

**Department of Computer Science,
University of Lucknow, Lucknow.**

B.Sc.

**Computer Science Syllabus
(Eight-Semester Program As Per NEP- New Education
Policy-2021)**



Syllabus passed by BOS on dated 31.07.2021.

B.Sc (Computer Science) Syllabi, Department of Computer Science, University of Lucknow



Department of Computer Science, University of Lucknow, Lucknow
B.Sc (Computer Science) Eight-Semester Syllabi -2021

Year	Semester	Majore1			Majore2		Minor		CC/CV		Total Credits	Award	
		Paper Name	Credits	Paper	credits	credits	credits	credits					
1	Semester-1	P1	Computer Fundamentals	4	P1	4	P1	4	CC1	4	24	Certificate	
		P2	System Analysis and Design	4	P2	4							
	Semester-2	P3	Programming in C	4	P3	4	P2	4	VC1	4			
		P4 (Lab)	Practical (C Language, Ms-Office)	4	P4	4							
2	Semester-3	P5	Data Structure Using: C++	4	P5	4	P3	4	CC2	4	24	Diploma	
		P6 (Lab)	Practical (Data Structure using C++, Python)	4	P6	4							
	Semester-4	P7	Operating System	4	P7	4	P4	4	VC2	4			
		P8	Management Information system	4	P8	4							
3	Semester-5	P9	Software Engineering	4	P9	4			Internship / Assignment	4	24	B.Sc. Degree	
		P10		Computer Architecture and Microprocessor	4	P10							4
		P11	P11x (Optional)	Cloud Computing	4								
			P11y (Optional)	Database Technologies									
	Semester-6	P12		Application Development using HTML and JavaScript	4	P11	4			Minor Project	4		
		P13		Data Communication and Computer Network	4	P12	4						
		P14	P14x (Lab) (Optional)	Practical (Web-page creation using HTML and JavaScript)	4								
			P14y (Lab) (Optional)	Practical (Database)									
4	Semester-7	P15		Cybersecurity	4			Research Methodology	4	24	B.Sc. Research		
		P16		Quality and Reliability Engineering	4								
		P17		Internet of Things	4								
		P18	P18x (Optional)	Machine Learning	4								
			P18y (Optional)	Data Science									
			P18z (Optional)	Artificial Intelligence									
		P19	P19x (Optional)	Artificial Intelligence	4								
	P19y (Optional)		Web Technologies										
	Semester-8							Major Project	24	24			

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Objective of the Program

The structure of B.Sc. (Computer Science) has been designed to meet following objectives:

- To train students to use full potential of computer and its associated devices.
- To introduce students with computer architecture and its utilization in various fields.
- To introduce students about the emergent computing technologies.
- To impart the necessary skills in students to present quick solutions of real time problems.
- To develop solid foundations for students and making them capable to pursue their post-graduate program.
- To meet the demand of IT professionals.

Program Specific Outcomes

After the successful completion of this undergraduate program, the students shall be able to:

- Develop most feasible solutions to real time problems.
- Write the quality programs to solve mathematical and analytical problems computationally.
- Develop quality and reliable software.
- Perform testing of software and remove the errors from them.
- Develop Web-pages and running them on World Wide Web environment.
- Have prerequisites qualifications, required to get admission in their higher studies.

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SEMESTER-I

Title of the Paper: Computer Fundamentals		
Credit: 4 Course Outcome:	At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Know the basic architecture of computer.• Grasp technologies on which computer works.• Solve Boolean problems and equations.	Theory
Unit -I		
Computer Definition, Evolution of Computers, Generation of Computers, Classification of Computers, Hardware and Software, Analog Digital and Hybrid Computers, Classification of Computers according to size, Super Computers, Mainframe Computers, Personal Computers, Different Terminals , Characteristics and Limitations of Computers.		
Unit -II		
Definition and Purpose of Different Programming Languages, Compiler, Interpreter, Assembler, Classification of software, Flowchart, Pseudo code, Algorithm, Number system (Decimal, Binary, Octal and Hexadecimal) and their Conversion, Binary addition, Binary Subtraction, Binary Multiplication, 1's Complement, 2's Complement.		
Unit -III		
Logic Gates and its application, Universal Gates, Boolean Algebra, Boolean Laws, De-Morgan's theorem based expression Problems, Simplification of expression using Boolean Laws, Karnaugh Map, SOP & POS techniques, Simplification of expression using Karnaugh Map.		
Unit -IV		
Computer Memory, Memory Hierarchy, classification of memory, Different types of secondary Memory, virtual memory, Graphical User Based operating system, Command line Based operating system, Disk Operating System, External and Internal Command in DOS.		

Referenced Books:

- [1] Pradeep K. Sinha and Priti Sinha, "Computer Fundamentals", BPB Publication, Sixth Edition.
- [2] M. Morris Mano, "Digital Logic and Computer Design", PHI publication.

Suggested Readings

- [1] M. Morris Mano, "Computer System Architecture", PHI publication.
- [2] V. Rajaraman and Neeharika Adabala, "Fundamentals of Computers", PHI Publication.

Weblinks:

- [1] <https://www.cl.cam.ac.uk/teaching/1011/CompFunds/CompFunds.pdf>.
- [2] http://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20I%20SEM/BCA-121%20Computer%20Fundamental.pdf.

MP
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Title of the Paper: System Analysis And Design		
Credit: 4		Theory
Course Outcome:	At the end of this course, the successful students will be able to: <ul style="list-style-type: none">Analyze problems.Know the basics of software design.Understand System Development Life Cycle.	
Unit -I		
System concept, Definition, System study, system analysis, System approach, Characteristics and Types of system, Elements of system analysis, System models and types of models, system environment and boundaries, system analyst, role of system analyst, qualification and responsibilities, System analyst as an agent of change, Open and Closed System, Formal and Informal Information Systems.		
Unit -II		
System Development Life Cycle and its various phases, Preliminary investigation, Determination of system requirements, Development of software, System testing, Implementation, evaluation and maintenance, system documentation and consideration, Data flow diagram (DFD) and its various levels, system requirement specification (SRS).		
Unit -III		
System Planning, Feasibility study and its report and importance, various tools and technique, Software Crisis: From programmer's point of view, from users point of view.		
Unit -IV		
System design and modeling, state of system design, process modeling, logical and physical design, system flow chart and structured charts, data flow diagrams, file organization and data base design, system testing and quantity assurance implementation and software maintenance.		

Referenced Books:

- [1] Brijendra Singh, "System Analysis and Design", New Age International Publishers.
- [2] Elias M. Awad, "System Analysis and Design", Galgotia publications.

Suggested Readings:

- [1] Goyal Arunesh, "Systems Analysis and Design", PHI.
- [2] V. Rajaraman, "Analysis and Design of Information Systems", PHI

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <http://www.ddegjust.ac.in/studymaterial/pgdca/ms-04.pdf>.

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