



UNIVERSITY OF LUCKNOW
DEPARTMENT OF COMPUTER SCIENCE
Lucknow, Uttar Pradesh PIN-226007



B.Sc.-I Semester (NEP-Revised Syllabus 2024)



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Course Code:	P1	Course Title:	PROGRAMMING METHODOLOGY
Course Objectives:			
✓ Aim to equip students with fundamental programming principles, problem-solving skills, and the ability to design and implement software solutions efficiently with C/C++. ✓ Learn about the strategies of writing efficient and well-structured computer algorithms/programs.			
UNIT-	TOPICS		
UNIT- I	Introduction to programming Concept of Problem Solving, General Problem Solving Algorithmic & Heuristics, Steps of problem solving. Problem definition, Program Concept, Characteristics of Programming, Program design, Stages in Program Development, Types of Programming Methodologies viz. top-down and bottom-up programming		
Unit-II	Algorithms, Notations, Design, Pseudocode, Flowcharts, Flowchart symbols, making Flowchart using tool like Raptor tool. The Program Development- Development Cycle Coding & Documenting-Testing &debugging, Program Design-Modular Programming, Structured programming, Programming Conventions. Programming Languages Types, Examples, Translators -Assemblers, Interpreters & Compilers, Editors, Debuggers.		
Unit-III	Basic programming concept Variables and constants, Input, Processing Data, Output Data; Data types Integer, Float, Character, Boolean, String etc.- Format of variable names, Type specific operations - arithmetic, logical, relational etc, Built-in functions for operation		
Unit-IV	Predefined Functions, Programmer-defined Function, Local Variable, Function Overloading, Control flow statements, loops Functions with Default Arguments, Call-By-Value and Call-By-Reference Parameters, Recursion.		
Suggested Readings (Text/Reference Books):			
1.	Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffman, Pearson, 2015		
2.	Programming and problem solving with C++, N. Dale and C. Weems, Jones & Bartlett		



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Course Code:	P2	Course Title:	FUNDAMENTALS OF COMPUTERS
Course Objectives:			
✓ . Provide students with a comprehensive understanding of computer Organisation, Including the basic components of a computer system. ✓ Cover the basics of weighted and non-weighted codes, memory storage units etc.			
UNIT-	TOPICS		
UNIT- I	Definition of Computer, Historical Evolution of computer, Computer System Concept, Characteristics, capabilities and limitations, Generation of computers, Classification of computer, Basic Components of computers: Control Unit, ALU, Memory, Input/Output function, Block diagram, Hardware (different types of hardware components), software Memory Hierarchy: Main memory. Auxiliary memory, Cache memory, RAM, ROM, SRAM, DRAM etc. Introduction to BIOS and UEFI, Booting Process, Stored Program Concept, Processor and its types, Motherboard and its component		
Unit-II	Peripherals, Input Devices- Keyboard, Mouse, Scanners, Bar-code Reader, Light pen, Justification Touch screen etc. Output Devices Monitor, Printers, Plotters, Sound card and Speakers, Storage Devices- Primary vs Secondary Storage, Magnetic Tape, Magnetic Disks, Cartridge tape, Data drives, Hard disk, Floppy disk, Optical disk, Pen drive		
Unit-III	Software (System Software, Application Software, E-accessibility Software) (Open source, freeware, and proprietary software), Computer Programming Language and its types.		
Unit-IV	Introduction to number system- Binary, Octal, Decimal, Hexadecimal (characteristics of each number system), Conversion from one number system to other, complements of number systems and arithmetic operations, Computer codes (BCD, EBCDIC, ASCII Code, Gray code, Excess-3 code and Unicode), Logic gates, Boolean algebra (rules, laws, De Morgan Theorem, Boolean expressions, and simplifications), Bit, BYTE, Nibble and larger units of memory		
Suggested Readings (Text/Reference Books):			
1.	Digital fundamentals Thomas Lloyd, PEARSON EDUCATION publication, Eleventh edition- Global Edition, ISBN10:1-292-07598-8, ISBN13:978-1-292-075983		
2.	. Digital Electronics-principles and integrated circuits. Anil K. Maini. Wiley publications,		
3.	Digital Computer Fundamentals, Thomas C Bartee, McGraw Hill Publisher, , 4thedition		
4.	. Introduction to Computer Science. IITL Education Solutions Pvt. Ltd., Pearson Education		



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Course Code:	Q-1	Course Title:	Programming Concepts
Course Objectives:			
✓ Aim to equip students with fundamental programming principles, problem-solving skills,			
✓ Learn about the strategies of writing efficient and well-structured computer algorithms/programs.			
UNIT	TOPICS		
Unit-I	Introduction to programming- Concept of Problem Solving, General Problem Solving- Algorithmic & Heuristics, Steps of problem solving, Problem definition, Program Concept,		
Unit-II	Characteristics of Programming, Program design, Stages in Program Development, Types of Programming Methodologies viz. top-down and bottom-up programming.		
Unit-III	Algorithms, Notations, Design, Pseudocode, Flowcharts, Flowchart symbols, making Flowchart using tool like Raptor tool. The Program Development-Development Cycle Coding & Documenting-Testing & debugging, Program Design-Modular		
Unit-IV	Programming, Structured programming, Programming Conventions. Programming Languages Types, Examples, Translators -Assemblers, Interpreters & Compilers, Editors, Debuggers		
Suggested Readings (Text/Reference Books):			
1.	Problem Solving and Program Design in C. J. R. Hanly and E. B. Koffman, Pearson, 2015		
2.	Programming and problem solving with C++, N. Dale and C. Weems, Jones & Bartlett Learning, 2010		