

LNCT UNIVERSITY, BHOPAL

Programme:- BCA (AI&DA)

Semester - I

wef: July 2025

Name of Paper& Category		Paper Code	Theory					
			Credit			Marks		
Problem Solving and Programming in C (Major)		BAI-101	L	T	J	EST	CAT	Total
			3	1	0	70	30	100
Course Objective		The objective of this course is to provide foundation in the basic concepts of C programming. Also to teach the students the development of programming logics that are appropriate for problems solving.						
Units	Contents (<i>Theory</i>)							Hours /week
I	Overview of C Language: Programming concepts:-Software, Classification of Software, Modular Programming, Structured Programming, Algorithms and Flowcharts with examples History of C, Character set, C tokens, Identifiers, Keywords, Data types, Variables, Constants, Symbolic Constants , Operators in C, Hierarchy of Operators, Expressions, Type Conversions and Library Functions, Storage Classes - Automatic, External, Static and Register Variables							8
II	Control Statements and Functions: Decision Making Statements - if Statement, if–else statement, nesting of if-else statements, else–if ladder, switch statement, Looping –for loop, while, do-while, Nested loop, break, continue, and goto statements. Functions: Function Definition, prototyping, types of functions, passing arguments to functions, Nested Functions, Recursive functions.							8
III	Arrays and Strings: Declaration and Initialization, Types of Arrays, Operations on arrays, Strings: Declaration and Initialization, String Functions, Arrays of strings, passing strings to functions.							8
IV	Pointers, Structure and Union: Pointer concept, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, Pointer Arithmetic, Functions And Pointers, Arrays And Pointers, Pointer Arrays, Structure: Definition and declaration; Variables initialization; Accessing members of a Structure; , arrays of structures , size of structure ,Nested structures, Union: Definition and declaration, difference between Union and structure .							8
V	I/O Formats and Files: Concept of Files, Text and Binary files, File Opening in Various Modes and Closing of a File, Reading from a File, Writing onto a File.							8

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Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
E. Balaguruswamy	Programming in ANSI C	7 th edition	Mc Graw Hill
Brian W. Kernighan and Dennis M. Ritchie	The C programming language	2 nd edition, 1988	Prentice Hall of India
Yashavant Kanetkar	Let Us C	15 th Edition	BPB
Yashavant Kanetkar	Working With C	1994	BPB

COURSE OUTCOMES: Students will be able to

C01	Write, compile and debug programs in C language.
C02	Design programs involving decision structures, loops and functions.
C03	differentiate between call by value and call by reference.
C04	Understand the dynamics of memory by the use of pointers.
C05	Create/update basic data files.

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Name of Paper& Category		Paper Code	Theory					
			Credit			Marks		
Computer Fundamentals and Organization (Minor)		BAI-102	L	T	J	EST	CAT	Total
			3	1	0	70	30	100
Course Objective		The objective of this course is to help to acquire the basic learning and knowledge of computer. Also to understand digital systems and acquire the knowledge of computer organization.						
Units	Contents (Theory)							Hours /week
I	Introduction to Computer: Computer Characteristics, Concept of Hardware, Software, Evolution of computer and Generations, Type of Computers – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer, Limitations of Computer, Applications of Computer in Various Fields. Functional Block Diagram of Computer: CPU, ALU, Memory Unit, Bus Structure of Digital Computer – Address, Data and Control Bus.							8
II	Input/output Devices: Input Device, Keyboard, Mouse, Scanner, MICR, OMR. Output Devices – VDU, Printers – Dot Matrix, Daisy-wheel, Inkjet, Laser, Line Printers and Plotters. Computer Memory: Memory Concept, Memory Cell, Memory Organization, Semiconductor Memory – RAM, ROM, PROM, EPROM, Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk. Software – System and Application Software.							8
III	Introduction to Digital Systems: Introduction to Digital electronics, Digital and Analog Signals and Systems, Binary Digits, Data Representation: Number System: Binary, Octal, Hexadecimal, Conversions from one base to another. Binary Arithmetic: Binary arithmetic operations; Representation of Negative Numbers;l’s complement and 2’s complement, Complement arithmetic, Binary Codes: BCD code, ASCII code, EBCIDIC code.							8
IV	Boolean algebra: Rules and laws of Boolean algebra, Boolean theorems, Boolean functions and Truth tables, Digital Logic gates: Basic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates–XOR, XNOR, NAND, NOR, Half-Adder, Full-Adder, Encoders, Decoders, Multiplexers, De- multiplexers, Flip-flops, Registers, Counters.							8

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V	Memory Organization: Primary memory-RAM, ROM, PROM, EPROM, PLA programmable logic array, Secondary memory and its types, Internal organization of a memory chip, Organization of a memory unit, Concept of cache memory, Concept of virtual memory.	8
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Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
M. Morris Mano	Digital Logic and Computer Design	4 th edition, 2013	Prentice Hall of India Pvt. Ltd.
W. Stallings	Computer Organization and Architecture- Designing for Performance	6 th edition, 2003	Prentice Hall, Inc.
Andrew S. Tanenbaum,	Structured Computer Organization	6 th edition, 2013	Prentice Hall of India Pvt. Ltd.
S.K. Basandra	Computer Today	First edition, Ver. 06, 1995	Galgotia Publications.
P.K. Sinha	Computer Fundamentals	6 th edition, 1992	BPB publications
B. Ram	Computer Fundamentals and Architecture	4 th edition, 2000	New Age International

COURSE OUTCOMES: Students will be able to

CO1	Identity input and output devices of Computer system.
CO2	Understand Computer hardware and Computer Software
CO3	Convert different type of codes and number systems which are used in digital communication and computer systems.
CO4	Create the appropriate truth table from a description of a combinational logic function.
CO5	Design and analyze circuits for digital arithmetic.

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Name of Paper & Category		Paper Code	Theory					
			Credit			Marks		
Mathematics (GEC)		BAI-103	L	T	J	EST	CAT	Total
			3	1	0	70	30	100
Course Objective		The objective of this course is to teach the basic concepts of mathematics.						
Units	Contents (<i>Theory</i>)							Hours /week
I	Sets: Introduction of elements of mathematics, Set & subset, Finite and Infinite set, Equal set, Null set, Proper subset, universal set, Singleton set. Union, Intersection, complement of set. Common applications of set.							8
II	Theory of Indices: Definition & types of matrices, Elementary transformation of matrices, Determinant and matrices, Special matrices, Addition and subtraction of matrix, Inverse of a matrix. Ratio and Proportion equation, Percentage, Percentages of different quantities, Commission & Brokerage, Discount, Profit & Loss.							8
III	Permutation Combinations & Probabilities: The rules of sum and product, Permutations, Combinations, Binomial and Multinomial theorems, Combinations with repetitions.							8
IV	Frequency distribution: Histogram, Measure of central tendency, Mean, Mode, Median, Standard deviation.							8
V	Mathematical Series: Arithmetic, Geometric & Harmonic Series. Differentiation of functions, derivatives of some common functions, polynomials, exponential, logarithmic & trigonometric functions.							8

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Text Books/Reference Books:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
S. M. Shukla.	Business Mathematics	2018	Sahitya Bhawan Publications
H. S. Sharma.	Mathematical Statistics	First Edition,2017	Ram Prasas Publications
Ray & Seth.	Matrices	2014	R. Chand and Co.
D.C. Agarwal , Sonendra Gupta, Avnish Mishra	Business Mathematics	2017	Shree Sai Prakashan
COURSE OUTCOMES: Students will be able to			
CO1	Understand the foundations of mathematics.		
CO2	Perform basic computations in higher mathematics.		
CO3	Understand set related operations.		
CO4	Solve polynomials, exponential, logarithmic & trigonometric functions.		
CO5	Understand and solve probability and permutation and combination problems.		

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Name of Paper & Category		Paper Code	Theory					
			Credit			Marks		
PC Package (AEC)		BAI-104	L	T	J	EST	CAT	Total
			3	1	0	70	30	100
Course Objective		The objective of this course is to provide complete and versatile computing solution that meets their needs for productivity, entertainment, and connectivity, enabling them to accomplish tasks efficiently and enjoy a seamless digital experience.						
Units	Contents (<i>Theory</i>)							Hours /week
I	MS Word Basics: Introduction to MS Office, Introduction to MS Word, Features & area of use. Working with MS Word, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Working with -Styles, Text Attributes, Paragraph and Page Formatting, Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options.							8
II	Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers, Inserting – Page Numbers, Pictures, Files, Auto texts, Symbols etc., Working with Columns, Tabs & Indents, Creation & Working with Tables including conversion to and from text, Margins & Space management in Document, Adding Reference and Graphics, Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.							8
III	MS Excel: Introduction and area of use, Working with MS Excel, Toolbars, Menus and Keyboard Shortcuts, concepts of Workbook & Worksheets, Using Wizards, Various Data Types, Using different features with Data, Cell and Texts, Inserting, Removing & Resizing of Columns & Rows, Working with Data & Ranges, Different Views of Worksheets, Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text, Cell Formatting including Borders & Shading.							8
IV	Advanced Features of MS Excel: Multiple Worksheets: Concept, Creating and Using Multiple Worksheets; Use of Formulas, Calculations & Functions, Various types of Functions, Cell Referencing, Absolute and Relative Addressing, Working with Different Chart Types, Chart Wizard, Printing of Workbook & Worksheets with various options, Database: Creation, Sorting, Query and Filtering a Database; Creating and Using Macros.							8
V	MS PowerPoint: Introduction & area of use, Working with MS PowerPoint, Creating a New Presentation, Working with Presentation, Using Wizards, Slides & its different views, Inserting, Deleting and Copying of Slides, Working with Notes, Handouts, Columns & Lists, Adding Graphics, Sounds and Movies to a Slide, Working with Power Point Objects, Designing & Presentation of a Slide Show, Printing Presentations, Notes, Handouts with print options.							8

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Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
John r. Levine	Windows XP complete reference	2 nd edition	BPB publications
Stephen l. Nelson	MS OFFICE XP complete	2000	BPB publications
Robert cowart	MS WINDOWS XP home edition complete	2002	BPB Publications
Joe habraken,	Microsoft office 2000, 8 in 1	2000	Prentice hall of India

COURSE OUTCOMES: Students will be able to

CO1	Proficiently create, format, and edit documents using Microsoft Word.
CO2	Functionalities for efficient document creation, collaboration, and automation in Microsoft Word.
CO3	Equip participants with the skills to proficiently utilize spreadsheet software for data management,
CO4	Effectively utilize advanced functionalities such as data analysis, macros, pivot tables, and automation techniques to optimize spreadsheet.
CO5	Create dynamic and visually appealing presentations.

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Name of Authors	Titles of the Book	Edition	Name of the Publisher
McKinney, W.	Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython	3rd	O'Reilly Media
James, G., Witten, D., Hastie, T., & Tibshirani, R.	An Introduction to Statistical Learning: With Applications in R	2nd	Springer
Grus, J.	Data Science from Scratch: First Principles with Python	2nd	O'Reilly Media

COURSE OUTCOMES: Students will be able to

CO1	Understand the fundamentals of Data Science, Big Data, and various data types.
CO2	Analyze and differentiate between types of Machine Learning and their applications.
CO3	Understand core concepts and history of Artificial Intelligence.
CO4	Apply data analysis techniques using Excel functions and Power BI tools.
CO5	Demonstrate the use of big data tools and machine learning frameworks in distributed systems.

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Name of Paper& Category	Paper Code	Practical				
		Credit		Marks		
Programming Lab in C (Major)	BAI-106	P	J	ESP	CAP	Total
		2	-	70	30	100

Programming List:-

1. WAP that accepts the marks of 5 subjects and finds the sum and percentage marks obtained by the student.
2. WAP that calculates the Simple Interest and Compound Interest. The Principal, Amount, Rate of Interest and Time are entered through the keyboard.
3. WAP to calculate the area and circumference of a circle.
4. WAP that accepts the temperature in Centigrade and converts into Fahrenheit using the formula $C/5=(F-32)/9$.
5. WAP that swaps values of two variables using a third variable.
6. WAP that checks whether the two numbers entered by the user are equal or not.
7. WAP to find the greatest of three numbers.
8. WAP that finds whether a given number is even or odd.
9. WAP that tells whether a given year is a leap year or not.
10. WAP that accepts marks of five subjects and finds percentage and prints grades according to the following criteria:
Between 90-100%-----Print 'A'
80-90%-----Print 'B'
60-80%-----Print 'C'
Below 60%-----Print 'D'
11. WAP that takes two operands and one operator from the user and perform the operation and prints the result by using Switch statement.
12. WAP to print the sum of all numbers up to a given number.
13. WAP to find the factorial of a given number.
14. WAP to print sum of even and odd numbers from 1 to N numbers.
15. WAP to print the Fibonacci series.
16. WAP to check whether the entered number is prime or not.
17. WAP to find the sum of digits of the entered number.

Note: Execute the code of programs and develop an algorithm with flowchart.

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Name of Paper& Category	Paper Code	Practical				
		Credit		Marks		
Lab in PC Package (Minor)	BAI-107	P	J	ESP	CAP	Total
		2	-	70	30	100

Contents:-

1. Basic Computer Operations:
 - Powering on/off the computer
 - Navigating the operating system
 - Using the keyboard and mouse
2. File Management:
 - Creating, renaming, and deleting files and folders
 - Copying, moving, and organizing files and folders
3. Operating System Basics:
 - Understanding the file system
 - Managing user accounts and permissions
 - Customizing system settings
4. Internet and Web Browsing:
 - Connecting to the internet
 - Using web browsers
 - Searching and navigating websites
5. Word Processing:
 - Creating and formatting documents
 - Inserting images and tables
 - Spell checking and grammar checking
6. Spreadsheets:
 - Creating and formatting spreadsheets
 - Entering data and formulas
 - Using functions and creating charts
7. Presentations:
 - Creating and designing slides
 - Adding text, images, and multimedia
 - Applying transitions and animations
8. Computer Security:
 - Importance of passwords and user accounts
 - Recognizing and avoiding phishing scams
 - Installing and updating antivirus software
9. Data Backup and Recovery:
 - Creating data backups
 - Restoring files from backups
 - Using recovery options in case of system failure

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Name of Paper & Category		Paper Code	Theory					
			Credit			Marks		
भारतीय मूल परंपरा एवं नैतिक शिक्षा (AEC)		FC-112	L	T	J	EST	CAT	Total
			-	-	-	-	-	-
Course Objective		भारतीय मूल परंपरा एवं नैतिक शिक्षा का उद्देश्य, छात्रों में संस्कृति, मूल्य और नैतिक मूल्यों की समझ बढ़ाना एवं उन्हें समृद्धि और सही मार्गदर्शन के साथ समाज में उपयोगी नागरिक बनाना है।						
Units	Contents (Theory)							Hours /week
I	<p>भारतीय ज्ञान परंपरा:-</p> <p>भारतीय ज्ञान का स्वरूप, विभिन्न कालों में ज्ञानार्जन के प्रमुख केंद्र एवं उद्देश्य (वैदिक, बौद्ध, जैन), भारतीय ज्ञान की विषय वस्तु, भारतीय ज्ञान का व्यवहारिक जीवन में महत्व</p> <p>आश्रम व्यवस्था :-</p> <p>अर्थ एवं अवधारणा (भारतीय समाज में), आश्रम व्यवस्था के प्रमुख चरण (ब्रम्चर्य, गृहस्थ, सन्यास, वानप्रस्थ), आश्रम व्यवस्था के मूलभूत उद्देश्य एवं प्राप्ति</p> <p>सोलह संस्कार :-</p> <p>संस्कार का अभिप्राय, सोलह संस्कारों का क्रमानुसार परिचय, हिन्दू धर्म में सोलह संस्कारों का महत्व</p> <p>अष्टांग योग :-</p> <p>परिचय, अष्टांगयोग के आठ चरण, अष्टांग योग के लाभ</p>							8
II	<p>रामचरित मानस :-</p> <p>प्रमुख पात्रों का परिचय, विभाजनो (कांडों) का सार, मार्मिक अभिव्यक्तियां – राम भरत मिलाप, लक्ष्मण- परशुराम संवाद, राम-सुग्रीव की मित्रता</p> <p>भगवत गीता :-</p> <p>सामान्य परिचय, समस्त अध्यायों का अर्थपूर्ण सार, जीवन प्रबंधन में भगवत गीता की प्रासंगिकता</p> <p>चरित्र निर्माण एवं समग्र विकास :-</p> <p>उद्देश्य, गुण एवं प्रमुख आयाम</p>							8

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III	महान नीतियों की विवेचना :- विदुर नीति -(परिचय,श्लोकसहित अर्थ) चाणक्यनीति -(निहित संदेश एवं उपयोगिता), विदुर नीति एवं चाणक्य नीति का तुलनात्मक अध्ययन	8
IV	नैतिक शिक्षा एवं मूल्य आधारित शिक्षा :- अर्थ एवं उद्देश्य, मूल्य आधारित शिक्षा के घटक, नैतिक मूल्यों के विकास में शिक्षण संस्थानों की भूमिका, महान विभूतियों के चरित्र का भारतीय संस्कृति पर प्रभाव:- (रानीदुर्गावती, अहिल्याबाई होल्कर, रानीलक्ष्मीबाई, स्वामी विवेकानंद, रवीन्द्रनाथ टैगोर, पंडित जवाहरलाल नेहरू, महात्मा गाँधी, सुभाषचन्द्र बोसआदि)	8
V	आत्मनिर्भर भारत की संकल्पना:- आत्मनिर्भर भारत के पांच स्तम्भ, आत्मनिर्भर भारत अभियान के उद्देश्य, वर्तमान समय में प्रासंगिकता वसुधैवकुटुम्बकम की अवधारणा:- 21 वीं सदी में उपयोगिता “अयं निजः परोवेति गणना लघुचेतसाम्। उदारचरितानाम् तु वसुधैव कुटुम्बकम्” ॥	8

Text Books/ Reference Books:-

Name of Authors

श्री राम शर्मा आचार्य

डॉ. के. सी. मल्लेया

प्रो. सरोज शर्मा

रजनीश कुमार शुक्ल

डॉ. वसंतशिंदे