advantages of word processing, Creating, Saving and Editing a document: Selecting, Deleting, Replacing Text, Copying text to another file. Formatting Text and Paragraph: Using the Font Dialog Box, Paragraph Formatting using Bullets and Numbering in Paragraphs, Checking Spelling, Line spacing, Margins, Space before and after paragraph.

UNIT - II: Defining Tabs: using Ruler Bar, Mouse and Tabs Dialog Box. Enhancing a Document: Inserting page Breaks, Adding Border, Opening and Closing Toolbars, Using Header and Footers in the Document. Creating and Formatting Tables: Changing Row height, inserting columns, Merging cells Calculations in a Table, Sorting Text, Using Graphics, Using the Drawing Toolbar using word art, Mail merge: Definition, a Practical Example of mail merge, creating charts.

UNIT-III : MS Excel Introduction, Definition Excel Screen parts of worksheet, Entering information: Numbers, Formula, Editing Data in a cell, Excel functions, Using a Range with SUM, Moving and copying data, Inserting and Deleting Row and Columns in the worksheet, Using the format cells Dialog box, Using chart wizard to create a chart, Naming ranges, classification of Excel Functions, performing what if analysis with Data Table.

UNIT- IV: Protecting a workbook with Password, Macro: Recording and Running a Macro, Linking workbook files Using Pivot table, Inserting Hyper links, **POWERPOINT** : Introduction, Slide show, Formatting, Creating a Presentation, Inserting clip Arts, Adding Objects, Applying Transitions, Animation effects, formatting and checking text, Modifying Visual elements, Preparing a complete presentation, Case studies.

TEXT BOOKS :

1. R. K. TAXALI " PC Software for Windows 98, Made Simple" TMH.
2. Will Train, Gini Corter, Annette Marquis "Microsoft Office" BPB.

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MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING

CSA-C-212

MAX. MARKS: 60

UNIT - I: Microprocessor based personal system: - Microprocessor, organization of microprocessor system Microprocessor Instruction set and computer language:- machine language, 8085 machine language, 8085 assembly language , ASCII code, High level language, Operating system: MS DOS, Microprocessor Architecture: System bus, Assembler, Compiler, memory and I/O System, Programming model of Intel 8085 and 8086.

UNIT - II: Real memory addressing mode ,Protected addressing mode, Data addressing mode, program memory addressing mode, stack memory addressing mode, load effective address, string data transfer, input and output instruction.

UNIT - III: Arithmetic and Logic Instruction: - Addition, Subtraction, Multiplication and Division, comparison, BCD and ASCII arithmetic:-DAA, DAS, AAA, AAD, AAM, AAS. Basic logic Instruction:-AND, OR, NOT, Test Shift and Rotate Instruction, String comparison

UNIT - IV: Programming technique: - Looping, counting and indexing with flow chart, Program control, instruction: Jump group instruction (Do-While, Repeat until, Designing procedure:-CALL, RET, Interrupt and interrupt handler, controlling the carry flag bit, STC, CLC, CMC, WAIT, HLT, NOP, LOCK, ESC, BOUND.

TEXT BOOKS :1. Brey, B. B" The Intel Microprocessor 8086/8088/80186/80188, 80286, 80386, 80486, Pentium and Pentium pro processor" PHI
2. " - Ramesh S.Gaonkar, "Penram International".

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BCA - I YEAR (BCA - II SEMESTER)
STRUCTURAL PROGRAMMING (USING 'C')

CSA-C-213

MAX. MARKS: 60

UNIT-I: Introduction & features of C, Structure of C programs, *C Tokens*: Character Set, identifiers, keywords, constants, string, *Operators* Arithmetic, Logical, relational, Increment, Decrement, Assignment, Conditional and Bitwise operators, Precedence and Associativity of operators. Data type, Escape sequence, header files.

UNIT - II: Single Character Input/Output: getch(), getche(), getchar(), putchar(). Formatted I/O: printf(), scanf(). Control Structures: Decision control structure: if, if-else, else if ladder, nested if. Loop control structure: Loops, while, do...while, for, nested loop, break and continue statements, Case control structure: switch, goto statement. Array: Single and multidimensional arrays, array declaration and initialization of Arrays, Passing array to a function.

UNIT - III: Function: what is a function, why use function, library functions, user-defined functions, function declaration and prototype, actual and formal parameters, call by value and call by reference. Recursion String: declaration, initialization, standard, library string functions. Union and Structure: defining structure, declaration of structure variable, accessing structure members, nested structure, Array of structure, structure assignment, passing structure in to function and return structure from function. Scope and life of variables: local and global variables.

UNIT - IV: Pointers: pointer notations, operations on pointer, pointer declaration, array of pointers. File management: creating, opening and processing data files. Disk Input/Output function: fscanf(), fprintf(), tell(), putw(), getw(), putc(), getc(), seek().

TEXT BOOKS: 1. Yashwant Kanitkar, 'Letus C', BPB New Delhi
2. Balaguruswami, 'Ansi C', TMH, Delhi

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Dr. R. K. Pathak

Mr. Arvind Deshmukh

Dr. Sanjay Thakur

Smt. Shweta Ojha

Mr. Virendra Tiwari

Dr. Saurabh Jain

DR. H. S. GOUR (CENTRAL) UNIVERSITY, SAGAR (M.P.)
BCA - I YEAR (BCA - II SEMESTER)
OPERATING SYSTEM

CSA-C-214

Max. Marks: 60

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- UNIT - I:** Unprocessed scheduling, Types of Scheduling, Scheduling algorithms, Scheduling criteria, Concept benefits of Virtual memory, Characteristics of Paging and Segmentation, Page table structure, TBL, Operating policies for virtual memory, Fetch policy, Placement policy, Replacement policy, Resident set management, clearing policy, Load I/O management.
- UNIT - II:** I/O devices, Organization of I/O function, The evolution of the I/O function, Characteristics of I/O channels. OS design issues, Logical structure of I/O, function, I/O buffering, Disk I/O & Disk performance parameters and Disk scheduling policies.
- UNIT - III:** File management: Files, File Management Systems, File system architecture, Function of file management, File organization and access, File directories, File sharing, Record blocking, Secondary storage management, File allocation and its methods, Free space management .
- UNIT - IV:** Concurrency and synchronization, Principles of concurrency, Operating System concerns, Process interaction, Requirement for Mutual Exclusion, Mutual Exclusion Software Applications, Decker's algorithms, Peterson's algorithms, Mutual Exclusion Hardware support, Semaphore, Monitors, Deadlock, Condition for deadlock, Deadlock Prevention, Deadlock detection, Deadlock avoidance ,Implementation, Deadlock Avoidance algorithms.

TEXT BOOKS: 1. W. Stallings "Operating Systems," PHI

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BCA - I YEAR (BCA - II SEMESTER)
COMPUTER ARCHITECTURE

CSA-C-215

Max. Marks: 60

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- UNIT - I:** Structure and Function, The Computer System: Computer Components, Computer Function, instruction Fetch and Execution Cycle, Interrupts and the Instruction Cycle, Interconnection structures, Bus interconnection, PCI Bus.
- UNIT - II:** Computer Memory System and their characteristics, Semiconductor Memory: Main Memory organization: dynamic RAM static RAM, ROM, Chip packaging, error correction, cache memory principles.
- UNIT - III:** External memory: Magnetic disk and its read and write mechanism, physical characteristics, Disk performance parameters, RAID, optical memory: compact Disk, Digital versatile Disk, Magnetic Tapes.
- UNIT - IV :** Input/ Output - External devices, I/O module, Programmed I/O and Interrupt driver I/O. Direct Memory Access, I/O channels and processors, External Interface.

TEXT BOOKS: 1. Stallings Williams "Computer Organization and Architecture" -, PHI

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DR. H. S. GOUR (CENTRAL) UNIVERSITY, SAGAR (M.P.)
BCA - I -YEAR (BCA - II - SEMESTER)
SOFTWARE LABORATORY - II

CSA-C-216

Max. Marks: 100

(A) MS-OFFICE

- (a) Define page size and margins for a document.
- (b) Insert graphics (a picture for example) in a document.
- (c) Prepare a table of price list for display in a shop.
- (d) Prepare your bio-data in one A-4 size page.
- (e) Prepare a document with at least three fonts and four different font sizes. Include superscript and subscript.
- (f) Prepare a document where you should use special mathematical symbols like integration, sigma etc.
- (g) Prepare a document with footnote and bullet points.
- (h) Explain the use of spell check.
- (i) Explain the role of macros and templates.

(B) MS POWER POINT

- (a) Prepare a presentation (three to five slides) to identify yourself.
- (b) Prepare a presentation to give information about how to get admission to BCA in your institution.
- (c) Prepare a presentation to show infrastructure about your department/Institution.
- (d) Insert a slide in a slide show.
- (e) Change slide layout color and background.
- (f) Apply design templates.
- (g) Apply animation and slide transition.
- (h) Set timing for the display of the presentation.
- (i) Develop a slide show to explain the important features of power point.
- (j) Prepare a presentation to give information about top ten software companies (In India / world).

(C) MS EXCEL

- (a) Open a work sheet, name it and save it.
- (b) Change the width of a column/ range of columns.
- (c) Enter text and change its size and font in a cell.
- (d) Delete/insert a row/ column in a worksheet.
- (e) Erase a range/ full worksheet.
- (f) Fill a range of columns from n to k in steps of s.
- (g) Create a table and use it to create and display graph/chart.
- (h) Explain the use of @ functions.
- (i) A company XYZ limited Sagar prepares a pay slip for his company employees. Every employee gets DA @ 40% of basic pay if salary is less than 5000 else gets 30% of basic pay as DA. House rent allowance is 15% of total pay (basic + DA) if total pay is up to 10,000 else house rent allowance 10%. Income tax deduction

is 25% of total pay if above Rs 15,000 else zero. Compute take home salary of all employees. Check for all possible cases.

- (j) A shopkeeper gives a bill of the new items purchased. Prepare a worksheet to prepare the bills. The columns are SN, Item Name, Item Code, Unit Price, Cost, Total cost. The shopkeeper gives a cash discount of 5% if the total amount is Rs 5000 and above.

ASSEMBLY LANGUAGE (AL) PROGRAMMING

- (a) Write AL program to load all the 16 bit registers with 0.
(b) Write AL programs to load all 8 bit registers with data FA.
(c) Store your name in successive memory locations starting from 01234 memory location. Use the ASCII code.
(d) Write a complete program to interchange the values of two register using stack.
(e) Write a program that adds the contents of all 16 bit registers and stores the result in a 32 bit register.
(f) Write a program to store the values ABCD and EFGH into successive memory locations. Add the result and store it into next successive memory location.
(g) Store a set of 5 pairs of byte of data (roll no and marks) into successive memory locations and find the sum and average of five marks. Store the sum in AX and average in BX.
(h) Load the register AX with 0 by using logic instructions only.
(i) Write a program to multiply the contents of BX by 10. Using shift operations.
(j) Write a program to sum the content of block1 and block2 and store the result in block3. Block1 starts at memory address 12340 and block2 starts at memory address 12400 and block3 starts at memory address 13400. The block size is 10 bytes.

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SOFTWARE LABORATORY - II

CSA-C-217

Max. Marks: 100

PROGRAMMING IN 'C'

- (a) A shopkeeper sells soap cakes at the price of Rs 20. The purchase price is Rs 15. Write a program to calculate the selling price of x soap cakes and the profit he earns on selling x soap cakes.
- (b) Write a program to read a length l in cms and compute the total area of the disk of radius l, surface area of a sphere of radius l, surface area of a regular cylinder of radius l and length l and the surface area of a right pyramid of radius l and height l.
- (c) Write a program to input three integer lengths and find whether a triangle can be formed or not.
- (d) Input an integer number, check that it is non zero positive and find whether it is a Fibonacci number.
- (e) Write a program to print n th prime number for $n > 0$. The first prime number is 3.
- (f) Write a program in C to input three points (x,y), (p,q) and (m,n) and determine whether they are co-linear.
- (g) Input two matrices A and B. Check whether they are of equal dimensions, if yes then find sum of all elements of A, sum of all the elements of B and sum of all elements of A+B. Output the largest value of the three sums.
- (h) Write a program to input two matrices A and B. Check whether they can be multiplied, if yes multiply them and print the AxB in the matrix form. Print BxA also and check whether $AxB = BxA$ or not. Display the result.
- (i) Write a program to check whether a character string is a palindrome or not. (A palindrome reads same in both directions, e.g. abba, 123321, Malayalam etc.)
- (j) Write a program to read a sentence. Determine the average length of words in the sentence.

MINI PROJECT (Instructions :)

1. For all the mini projects mentioned below an input screen should be developed for inputting the data and a proper format of the screen should be designed for showing the output or results.
2. The screens should be very user friendly and all relevant data/information should be available for the data entry personal and for the end user.
3. All necessary/ required data should be assumed by the programmer.
4. Good Growth bank accepts deposits for one year or more and the policy it adopts on interest rates is as follows (i) If a deposit is less than Rs 1000 and for 2 or more years the rate of interest is 5% compounded annually.
5. If a deposit is Rs 100 or more but less than Rs 5000 and for 2 or more years the interest rate is 7% compounded annually. If a deposit is more than Rs 5000 and is for 1 year or more the interest is 8% compounded annually. On all deposits

for 5 years or more interest is 10% compounded annually. On all other deposits not covered by the above conditions the interest rate is 3 % compounded annually. Develop a mini project to ask the user to enter his relevant details like name etc. Ask the user to input amount and period and produce an output showing the Name, Account Number, amount deposited, date due and the amount payable on that due date.

6. Develop a calculator type program to input two values and ask the user whether he wants their sum, product, difference or multiplication and print the result correspondingly. Do not forget that division by zero is not permissible.
7. A certain steel bar is graded according the results of the following five tests. The tests are
 - (a) Carbon content $< 0.7\%$
 - (b) Hardness > 50
 - (c) Tensile strength $> 30,000$ Kilo/sq. cm.
 - (d) Uniformity of radius $< 1\%$
 - (e) Density > 4700 kilogram/cubic meter.

For passing all tests the steel is graded as grade 1. If one test fails the steel is graded as grade 2, if two tests fail then the steel is graded as grade 3 and so on.

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BCA - I -YEAR (BCA - II - SEMESTER)
ADVANCED MATHEMATICS

CSA-C-218

Max. Marks: 60

UNIT - I: Integral: Integral as an anti derivative, integration by substitution, integration using trigonometric identities, special integrals, integration by parts, integration by successive reduction.

UNIT - II: Definite integrals: definite integral as a limit of a sum, fundamental theorems of calculus, evaluation of definite integrals by substitution, properties of definite integrals, area of bounded regions.

UNIT - III: Differential equations introduction, differential equations, order and degree, formation of differential equations, solution of differential equation, equations with variable separable, homogeneous equations, first order linear equations.

UNIT - IV : Vectors, positional vector of a point. Components of a vector operation with vectors, scalar multiplication, addition, scalar product and vector product of two vectors. moment of a vector, scalar and vector triple product.

TEXT BOOKS : The text books on mathematics BY THE CBSE FOR Class XI & XII should be taken as the basis of study.

1. Intermediate Algebra - M. Roy, Shri Lal Agrawal and Company, Agra.
2. The Elements of co-ordinate Geometry, part I. S. L. Loney, Macmillan.
3. Text book on differential Calculus - Gorakh Prasad. Pothishala Private Limited Allahabad.
4. Text book on Integral Calculus and elementary differential equations - Gorakh Prasad, Pothishala Private Limited, Allahabad.

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BCA - II -YEAR (BCA - III - SEMESTER)
DISCRETE MATHEMATICS

CSA-C-311

Max. Marks : 60

UNIT - I : Connectives, logical capabilities of languages, Tautologies, Equivalence of formulae, Duality Law, Different normal forms, Predicates, Predicates Formulae, Free and Bound Variables, Universe of discourse.

UNIT - II : Inclusion and equality of sets, Ordered pair and n-tuples ,Cartesian Product, Binary relation in a set, equivalence and Compatibility relations, Partial Ordering, Composition of Functions, inverse function, Hashing function, Recursive Function.

UNIT - III : Algebraic system, Semi group and Monoid, Grammar and Languages, Sub-group, Polish Notation, Homomorphism, Group codes, Lattice as partially ordered set, BOOLEAN Algebra, Boolean Function.

UNIT - IV : Basics of Graph Theory, Vertex, Edges, Circuit, path and connectedness, matrix representation of Graph, Tree, Labeled tree, Spanning tree, List structure and graph.

TEXT BOOKS : Discrete Mathematical Structure with applications - Trimbley J.P. and Manohar R. - TMH, New Delhi.

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BCA - II -YEAR (BCA - III - SEMESTER)
STATISTICAL METHODS

CSA-C-312

Max. Marks : 60

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- UNIT - I :** Sample space and probability events and probability, axioms, probability and independence, Bays theorem with applications, Bernoulli trails, concept of random variables with definition and example
- UNIT- II :** Discrete random variables, probability mass function and distribution function, Bernoulli Binomial, Poisson, Geometric Negative Binomial distributions with properties. Independence of random variables and probability generating functions. Continuous random variables, probability density functions, properties of Hypo exponential, Erlang, Gamma Hyper exponential normal and truncated normal distributions.
- UNIT - III :** Functions of normal random variables, Joint distribution Mixture distribution and conditional expectation. Reliability failure density, hazard function Imperfect fault coverage with reliability, Parameter estimation in inference, properties of estimators, method of moments and maximum likely hood with uses.
- UNIT - IV :** Least square theory, Fitting of lines and curves scatter diagram Coefficient of determination, concept of correlation and correlation coefficient with examples, correlation analysis Rank correlation linear regression, confidence interval of regression, simple non-linear regression.

TEXTBOOKS:

1. Trivedi K. S. "Probability and Statistics with Reliability, Queuing and Computer Science Applications " PHI
2. Meyer, P. L. "Probability theory and Statistical Applications" IBH, Oxford, New Delhi -1980.

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BCA - II -YEAR (BCA - III - SEMESTER)
BUSINESS DATA PROCESSING USING COBOL

CSA-C-313

Max. Marks : 60

-
- UNIT - I :** Structure of a COBOL program character set, COBOL word, Data names, literals, figurative constants Identification and environment division, Data division, Level Structure Data description, File working storage.
- UNIT - II :** Procedure division, Data movement, Arithmetic verbs, sequential control verbs, Input and output verbs, conditional verbs, Usage, justified, redefines, renames, clauses; Data movement verbs and arithmetic verbs, move, add subtract computer condition and sequence control verbs.
- UNIT - III :** Table handling, occurs clause, assigning values to tables, multidimensional tables, perform verb with different options, Indexed tables and indexing sets, Search and sort of tables, sorting a table.
- UNIT - IV :** File handling, File characteristics record, block, buffers, sequential files, file description, operations on sequential files, report writer.

TEXT BOOKS : 1. Roy & Dastidar "COBOL programming" - TMH
2. Welburn " Structured COBOL: Fundamentals and style" TMH

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BCA - II -YEAR (BCA - III - SEMESTER)
DATA STRUCTURE USING 'C'

CSA-C-314

Max. Marks : 60

UNIT - I: List, Stack and operations, stack as an array, queue and implementation, circular queue. Applications of queue linked list pointers, dynamic memory allocation linked stack, linked list in array abstract data type.

UNIT - II: Searching, sequential and binary search decision tree, big O notation, Triangular, Jagged and inverted tables, Table as ADT. Hashing, Sorting, Insertion, Selection Shell, Merge and Quick sort.

UNIT - III : Recursion, divide and conquer tower of Hanoi, Generating permutations, back tracking Non attacking queens, game tree Binary tree, Tree search, tree traversal, tree sort, Binary search tree, AVL trees, Heap sort.

UNIT - IV : Ordered tree, Forest and Orchards, Tries, graphs, Computer representation, graph traversal depth first, Breadth first, Greedy algorithm, Graph as data structure.

TEXT BOOKS :

1. Kruse, Leung and Tando "Data structure and Program Design in C" PHI

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BCA - II -YEAR (BCA - III - SEMESTER)
DATABASE MANAGEMENT AND DESIGN

CSA-C-315

Max. Marks : 60

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- UNIT - I:** Database System & Evolution of Database technology. Database and Data sharing, planning, Management control Risks and cost of database logical and physical data representation, Database development.
Database design- Conceptual design objects and relationships, conceptual data models, Aggregation. Conceptual and Physical Objects.
- UNIT - II :**Relational data model - system development and concepts. Normalization process conceptual model to relational model.
Relational algebra, relational implementation with SQL, Schema and table definition Data manipulation, view queries. Relational implementation with graphical query language Data manipulation.
- UNIT - III :**Physical Database System- Physical, storage media, Disk performance factors Data storage format file organization and addressing methods implementing logical relationship. Mapping Logical data structure to Physical data structure, Query optimisation.
- UNIT - IV :** Managing the Data base environment - Database administration and Control DBA functions, goals, integrity security and recovery. DBMS selection and implementation, Need analysis, DBMS functions and capabilities evaluation and Implementation.

TEXT BOOKS :

1. Hansen G. W. & Hansen J. V. "Database Management & Design" - PHI.

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BCA - II -YEAR (BCA - III - SEMESTER)
SOFTWARE LABORATORY - III

CSA-C-316 & 317

Max. Marks : 100

UNIT - I : Software problems related to Discrete Mathematics

UNIT - II : Statistical problems

UNIT - III : Programming using COBOL

UNIT - IV : MINI PROJECT (B3) (C / COBOL/ DBASE)

Students shall be working on a mini project

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BCA - II -YEAR (BCA - IV - SEMESTER)
NUMERICAL ANALYSIS

CSA-C-411

Max. Marks : 60

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- UNIT - I :** Errors in Numerical calculations. Numbers and their accuracy, errors, and error formula. Error in Series approximation. Solution of Algebraic and transcendental equations Bisection method, iteration method, False position method, Newton Raphson method. Root squaring method. Non linear equation Newton's iteration method, Newton Raphson method.
- UNIT - II :** Interpolation - Finite difference, Newton's formula for interpolation, Central Difference interpolation formulae, Interpolation with unevenly spaced points, Divided difference formula, interpolation by interaction, Inverse interpolation.
- UNIT - III :** Curve fitting, least square procedures, weighted least square linear and non-linear. Numerical differentiation numerical integration Trapezoidal rule, Simpson's 1/3 rule, 3/8 rule, Numerical evaluation.
- UNIT - IV :** Matrices and Linear system of equations, metric operation, solution of linear system - direct method, iterative method.

TEXT BOOKS :

1. Sastry "Introductory Methods of Numerical Analysis" - PHI

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BCA - II -YEAR (BCA - IV - SEMESTER)
SYSTEM ANALYSIS AND DESIGN

CSA-C-412

Max. Marks : 60

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- UNIT - I:** System concept, definition, characteristics, organisation, interaction elements of system physical and abstract system open and closed system development life cycle recognition of need, feasibility study analysis, design implementation system planning and control for system success.
- UNIT - II:** System planning and Initial Investigation base for planning system dimensions of planning in determining users requirement fact finding, determination of feasibility tools of structured analysis, logical and physical models, context diagrams, data flow diagrams, data dictionary, data structure diagrams, system structured charts, system model.
- UNIT - III:** Feasibility study, system, system performance constraints system objectives, feasibility report. Costs benefit analysis, data analysis, and system proposal.
- UNIT - IV:** Systems design - logical and physical design, design methods IPO and HPO charts audit consideration, processing controls data validation. System testing & implementation-introduction & need of testing, types of testing, implementation: introduction, post implementation review, maintenance, Document writing
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TEXT BOOKS :

1. E.M.Awad, "System Analysis and Design", Galgotia.
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BCA - II -YEAR (BCA - IV - SEMESTER)
OBJECT ORIENTED PROGRAMMING

CSA-C-413

Max. Marks : 60

-
- UNIT - I:** Introduction to OOPS and C++, C++ program, variables. Manipulators, operators, FOR loop, WHILE, DO, If, Break and Continue statement. Ternary & Logical operator, structure and enumerated data types, Numeric and string arrays. 2D array.
- UNIT - II:** Functions, passing of parameters argument and address, overloaded and inline functions, friend functions, static functions, function argument. Storage class. Object and class constructor., stack class, string as a class, random number generator.
- UNIT - III :** Overloaded operators, binary operations on class data. Joining strings, overloaded relational operator, type conversion-class to basic, basic to class, class to class. Inheritance multiple inheritance, pointers and arrays, passing by pointer sorting using pointers in string handling, pointers to objects, linked list.
- UNIT - IV :** File handling, string handling, set and put functions, disk files file handling with multiple objects, pointers disk manipulators redirection graphics, text processing, functions, colors shapes, animated shapes texts in graphics mode virtual function,.

TEXT BOOKS :

1. R. Rajaram "Object Oriented Programming and C++ "-
2. R Lafore " Object Oriented Programming":
3. E.Balaguruswami"OOps"-TMH

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BCA - II -YEAR (BCA - IV - SEMESTER)
VISUAL PROGRAMMING

CSA-C-414

Max. Marks : 60

-
- UNIT 1 :** Introduction of Visual Basic-Features of VB , IDE, Toolbox controls, Object Naming Conventions, events, methods and properties, Data Types in VB, Variables, constants Operators, Manipulating forms: loading, showing and Hiding forms form event.
- UNIT 2 :** Visual Basic Control Structures: Selection constructs/Decision Structures-If, select-case, Looping Structures-For, do while, do...loop while, for Each...Next, While...Wend, Nesting loops, Exiting from loops, with. end with, Arrays, Dynamic Arrays. Procedures- Types of procedures, Passing parameters to procedures, Exiting from procedures, Code Modules- Form modules, Standard Modules, Class Modules, Scope and lifetime of Variables.
- UNIT 3 :** Library Functions-String functions, Numeric Functions, Date & Time functions, Miscellaneous functions, VB Interface Styles- SDI, MDI. VB Menues, Status bar, Tool bar, Tree View, List View, Rich text box control, MS Flex Grid, DT Picker, Database Programming- Data controls, ADO data control, OLE DB.
- UNIT 4 :** Accessing Database Using ADO DC- Extracting Selected Data, Navigating the Record set, Modifying Database through Record set, DSN, Providers Data Environment, Data Report, Error Handling in Visual Basic- Types of Error Handling Errors, Debugging Tools in VB, Package & deployment Wizard.
-

TEXT BOOKS :

1. Sheriff, A. "Visual Basic 6" PHI.
 2. Burrows, William E. "Programming Business Applications with VB" TMH.
 3. Sengupta & Chaudhari "Object Oriented Programming & Fundamentals" PHI
 4. Donald & Oancea "Visual Basic" PHI
 5. Rumbaugh, J. "Object Oriented Modeling and Design" PHI
 6. "Mastering in Visual Basic 6" BPB
 7. Wrights, P. "Beginning Visual Basic 6" SAP (WROX)
 8. Mckelvy, M. "Visual Basic Desk Top applications" BPB.
 9. MCSD "Visual Basic 6 Desktop Applications" TMH.
 10. Jung "Visual Basic Annotated Archives" TMH.
 11. Murach's Visual Basic 6
-

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BCA - II -YEAR (BCA - IV - SEMESTER)
OPTIMIZATION METHODS

CSA-C-415

Max. Marks : 60

UNIT - I: Scope of operations research, Formulation of Simple Linear programming problems, Graphical Method, Simplex Method, Two Phase Method.

UNIT - II: Primal and Dual LPPs, Dual Simplex Method, Assignments Problems, Transportation Problem, Transportation with Transshipment.

UNIT - III: Sequencing Problems: Problems of n Jobs and 2 machines, Two jobs on ordered m machines. Network Analysis: Minimal Spanning Tree, Shortest Path Problem,

UNIT - IV: Integer programming, Dynamic programming, Non linear programming: Quadratic programming, Separable programming .

TEXT BOOKS :

1. H. S., Kasana and K. D. Kumar, "Introductory Operations Research" Springer International Edition, Berlin (Germany) First Edition 2004.
2. H.A., Taha, "Operations Research: An Introduction", Seventh edition, Prentice Hall of India, New Delhi 2004.

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BCA - II -YEAR (BCA - IV - SEMESTER)
SOFTWARE LABORATORY - IV

CSA-C-416 & 417

Max. Marks : 100

UNIT - I : PROBLEMS BASED NUMERICAL ANALYSIS

UNIT - II : PROBLEMS BASED ON OBJECT ORIENTED PROGRAMMING

UNIT - III : PROBLEMS BASED ON OPTIMATION METHODS

UNIT - IV : MINI PROJECT (B4) (C++ / DBASE)

Note: Students should be asked to perform practical based on the above four units.

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BCA - III -YEAR (BCA - V - SEMESTER)
COMPUTER GRAPHICS

CSA-C-511

Max. Marks : 60

-
- UNIT - I:** Introduction to Computer Graphics, Types of refresh graphics displays, CRT Raster Scan basics, Video Basics, Interactive input and output Devices, Raster scan graphics, Line drawing algorithms, Bresenham's algorithm, Scan Conversion, polygon filling.
- UNIT - II:** Clipping- 2D clipping, line clipping algorithms Cyrus-Beck algorithm convex polygon & inward normal, concave clipping, 3D clipping, midpoint subdivision algorithm Cyrus-Beck algorithm, Homogeneous co-ordinate clipping, concave clipping character clipping.
- UNIT - III:** Hidden line and Hidden surface algorithms- Floating horizon, Roberts-Warnock, Weiler-Atherton-Subdivision-Z-buffer, Scan lines - spanning scan line- racy tracing algorithm..
- UNIT - IV:** Rendering, illumination model, surface normal, reflection vector, shading, transparency, shadows, texture, ray tracing, color.

TEXT BOOKS :

1. Asthana R. G. S. and Sinha N. K. "Computer Graphics"
2. Haren and Becker " Computer Graphics" PHI

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DR. H. S. GOUR (CENTRAL) UNIVERSITY, SAGAR (M.P.)
BCA - III -YEAR (BCA - V - SEMESTER)
UNIX AND SHELL PROGRAMMING

CSA-C-512

Max. Marks : 60

-
- UNIT - I:** Unix Operating System – the kernel structure, Files and commands, directories, shell, The file system basics, directories and file names, permissions, inodes, devices, Introduction of Unix Editors including- nroff, troff.
- UNIT - II:** Unix file system commands: cat ,cp, mv, rm, hard and soft links, wc, chmod, chown Shell, command line structures, creating new commands, I/O redirection Pipes and Filters, grep family, stream editor(sed), pattern scanning and processing language awk.
- UNIT - III:** Shell programming- Shell scripts, The Bourne, Korn and C shell, Shell variables and shell scripts, meta characters and environment variables, arguments and parameters, Conditional statements and loops of both shells.
- UNIT - IV:** UNIX system calls. I/O file system, processes, signals and interrupts. System Administration in UNIX: User management process management device management.

TEXT BOOKS :

1. Y. Kanitker "Unix Shell Programming"- BPB.
2. Maurice Bach " The design of the Unix Operating System" PHI

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BCA - III -YEAR (BCA - V - SEMESTER)
SOFTWARE ENGINEERING

CSA-C-513

Max. Marks : 60

-
- UNIT - I :** Software as a product, Software characteristics and components, software process models, linear prototype and RAD models, Evolutionary models formal methods model.
- UNIT - II :** Software process and project matrices, Software measurement, metric for software quality. Software project scheduling and tracking. task set for software project, scheduling the task.
- UNIT - III :** Software analysis concept and principles, modeling, partitioning specifications, software design process, principles and concepts, design concepts, modular design.
- UNIT - IV :** Software testing methods, basis path testing, control structure testing, black and white box testing, Testing GUI and Client - server architecture.

TEXT BOOKS :

1. Pressman R. S "Software Engineering a Practitioner's Approach." - McGraw Hill.

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BCA - III -YEAR (BCA - V - SEMESTER)
COMPUTER NETWORKING

CSA-C-514

Max. Marks : 60

UNIT - I : Computer hardware & Software, reference models: OSI and TCP/IP. Novel Network, Data communication services. B-ISDN model.

UNIT - II : Physical layer- Transmission media wireless transmission, RS - 232C and RS 449, Multiplexing. FDH, TDM, Switching. Narrow band and broadband ISDN, Communication satellite.

UNIT - III : Data link layer - framing error detection and correction, data link protocol. Simplex protocol, sliding protocol HDLC, SLIP, PPP, Medium access sublayer IEEE standard 802 for LANS and MANS. High speeds LANs Fast Ethernet, Satellite networks.

UNIT - IV : Network layer design, Routing algorithms, Inter networking Network layer in the Internet. The transport service, transport protocol, The Application layer, Network security, DNS.

TEXT BOOKS :

1. Tanenbaum A. S. "Computer Networks"- - PHI.

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BCA - III -YEAR (BCA - V - SEMESTER)
ELECTIVE (A)
DIGITAL IMAGE PROCESSING

CSA-E-515(a)

Max. Marks : 60

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- UNIT - I :** Digital image representation, image processing system. Fundamentals, image model sampling and quantization, relationship among pixels. Imaging geometry image transforms - Fourier and discrete Fourier transform, 2D Fourier transform, FFT. Separable Image Transform.
- UNIT - II :** Image enhancement by point processing. Spatial filtering, frequency domain, color image processing. Image Restoration degradation model diagonalisation of circulant and block circulant matrices, restoration, inverse filtering least square restoration. Geometric transform.
- UNIT - III :** Image Compression, Models of Image Compression, Error free compression, lossy compression.
Image segmentation - Detection of discontinuities, edge linking and boundary detection, thresholding, segmentation.
- UNIT - IV :** Representation & Description - Representation schemes, boundary descriptors, regional descriptors, morphology. Recognition and interpretation - elements of image analysis, patterns, Decision theoretic methods - matching optimum statistical classifiers, structural methods, Interpretation - logical system. Semantic networks.

TEXTBOOKS:

1. Gonzalez R.C. & Woods R. E. "Digital Image Processing"

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(BCA - III -YEAR (BCA - V - SEMESTER)
ELECTIVE (B)
SIMULATION & MODELLING

CSA-E-515(b)

Max. Marks : 60

-
- UNIT - I:** System models - concepts, environment, continuous & discrete system, modeling type of models, static & dynamic, physical and mathematical models.
- UNIT - II:** System simulation techniques, Monte Carlo method, simulation & analytical methods. Computation continuous model, analogue, digital, hybrid computer, CSSL, CSMP hybrid simulation, interactive system, real time simulation.
- UNIT - III :** System dynamics growth and decay models, modified exponential and generalization of growth models. Probability concepts in simulation, stochastic variables, discrete and continuous probability function, continuous uniform and computer generation of random numbers, uniform random number generator, non-uniform random numbers.
- UNIT - IV :** Discrete system simulation, discrete event representation of time generation of arrival patterns, simulation of telephone systems, delayed calls, discrete simulation languages. Simulation language, introduction to GPSS, general description action times, choice of paths, facilities and storage program, program control statements.
-

TEXT BOOK :

1. Gordan "System Simulation" PHI.
-

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BCA - III -YEAR (BCA - V - SEMESTER)
ELECTIVE (C)
WEB TECHNOLOGY

CSA-E-515 (c)

Max. Marks : 60

-
- UNIT -I :** Data transmission protocols, client/server architecture & its characteristics, ftp & its usages. Telnet concept, remote logging, protocols, terminal emulation, message board, internet chatting - voice chat, text chat.
- UNIT - II :** WWW, History, working, web browsers, its functions concept of search engines, searching the web, http, URLs, web servers, web protocols. Web publishing Concepts, domain name registration, space on host server for web site, html, design tools, html editors, image editors, issues in web site creations & maintenance, ftp software for upload web site.
- UNIT - III :** Concepts of hypertext, versions of html, elements of html syntax, head & body sections, building html documents insertion texts, images, hyperlinks, backgrounds and color controls , different, html tags, table: table layout and presentation , use of font size & attributes, list types and its tags. Use of frames and forms in web pages
- UNIT - IV :** JavaScript overview, JavaScript and the www, JavaScript vs. VB script, JavaScript vs. java, JavaScript versions, script element, inline JavaScript, including JavaScript. Functions: functions introduction, calling functions. JavaScript comments: comments overview, when to comment, types of comments Variables: variables overview, declaring variables, types of variables, casting variables, alert box. Expressions: arithmetic operators, assignment operators, logical operators, expressions and precedence. Statements: if statement, for statement, while statement, break/continue
-

TEXT BOOKS:

1. Level module - M 1.2 Internet & web page designing by V.K. Jain - BPB Publications.
 2. Internet for everyone - Alexix Leon and Mathews Leon, Vikas Publishing House Pvt. Ltd. New Delhi
 3. Internet for dummies - Pustak Mahal, New Delhi a beginner's guide to html available at : [http://www/ncsa.uiuc.edu/General/internet/WWW/HTML primer ALL.html](http://www/ncsa.uiuc.edu/General/internet/WWW/HTMLprimerALL.html)
-

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BCA - III -YEAR (BCA - V - SEMESTER)
SOFTWARE LABORATORY - V

CSA-C-516 & 517

Max. Marks : 100

UNIT - I : PROBLEMS BASED ON COMPUTER GRAPHICS.

UNIT - II : UNIX PROGRAMMING

UNIT - III : PROBLEMS BASED ON ELECTIVE

UNIT - IV : MINI PROJECT (B5) (UNIX / GRAPHICS/ ELECTIVE)

Note: Students should be asked to perform practical based on the above four units.

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BCA - III -YEAR (BCA - VI - SEMESTER)
PROJECT

CSA-C-611

Max. Marks : 500

Every student shall be spending 4 months to 6 months for Industrial Training on a live project. The report in hard bound form should contain the system design, analysis, feasibility etc. The report should contain the original certificate from the company about the originality of the work and the certificate to that effect that the work has actually been done by the candidate concerned in the industrial environment.

There should be three/ four reports submitted by the student through the project manager of the Company where the student is working. Every report should be signed by the Project leader, on the left head and should be dated 1st of every month of the period, he/ she is working.

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