

Academic Year: 2023-2024

Bachelor of Computer Application



**Syllabus & Scheme
Semester – I & II**

**School of Computer Science
& Applications**





GYANVEER UNIVERSITY, SAGAR (M.P.)

Scheme of Examination BCA I Semester (Major /Minor/Elective)

School of Computer Science (Academic Session 2023-24)

Subject wise distribution of marks and corresponding credits

S. No.	Course Type	Subject	Subject Code	Paper Name	Maximum Marks Allotted										Total Marks	Contact Periods Per week			Total Credits
					Theory Slot					Practical Slot						L	T	P	
					End Term Exam	Internal Assessment Class test (Descriptive & Objective)/Assignment/Seminar/			Internal Assessment			External Assessment							
					FINAL EXAM	Internal Assessment I	Internal Assessment II	Internal Assessment III	Class test/ Interaction	Attendance	Practical/ Presentation	Viva Voce	Lab Work						
3	Major	Computer Application	BCA111T	Computer Fundamentals, Organization and Architecture	60	20	20	20	-	-	-	-	-	100	4	0	0	4	
4	Major	Computer Application	BCA111P	Computer Fundamental and Digital Lab	-	-	-	-	10	10	20	10	50	100	0	0	2	2	
1	Minor	Computer Application	BCA112T	Programing & Problem Solving Through C	60	20	20	20	-	-	-	-	-	100	4	0	0	4	
2	Minor	Computer Application	BCA112P	Programing Lab C	-	-	-	-	10	10	20	10	50	100	0	0	2	2	
5	Elective	Computer Application	BCA113T	Probability & Statistics	60	20	20	20	-	-	-	-	-	100	4	0	0	4	
8	AECC	Foundation Course	AECC111T	English Communication	50	-	-	-	-	-	-	-	-	50	2	0	0	2	
			AECC112T	Environmental Studies	50	-	-	-	-	-	-	-	-	-	50	2	0	0	2

Total of Creditd is 6+6+4+4 = 20

Note: Allotment of Marks for Internal Assessment for theory portion is Best of Two / either of two and addition of them.

*Student elect One Subject Elective Subject out of Elective subject.



BCA- Semester-I

BCA111T - Computer Fundamentals, Organization and Architecture

Objectives

- Understanding the peripheral devices and computer generations.
- Understanding the basic functions of Microsoft word and excel.
- Understanding the basic functions of Microsoft Power- & creating the presentation.
- Understanding the categories of programs, system software and applications.
- Understanding the concepts of Internet, Web resources & networks.

Course Content:

Unit – I

(Lecture- 12)

Fundamentals of Computer: Introduction and definition of computer, Computer Generations, Characteristics of Computer, Advantages and Limitations of computer, Classification of computers, Functional components of a computer system (Input, CPU, Storage and Output Unit),

Types of Computers: Analog Digital, Micro, Mini, Mainframe & Super Computers, Work Station, Server computers, Types of memory (Primary and Secondary), **Computer Hardware:** Input Devices- Mouse, Bar Code Reader, Keyboard, Scanner, Joystick, Output Devices-VDU, Printer, Plotters, Types of Computer Software.

Unit – II

(Lecture- 12)

Computer Languages: Introduction to languages, Compiler, Interpreter and Assembler, High Level Language to Machine Language Conversion , Evolution of programming language, Classification of Programming Languages, Features of a good Programming Language, Example of High Level Languages, Characteristics of a good language.

Number system: Binary number system, Octal & Hexa-decimal number system, conversion, r and $r-1$ compliment, addition and subtraction using r and $r-1$ compliment method, weighted and non weighted code.

Unit – III

(Lecture- 12)

Basic Computer Organization: Instruction codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycles, Memory Reference Instruction, Input- Output & Interrupts
Instruction formats, Addressing modes, Instruction codes, Machine Language, Assembly language.

Register Transfer and Micro operations: Register Transfer Language, Register Transfer, Bus & Memory Transfer, Arithmetic Micro operations, Logic Micro-operations, Shift Micro-operations.



Unit – IV

(Lecture- 12)

Processor and Control Unit: Hardwired vs. Micro programmed control Unit. General Register Organization, Stack Organization, Instruction Format, Data Transfer & Manipulation, Program Control, Introductory concept of RISC, CISC, advantages and disadvantages of both.

Pipelining- concept of pipelining, introduction to pipelined data path and control- Handling data hazards & Control hazards.

Unit – V

(Lecture- 12)

Memory and I/O Systems – Peripheral Devices, I/O Interface, Data Transfer Schemes- Program Control, Interrupt, DMA Transfer, I/O Processor.

Memory Hierarchy, Processor vs. Memory Speed, High-Speed Memories, Main memory & its types, Auxiliary memory, Cache Memory, Associative Memory, Interleaving, concept of Virtual Memory, Hardware support for Memory Management.

Learning Outcomes:

Upon successful completion of the course

Student will learn the classification, type's components memories of a computer system and the practical knowledge relatively.

Reference:

- Leon A. & Leon M., Introductions to Computers, VikasPublication.
- Norton Peter, Introductions to Computers, TMH Publication.
- Price Michael, Office in Easy Steps, TMH Publication.
- O'Leary Timothy, O'Leary Linda , Microsoft Office ,TMH Publication.
- Kanitkar Yashwant, Let Us C, BPB Publishing
- Sinha P.K., Computer Fundamentals, BPB Publishing.
- <https://learnengineering.in/computer-fundamentals-by-p-k-sinha-free-download/>
- <http://www.mcqsquestions.com/2015/01/fundamentals-of-computer-mcq-questions-set-10.html>



BCA- Semester-I

BCA112T - Programming & Problem Solving Through "C"

Objectives:

- General Knowledge of Programming types, Problem solving concepts, usage of Algorithm/ Flowchart.
- Writing, compiling and debugging programs in C language.
- Students will learn how to design structure of c programs, using tokens.
- Formatted and unformatted I/O, control statement and Looping. Design programs containing decision structures.

Course Content:

Unit -I:

(Lecture-12)

Overview of Problem solving: Introduction to computer based Problem solving, Programming concepts with flowcharting and algorithms, classification of Programming languages, Programming environment {Assemblers, compilers, interpreters, linkers and loaders}. Developing and debugging flowcharts for programming problem.

Unit - II:

(Lecture-12)

Fundamentals of C programming: Overview of C - Various constructs of C program, coding style, data types, constants and variables, expressions and operators, basic input/output operations and formatting characters, decision making and branching, looping constructs, Arguments to main, Enumerations and bits fields, typedef, type casting, Storage class.

Unit-III:

(Lecture-12)

Array and their Applications: Arrays {one dimensional and multidimensional array}, String Handling, Searching (Linear and binary) and sorting (selection, bubble, insertion) techniques, matrices operations.

Unit-IV:

(Lecture-12)

Advanced Programming Concepts: Structures and union, Functions {Standard and User defined function, parameter passing, scope rules}, Recursion {Using recursion, conversion of recursive program to non-recursive}. Dynamic memory allocation and pointer {Uses, pitfalls, pointer to various user defined and standard data types}.

Unit -V:

(Lecture-12)

More Advanced Programming Concepts: Pre-processors {define, include, macro's, ifdef...}. Introduction to file handling. Header files creation, introduction to Graphics.



Learning Outcomes:

- General Knowledge of Programming types, Problem solving concepts, usage of Algorithm/ Flowchart.
- Writing, compiling and debugging programs in C language.
- Students will learn how to design structure of c programs, using tokens.
- Formatted and unformatted I/O, control statement and Looping. Design programs containing decision structures.

Required Text(s):

- B.W. Kerighan & D.M. Ritchie, The C programming Language, 2nd Edition Prentice Hall,1998.
- Herbert Schildt, C++ The Complete Reference, 4th Edition McGraw-Hill 2000.
- Yashavant Kanetkar, Let Us C, 8th Edition, Infinity Science Press 2008.
- Ashok N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education.



BCA- Semester-I

BCA113T - Probability & Statistics

Objectives:

- Describe and calculate the mean deviation, standard deviation, range
- Understanding and use the terminology of probability.
- Determine whether two events are mutually exclusive and independent.
- Calculate probabilities using the addition and multiplication rules.
- Understand the basic concepts of linear regression and correlation.

Course Content:

Unit-I:

(Lecture- 12)

Theory of Probability – I

Event and Sample space, Probability of an event, Addition and multiplication theorem of probability, Inverse probability, Baye's theorem, Continuous probability.

Unit-II

(Lecture- 12)

Theory of Probability – II

Probability density function and its applications, Standard deviation of various continuous probability distributions, Mathematical expectation, Expectation of sum and product of random variables.

Unit-III

(Lecture- 12)

Dispersion and Distribution:

Measures of dispersion: Range and interquartile range, Mean deviation and Standard deviation, Moments, Skewness and kurtosis. Moment generating function. Theoretical distribution: Binomial, Poisson, Rectangular, Exponential.

Unit-IV

(Lecture- 12)

Curve fitting and Correlation:

Methods of least squares, Curve fitting, Correlation and regression, Partial and multiple correlations (up to three variables only)

Unit-V

(Lecture- 12)

Sampling:

Sampling of large samples, Null and alternative hypothesis Errors of first and second kinds, Level of significance and critical region, Tests of significance based on chi-square (χ^2), t F and Z distribution.

Learning Outcomes:

- Upon Successful completion of the course the students will learn the basic probability theory and basic descriptive statistics with related calculations and data presentation.

Text Books:

1. H.C. Saxena and J.N. Kapoor: Mathematical Statistics. S. Chand & Co. 2010
2. E.Rukmangadachari: Probability and Statistics, Pearson Education India; First edition, 2012s
3. मध्यप्रदेश हिन्दी अकादमी से प्रकाशित विषय से संबंधित पुस्तकें।

Reference Books:

1. Vijay K. Rohatgi, A. K. Md. EhsanesSaleh: An Introduction to Probability and Statistics, Wiley; 3rd edition, 2015.
2. S.C. Gupta and V.K. Kapoor: Rundamentals of Mathematical Statistics, Sultan Chand & Sons, 2014



BCA- Semester-I
BCA111P - Computer Fundamental and Digital Lab

Objectives

- Applying the usage of system settings and window's features.
- Applying the Microsoft office word to create professional and academic documentation.
- Applying the basic function of MS-excel to prepare the worksheet.
- Applying the MS-Office power point to create the Power Point presentation
- Creating and editing database using MS-access.

Course Content:

(Total Hours - 35)

- Unit-I:** Introduction to Windows: Windows features including Control Panel and it's Components, Graphical features, Desktop setting with screensaver and wallpaper, Color, Background, Cut, Copy, Paste, Creating folder.
- Unit-II** **MS-WORD**
Creating, Editing, Formatting: Font name, size, color, alignment, changing paragraph settings, Using Word Art ,Hyperlink, change case, spell checker, Mail Marge, Creating Tables, editing tables, alignment settings in tables.
- Unit-III** **MS-EXCEL**
Creating, Editing, Formatting: Font name, size, color, alignment, entering data, sorting data, Inserting, renaming and deleting Sheet, Inserting row, column, cell, picture, background, graph, symbol, applying formula in a cell, Call by Value, Call by Reference, hyperlink, object, diagram, Macro.
- Unit-IV** **I. Computer Fundamental**
1. Identify various parts inside the CPU like motherboard, SMPS, ports, buses, IC chips, Processor, HDD, RAM etc.
2. Identify various I/O devices available in the lab physically.
3. Identify various parts of the computer by physical examination.
- Unit-V** **II. Digital Electronics**
1. Verification and interpretation of truth table for AND, OR, NOT gates
2. Verifieation and interpretation of truth table for NAND, NOR gates
3. Verification and interpretation of truth table for Ex-OR, Ex-NOR gates
4. Study of half adder using XOR and NAND gates and verification of its operation
5. Study of half subtractor and verification of its operation
6. Study of full subtractor and verification of its operation
7. Realization of logic functions with the help of NAND -Universal Gates
8. Realization of logic functions with the help of NOR –Universal Gates
9. Verify the truth table of RSflip-flops using NAND and NOR Gates
- Learning Outcomes:** Upon successful completion of the course students will be able to understand Microsoft office word to create professional and academic documentation



BCA - Semester- I

BCA112P – “C”- Language Lab

Objectives :

- General Knowledge of Programming types, Problem solving concepts, usage of Algorithm/ Flowchart.
- Writing, compiling and debugging programs in C language.
- Students will learn how to design structure of c programs, using tokens.
- Formatted and unformatted I/O, control statement and Looping. Design programs containing decision structures.

1. Write a C program to find sum and average of three numbers.
2. Write a C program to find the sum of individual digits of a given positive integer.
3. Write a C program to generate the first n terms of the Fibonacci sequence.
4. Write a C program to generate prime numbers between 1 to n.
5. Write a C program to Check whether given number is Armstrong Number or Not.
6. Write a C program to evaluate algebraic expression $(ax+b)/(ax-b)$
7. Write a C program to check whether given number is perfect number or Not.
8. Write a C program to check whether given number is strong number or not.
9. Write a C program to find factorial of a given integer using non-recursive function.
10. Write a C program to find factorial of a given integer using recursive function.
11. Write C program to find GCD of two integers by using recursive function.
12. Write C program to find GCD of two integers using non-recursive function.
13. Write a C program to find both the largest and smallest number in a list of integers.
 - a) Write a C Program to Sort the Array in an Ascending Order.
 - b) Write a C program to perform addition of two matrices.
14. Write a C program that uses functions to perform Multiplication of Two Matrices.
15. Write a C Program to find whether given matrix is symmetric or not.
16. Write a C program to use function to insert a sub-string in to given main string from a given position.
17. Write a C program that uses functions to delete n Characters from a given position in a given string.
18. Write a C program using user defined functions to determine whether the given string is palindrome or not.
19. Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.
20. Write C program to count the number of lines, words and characters in a given text.
21. Write a C program to find the length of the string using Pointer.
 - a) Write a C program to Display array elements using calloc() function.
22. Write a C Program to Calculate Total and Percentage marks of a student using structure.

