Learning Outcomes based Curriculum Framework

For

Bachelor of Computer Applications

(Four Year Degree Programme)

In line with NEP-2020

Department of Computer Science & Engineering

Faculty of Engineering & Technology

Chaudhary Devi Lal University

Sirsa-125055, Haryana

2022

Contents

1. About the Department

The Department of Computer Science and Engineering was established in the year 2000 at the time when the University used to be the Postgraduate Regional Centre of Kurukshetra University, Kurukshetra. The Department offers instructions in Doctor of Philosophy (PhD), Master of Technology in Computer Science and Engineering (Regular) Full-Time, Master of Technology in Computer Science and Engineering (Regular) Part-time, Master of Computer Applications, apart from the programmes proposed to start from session 2022-23, namely, Master of Science in Computer science (Data Science and Artificial Intelligence), Bachelor of Technology in Computer Science and Engineering (Artificial Intelligence and Machine Learning), Bachelor of Computer Applications 4-Year, Diploma in Cyber Security, and Diploma in Digital Marketing. 2021-22 session onward, all the programmes are offered under Learning Outcome based Curricular Framework.

2. Learning Outcomes based Curriculum Framework

The Choice Based Credit System (CBCS) which was introduced in the University effective from academic session 2016-17 for postgraduate programmes and graduate programmes running only in the University campus. Scope of CBCS was expanded from academic session 2017-18. Effective from session 2021-22, 2021-22 session onward, all the programmes of the Department are offered in Learning Outcome based Curricular Framework, wherein every programme of study have Programme Educational Objectives – wherein, it is mentioned that "where does the Department see its graduates after a four to five years of completion of programme?" Further, every programme has its listed outcomes mentioning "What skills the graduates are expected to possess upon completion of the programme?" Further, every programme of study comprises of courses of study and each course has its slated outcomes – the skill and knowledge that a student is expected to possess upon completion of a specific course.

2.1 Objectives of the Programme

The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software. It helps students analyse the requirements for system development and exposes students to business software and information systems. This programme provides students with options to specialize in legacy application software, system software or mobile applications. Following tangible objectives are expected from the programme:

1. To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
2. To provide opportunity for the study of modern methods of information processing and its applications.
3. To develop among students the programming techniques and the problem- solving skills through programming
4. To prepare students who wish to go on to further studies in computer science and related subjects.
5. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

2.2. Programme Outcomes (POs)

At the time of completion, the BCA graduates are expected to possess the following generic graduate attribute:

1. **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying

complexity

2. **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.

3. **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.

4. **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.

5. **Application Systems Knowledge**: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.

6. **Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.

7. **Communication:** Must have a reasonably good communication knowledge both in oral and writing.

8. **Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.

9. **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrity in a working environment and also have concern on societal impacts due to computer-based solutions for problems.

10. **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.

11. **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

2.3 Programme Specific Outcomes (PSOs)

The fresh graduates of the BCA programme will have the following discipline-specific graduate attributes:

1. Apply standard Software Engineering practices and strategies in real -time software projectdevelopment

2. Design and develop computer programs/computer -based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.

3. Acquaint with the contemporary trends in industrial/research settings and thereby innovatenovel solutions to existing problems

4. The ability to apply the knowledge and understanding noted above to the analysis of a giveninformation handling problem.

5. The ability to work independently on a substantial software project and as an effective teammember.

3. Programme Structure

Bachelor of Computer Applications - four-year (8-semester) graduate programme shall comprise of Discipline Specific Core Courses (CC), Discipline Specific Elective Courses (DSC), Skill Enhancement Courses (SEC), Ability Enhancement Courses (AEC), and Generic Elective Courses (GEC).

Table 1: Courses and Credit Scheme

Semester	Discipline Specific Core Courses (CC)		Discipline Specific Elective Courses (DSC)		Skill Enhancement Courses (SEC)		Ability Enhancement Compulsory Courses (AEC)		Generic Elective Courses (GEC)		Total Credits
	1	2	3	4	5	6	7	8	9	10	(2+4+6+8+10)
	No. of Courses	Total Credits	No. of Courses	Total Credits	No. of Courses	Total Credits	No. of Courses	Total Credits	No. of Courses	Total Credits	
I	5	13	-	-	2	3	2	6	-	-	22
II	5	13	-	-	2	3	3	6	-	-	22
Exit option with a Certificate in Computer Applications.											

Table 2: Semester-wise break-up of courses of different types

Semester	Discipline Specific Core Courses (CC)	Discipline Specific Elective Courses (DSC)	Skill Enhancement Courses (SEC)	Ability Enhancement Compulsory Courses (AEC)	Generic Elective Courses (GEC)	Total Courses (CC+DSC+SEC+AEC+GEC)
I	CC1/T CC2/T CC3/T CC3/P CC4/T	-	SEC1/T SEC1/P	AEC1/T AEC2/T	-	09
II	CC5/T CC6/T CC6/P CC7/T CC7/P	-	SEC2/T SEC2/P	AEC3/T AEC4/T	-	09

Table 3: Course code, course title, maximum marks and course credit

Sr. No.	Course Code	Course Title	Max. Marks			Credit
			Int.	Ext.	Total	
Semester I						
1.	BCA/1/CC1/T	Digital Computer Fundamentals	25	50	75	3
2.	BCA/1/CC2/T	Foundational Mathematics	25	50	75	3
3.	BCA/1/CC3/T	Programming with C	25	50	75	3
4.	BCA/1/CC3/P	Programming with C – Lab	-	50	50	2
5.	BCA/1/CC4/T	I. T. Lab (Office Tools)	-	50	50	2
6.	BCA/1/SEC1/T	PC Troubleshooting	15	35	50	2
7.	BCA/1/SEC1/P	PC Troubleshooting Lab	-	25	25	1
8.	BCA/1/AEC1/T	Hindi	25	50	75	3
9.	BCA/1/AEC2/T	Functional English	25	50	75	3
Sub Total Semester I			**140**	**410**	**550**	**22**
Semester II						
1.	BCA/2/CC5/T	Computer Architecture and Organization	25	50	75	3
2.	BCA/2/CC6/T	Database System	25	50	75	3
3.	BCA/2/CC6/P	Database System Lab	-	50	50	2
4.	BCA/2/CC7/T	Programming with C++	25	50	75	3
5.	BCA/2/CC7/P	C++ Programming Lab	-	50	50	2
6.	BCA/2/SEC2/T	Digital Fluency	15	35	50	2
7.	BCA/2/SEC2/P	Digital Fluency Lab	-	25	25	1
8.	BCA/2/AEC3/T	Environmental Studies	25	50	75	3
9.	BCA/2/AEC4/T	Punjabi	25	50	75	3
Sub Total Semester II			**140**	**410**	**550**	**22**

Table 4: Generic Elective Courses offered by the Department of Computer Science & Engineering for the students of other Departments

#	Course Code	Course Title	Max. Marks			Credit	
			Int.	Ext.	Total		
1	CSE/GEC1/T	Fundamentals of Information Technology	30	70	100	4	4
2	CSE/GEC2/T	Windows and Office Automation Tools	25	50	75	3	4
	CSE/GEC2/P	Windows and Office Automation Tools Lab	-	25	25	1	
3	CSE/GEC3/T	Introduction to Cyber Space	25	50	75	3	4
	CSE/GEC3/P	Introduction to Cyber Space Lab	-	25	25	1	
4	CSE/GEC4/T	Information Technology for Lifelong Learning	25	50	75	3	4
	CSE/GEC4/P	Information Technology for Lifelong Learning Lab	-	25	25	1	

Table 5: Different categories of courses (codes, titles, credits)

#	Course Code	Course Title	Credits
		Core Courses	
1	BCA/1/CC1/T	Digital Computer Fundamentals	3
2	BCA/1/CC2/T	Foundational Mathematics	3
3	BCA/1/CC3/T	Programming with C	3
4	BCA/1/CC3/P	C Programming Lab	2
5	BCA/1/CC4/P	I.T. Lab (Office Tools)	2
6	BCA/2/CC5/T	Computer Architecture	3
7	BCA/2/CC6/T	Database System	3
8	BCA/2/CC6/P	Database System Lab	2
9	BCA/2/CC7/T	Programming with C++	3
10	BCA/2/CC7/P	C++ Programming Lab	2
		Discipline Specific Elective Courses	
	No Discipline Specific Elective Courses are offered in Semester 1 and 2		
		Skill Enhancement Courses	
1	BCA/1/SEC1/T	PC Troubleshooting	2
2	BCA/1/SEC1/P	PC Troubleshooting Lab	1
3	BCA/2/SEC2/T	Digital Fluency	2
4	BCA/2/SEC2/P	Digital Fluency Lab	1
		Ability Enhancement Compulsory Courses	
1	BCA/1/AEC1/T	Hindi	3
2	BCA/1/AEC2/T	Functional English	3
3	BCA/2/AEC3/T	Environmental Studies	3
4	BCA/2/AEC4/T	Punjabi	3
		Generic Elective Courses	
	No Generic Elective Courses are offered in Semester 1 and 2		

BCA/1/CC1/T: Digital Computer Fundamentals							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
					Internal		
Core Theory	03	03	Lecture		25	3 Hours	TEE/MTE/ Assignment/ Attendance
				15	5	5	

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcomes	At the end of this course, the student will be able to:
CO1	describe the organization and operation of a computer processor, primary and secondary memory, peripheral devices and to give computer specifications
CO2	Understand and examine the structure of various number systems and its application in digital design.
CO3	Understand, analyze and design various combinational and sequential circuits.
CO4	be able to apply a design application and propose a cost effective solution.

Course Content **BCA/1/CC1/T: Digital Computer Fundamentals**	
Unit – I	Computer Fundamentals: Definition, Block Diagram along with its components, characteristics & classification of computers.
	Memory: Concept of primary & secondary memory, principle of data storage.
	Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.
	Computer Languages: Analogy with natural language, machine language, assembly language, high- level language, compiler, interpreter, assembler.
Unit – II	Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floating-point representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Concept of Unicode.
	Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions.

Unit – III	Digital Logic: Basic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc. NAND, NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits, Combinational logics.
Unit – IV	Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Encoders, Decoders, Multiplexers, Demultiplexers.
Text/Reference Books	
Text Books	1. Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB. 2. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd. 3. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
Reference Books	1. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd. 2. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

<table>
<tr><th colspan="8">BCA/1/CC2/T: Foundational Mathematics</th></tr>
<tr>
<td rowspan="2">Course Type</td>
<td rowspan="2">Course Credit</td>
<td rowspan="2">Contact Hours/ Week</td>
<td rowspan="2">Delivery Mode</td>
<td colspan="2">Maximum Marks</td>
<td rowspan="2">Exam Duration</td>
<td rowspan="2">Assessment Methods</td>
</tr>
<tr>
<td>External</td>
<td>Internal</td>
</tr>
<tr>
<td rowspan="2">Core Theory</td>
<td rowspan="2">03</td>
<td rowspan="2">03</td>
<td rowspan="2">Lecture</td>
<td rowspan="2">50</td>
<td>25</td>
<td rowspan="2">3 Hours</td>
<td rowspan="2">TEE/MTE/ Assignment/ Attendance</td>
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<tr>
<td>15   5   5</td>
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</table>

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: To provide mathematical background and sufficient experience on various topics of discrete mathematics like matrix algebra, logic and proofs, graphs, algebraic structures, formal languages and finite state automata. To extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

Course Outcomes	At the end of this course, the student shall:
CO1	possess the basic knowledge of matrix, set theory, functions and relations concepts needed for designing and solving problems.
CO2	understand the logical operations and predicate calculus needed for computing skill.
CO3	be capable of designing and solving Boolean functions for defined problems, apply the acquired knowledge of formal languages to the engineering areas like Compiler Design.
CO4	be able to apply the acquired knowledge of finite automata theory and to design discrete problems to solve by computers.

<table>
<tr><th colspan="2">Course Content
BCA/1/CC2/T: Foundational Mathematics</th></tr>
<tr>
<td>Unit – I</td>
<td>Set, subsets and operations on sets, Venn diagram of sets. Power set of a set. Equivalence relation on a set and partition of a set, Permutation and combinations, Partially ordered sets, Lattices (definition and examples). Boolean algebra (definition and examples)</td>
</tr>
<tr>
<td>Unit – II</td>
<td>Matrix algebra: Addition and multiplication of matrices, Laws of matrix algebra, Singular and non singular matrices, Inverse of a matrix, Rank of a matrix, Rank of the product of two matrices, Systems of linear equations and their solutions. - Uniqueness and existence of the solution.</td>
</tr>
<tr>
<td>Unit – III</td>
<td>**Measure of Central Tendency**: Mean, Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode. Measure of Dispersion: Range, Variance and Standard Deviations; Frequency Distributions and Cumulative Frequency Distributions.</td>
</tr>
</table>

	Probability: concept of random experiment, equi-likely outcomes, sample space, favourable outcomes, probability of an event, basic rules of probability, addition and multiplication law of probability
Unit – IV	Probability distribution: its meaning, types: discrete and continuous probability density/distribution functions: some probability distribution functions: Normal, Binomial, Poisson distribution. (basic characteristics and some numerical based on these distributions) Correlation and Regression: (basic characteristics and some numerical based on these)
Text/Reference Books	
Text Books	1. Anthony Croft & Robert Davison, Foundation Maths, Prentice Hall, 2010 2. K. A. Stroud, Dexter J. Booth, Foundation Mathematics, 2009, Palgrave Macmillan
Reference Books	1. Gupta S. P. and Kapoor, V. K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995 2. Freund John E, Mathematical Statistics, PHI, 2000

BCA/1/CC3/T: Programming with C							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand the basic programming constructs they can easily switch over to any other language in future.
CO2	understand the control and conditional structure of C language
CO3	understand the concept of storage classes and array the students will be able to develop applications.
CO4	apply the knowledge gained to develop applications.

Course Content
BCA/1/CC3/T: Programming with C

Unit – I	Planning the Computer Program: Concept of problem solving, Problem definition, Program design.
	Techniques of Problem Solving: Flowcharting, algorithms, pseudo code, decision table, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. characteristics of a good programming language.
Unit – II	Overview of C: History of C, Importance of C, Structure of a C Program. Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant. Input/output: Unformatted & formatted I/O function in C. Operators & Expression: Arithmetic, relational, logical, bitwise, unary, assignment, conditional operators and special operators. Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy &associativity.
Unit – III	Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, GOTO statement.
	Decision making & looping: For, while, and do-while loop, jumps in

	loops, break, continue statement.
Unit – IV	Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime. Functions: Definition, prototype, passing parameters, recursion. Arrays: Definition, types, initialization, processing an array, passing arrays to functions, Strings & arrays.
Text/Reference Books	
Text Books	1. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley. 2. Yashwant Kanetker, Let us C, BPB. 3. Rajaraman, V., Computer Programming in C, PHI. 4. Yashwant Kanetker, Working with C, BPB.
Reference Books	1. Gottfried, Byron S., Programming with C, Tata McGraw Hill 2. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw Hill

BCA/1/CC3/P: C Programming Lab							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BCA/1/CC4/P: I.T. Lab (Office Tools)							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot. Examinees shall be examined in MS Word, MS Excel, and MS Powerpoint.							

BCA/1/SEC1/T: PC Troubleshooting							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Skill Enhancement Course Theory	02	02	Lecture	35	15	3 Hours	TEE/MTE/ Assignment/ Attendance
					10 2.5 2.5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Computer Maintenance and Troubleshooting is frequently required for smooth functioning of computer system. The Objective of this subject is to make the students capable to understand the functioning of hardware parts and develop skills in diagnosing the faults and troubleshoots the computer system. This course will be helpful for students to get employment in the computer maintenance industry as well as self-employment.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand basics of hardware components and acquire the knowledge of finding faults in components
CO2	install, configure and maintain various components in computer system and peripherals.
CO3	diagnose faults of different components
CO4	repair and maintain computer system and its peripherals.

Course Content BCA/1/SEC1/T: PC Troubleshooting	
Unit – I	Fundamentals of PC technology: Fundamental Building Blocks of the PC – Principles of CPU Operations - CPU family & operation **Hardware Basics:** Basic terms, concepts, and functions of system modules, firmware, monitor, boot process, ports. CMOS and BIOS, Overview of system components, Motherboard: definition, Components/connections in motherboard, Knowing mother board of PC, Identifying types of motherboard, SMPS: Circuit diagrams and pin assignments, working of SMPS Input and load requirements.
Unit – II	Formatting of Hard disk, Partitioning of Hard disk in different logical drives, Disk defragmentation, Disk clean up, Scan disk. Printers : Types – Printer Attributes – Printer Maintenance – Troubleshooting Tools and Techniques : Tools of the Trade – Basic PC Handling

	Techniques
Unit – III	Troubleshooting Hanging Problem of Computer, Troubleshooting Memory, Booting Problem and Diagnostic Steps, Identification and Troubleshooting, Virus Problem, Troubleshooting of Modem and Diagnostic, Windows Troubleshooting
Unit – IV	Troubleshooting and Preventive Maintenance Troubleshooting basics, Preventative Maintenance, Using Preventative Maintenance Tools, POST : Functions, Test Sequence, Error messages, Troubleshooting Procedures and Preventative Maintenance: Identifying Troubleshooting Tools, Hardware tools, Diagnostic software, Materials and equipment, Software utilities, Maintaining Environmental Controls, Ventilation and airflow, Humidity and liquids, Dirt and dust, Power, UPS, and suppressors, Completing Maintenance Tasks, Case and components, Power supplies
Text/Reference Books	
Text Books	1. B. Govindarajalu, Hardware Trouble Shooting and Maintenance , Tata McGraw Hill 2. R. P. Beales, PC Systems Installation and Maintenance, Second Edition 3. Ron Gilster, PC Upgrade & Repair, Black Book 4. D. Balasubramanian, Computer Installation and Servicing, Tata McGraw-Hill Education,

BCA/1/SEC1/P: PC Troubleshooting Lab							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Skill Enhancement Course Practical	01	02	Practical	25	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The term-end examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BCA/1/AEC1/T: □□□□□□							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Compulsory Course Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 5 5		

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इकाई - IV	आदिकाल के नामकरण एवं काल–निर्धारण की समस्या, आदिकाल की परिस्थितियाँ एवं प्रवृत्तियाँ

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	4. हिन्दी साहित्य का इतिहास, लेखक आचार्यरामचन्द्र शुक्ल, प्रका''न नागरी प्रचारिणी सभा, का''ी (वाराणसी) 1961

BCA/1/AEC2/T: Functional English							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Compulsory Course Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15	5	5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: To equip the student with the basic capabilities in English grammar

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand the elements of communication
CO2	display speaking skills in social interactions and communication in professional situations such as interviews, group discussions and office environments.
CO3	exhibit the knowledge and understanding of the language of communication
CO4	apply reading, listening and writing skills in personal and professional lives.

Course Content BCA/1/AEC2/T: Functional English	
Unit – I	**Introduction:** Definition and Theory of Communication, Types and modes of Communication. Language of Communication: Verbal and Non-verbal (Spoken and Written); Personal, Social and Business Barriers and Strategies; Intra-personal, Inter-personal and Group communication. Impact of communication on performance
Unit – II	**Speaking Skills:** Monologue, Dialogue, Group Discussion, Effective Oral Communication, Miscommunication, Oral Presentation, Interview, Public Speech
Unit – III	**Remedial English:** Parts of Speech, Sentences, Subject- Verb Agreement, Active and Passive Voice, Degrees of comparison, Direct and Indirect Speech, Question Tags.
Unit – IV	**Writing Skills**: Elements of writing, Documenting, Report Writing, Making notes, Letter writing, Business communications
	Listening Skills: Listening and its types, Barriers of effective Listening,

	Barriers and Strategies foreffective listening, Listening to complaints.
Text/Reference Books	
Text Books	1. Fluency in English - Part II, Oxford University Press, 2006. 2. Business English, Pearson, 2008. 3. Language, Literature and Creativity, Orient Blackswan, 2013. 4. John Eastwood, Be Grammar Ready - The Ultimate Guide to English Grammar, Oxford. 5. Mark Lester and Larry Beason, McGraw-Hill Handbook of English Grammar and Usage, 2e, McGraw Hill
Reference Books	1. Raymond Murphy, English Grammar in Use, 4e, Cambridge 2. B.K. Das and A. David, A Remedial Course in English, Book 2, C.I.E.F.L. (O.U.P.) 1980. 3. A.S. Hornby, Oxford Advanced Learner's Dictionary of Current English (O.U.P.) 4. A Textbook of English Phonetics for Indian Students by T. Balasubramanian.

BCA/2/CC5/T: Computer Architecture and Organization								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods	
				External	Internal			
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance	
					15	5	5	

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objectives are to study the basics involved in computer architecture, Includes the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. Will also expose students to the basic architecture of processing, memory and i/o organization in a computer system

Course Outcomes	At the end of this course, the student will be able to:
CO1	identify, understand and apply different number systems and codes.
CO2	understand the digital representation of data in a computer system
CO3	able to design the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
CO4	apply the knowledge gained to design computer arithmetic formulate and solve problems, understand the performance requirements of systems

Course Content
BCA/2/CC5/T: Computer Architecture and Organization

Unit – I	Sequential Logic: Characteristics, Flip-Flops, Clocked RS, D type, JK, T type and Master-Slave flip- flops. State table, state diagram and state equations. Flip-flop excitation tables
Unit – II	Sequential Circuits: Designing registers – Serial Input Serial Output (SISO), Serial Input Parallel Output (SIPO), Parallel Input Serial Output (PISO), Parallel Input Parallel Output (PIPO) and shift registers. Designing counters – Asynchronous and Synchronous Binary Counters, Modulo-N Counters and Up-Down Counters
Unit – III	Memory & I/O Devices: Memory Parameters, Semiconductor RAM, ROM, Magnetic and Optical Storage devices, Flash memory, I/O Devices and their controllers. Memory hierarchies, memory interleaving, problems of management of memory hierarchies, operation of virtual memories, Associative memories, Cache memories.
Unit – IV	Instruction Design & I/O Organization: Machine instruction, Instruction set selection, Instruction cycle, Instruction Format and Addressing

	Modes. I/O Interface, Interrupt structure, Program- controlled, Interrupt-controlled & DMA transfer, I/O Channels, IOP.
Text/Reference Books	
Text Books	1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd. 2. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd. 3. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw Hill
Reference Books	1. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.

BCA/2/CC6/T: Database System

Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of the course is to study basic of database terminologies, DBMS architecture, characteristics, its use, how to design, how to normalize database and make SQL queries on database.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand the concept of file processing system and DBMS system
CO2	understand the DBMS 3 tire architecture and different types of DBMS models.
CO3	design database using relational algebra simplifications
CO4	apply the knowledge for developing databases applications using the concept of normalization and dependency in relations.

Course Content
BCA/2/CC6/T: Database System

Unit – I	Basic Terminology, Traditional file based Systems- File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, Advantages and Disadvantages of DBMS. Roles in the Database Environment - Database Administrator, Database Designers, Applications Developers and End Users.
Unit – II	Database System Architecture – Three Levels of ANSI/SPARC Architecture, Schemas and Instances, Data Independence – Logical and Physical Data Independence. Classification of Database Management System, Centralized and Client Server architecture to DBMS. Introduction to Data Models, Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams
Unit – III	Relational Model, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations,

	Base Tables and Views. Relational Algebra & various operations (with respective SQL commands), Tuple and Domain calculus
Unit – IV	Functional dependencies & NORMALISATION: Data Redundancy and Update Anomalies. Functional Dependencies:-Full Functional Dependencies and Transitive Functional Dependencies, Decomposition and Normal Forms (1NF, 2NF, 3NF &BCNF).

Text/Reference Books	
Text Books	1. H.F. Korth and S. Sudarshan, Silberschatz , Database System Concepts , 3rd edition, McGraw-Hill, International Edition. 2. Bipin Desai, Introduction to Database Management system, 1991, Galgotia Publications
Reference Books	1. R. Elmasri and S. B. Navathe, Fundamentals of Database Systems, Addison-Wesley, 3rd edition. 2. C. J. Date, Addison-Wesley ,An Introduction to Database Systems, 7th edition, 3. G. W. Hansen and J. V. Hansen, Database Management and Design, Prentice-Hall of India, 2nd edition, 1999 4. K. Majumdar and P. Bhattacharyya, Database Management Systems, Tata McGraw-Hill Publishing, A5th edition, 1999

BCA/2/CC6/P: Database System Lab							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Course Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-Voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.							

BCA/2/CC7/T: Programming with C++							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objectives are to study to learn the syntax and semantics of the C++ programming language. To understand the concept of data abstraction and encapsulation and how to overload functions and operators in C++. To learn how inheritance and virtual functions implement dynamic binding with polymorphism

Course Outcomes	At the end of this course, the student will be able to:
CO1	describe the object-oriented programming approach in connection with C++
CO2	understand the difference between the top-down and bottom-up approach
CO3	capable of designing the concept of file handling concept, polymorphism and exception handling concept in C++
CO4	apply the concepts of object-oriented programming in developing applications

	Course Content BCA/2/CC7/T: Programming with C++
Unit – I	Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition). Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete operators.
Unit – II	Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behaviour of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass/abstract classes.
Unit – III	Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading,

	Parametric polymorphism,
Unit – IV	Generic function – template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance. Files and Exception Handling: Persistent objects, Streams and files, Namespaces, Exception handling, Generic Classes

Text/Reference Books	
Text Books	1. Yashwant Kanetker, "Let us C++", BPB publications. 2. Balagurusamy, E., "Programming in ANSI C++", 4e, Tata McGraw-Hill 3. Jeri R. Hanly & Elliot P. Koffman, "Problem Solving and Program Design in C++", Addison Wesley. 4. Gottfried, Byron S., "Programming with C++", Tata McGraw Hill
Reference Books	1. Behrouz A. Forouzan & Richard F. Gilberg, "Computer Science: A structured programming approach using C", Cengage Learning 2. Ashok N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education. 3. Herbert Schildt, "The Complete Reference: C++", Tata-McGraw-Hill.

BCA/2/CC7/P: C++ Programming Lab								
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Core Course Practical	02	04	Practical	50	-	3 Hours	Practical/ Viva-Voce

Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot.

BCA/2/SEC2/T: Digital Fluency							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Skill Enhancement Course Theory	02	02	Lecture	35	15	3 Hours	TEE/MTE/ Assignment/ Attendance
					10 | 2.5 | 2.5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Objective of this course shall be to imbibe the digital fluency skills in the taught, so that s(he) could be well versed with the digital technologies of the day.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand the concept of computer, internet, and digital media.
CO2	appreciate the applications of computers and digital devices in daily life.
CO3	understand the concepts of virtual learning, digital editing, etc.
CO4	apply the digital media technology in daily life.

Course Content BCA/2/SEC2/T: Digital Fluency	
Unit – I	Basic Computer Concepts and Operations: Basic Computer Concepts and Operations, Computers in Daily Activities, Computer Components, Productivity suites for teaching and learning, Educational Programs and their uses, Basic File Handling Operations, Technology Trends in Education
Unit – II	Internet Fundamentals and Applications: Using the Internet, Internet Applications, Google Advanced Search, Web 2.0 applications for learning, Using Google forms, Internet Ethics and Security
Unit – III	Virtual Learning Environments: Basics of Virtual Learning Environment, Virtual Learning Environment systems, Effective usage of Virtual Learning Environment, Investigate the Features of an LMS / VLE / CMS, Example of a Virtual Learning Environment Multimedia Fundamentals: Multimedia Elements, Multimedia Applications in Education, Multimedia Development Environments, Basic Multimedia Production
Unit – IV	Digital Editing: Learning Objectives, Digital Editing Overview, Digital Content and Media, Digital editing tools, Editing Digital Text, Editing Digital Audio. Importance of the following: Effective Communication Skills, Creative Problem Solving & Critical Thinking, Collaboration and Teamwork Skills ,

	Innovation & Design Thinking, Use of tools in enhancing skills
Text/Reference Books	
Text Books	1. Volker Lang, Digital Fluency, Apress, 2021 2. Martin Weller, Virtual Learning Environments, Routledge 3. Stephen Quinn, Digital Sub-Editing and Design, Routledge, 2001

BCA/1/SEC2/P: Digital Fluency Lab							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Skill Enhancement Course Practical	01	02	Practical	25	-	3 Hours	Practical/ Viva-voce
Instructions to paper setter for Term-End Examination: The Term-End examination shall be conducted by a panel of one external and one internal examiner. The question paper for practical examination shall be set on the spot							

BCA/2/AEC3/T: Environmental Studies							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Compulsory Course Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

Instructions to paper setter for Term-End Examination: The Term-End examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting FIVE short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of this course is to study about our environment, its layers. Sustainable development of environment how resources related to each other. About various environment pollutions and socio-political issues of environment.

Course Outcomes	At the end of this course, the student will be able to:
CO1	understand ecosystem and its relationship with environment bio cycle.
CO2	understand sustainable development and the concept of renewable resources.
CO3	Design solution about various way to environmental pollutions and their effects
CO4	Apply solution for harmful effects of various pollution in daily life.

Course Content BCA/2/AEC3/T: Environmental Studies	
Unit – I	**Introduction:** Definition, scope and importance: Concept of a neat clean environment, Ecology and Environment, Concept of an ecosystem, Its components and their interrelationships, autotrophs and heterotrophs, food chains, food webs and ecological pyramids, energy flow in the ecosystem, biogeochemical cycles, The concept of biosphere, ecosystem diversity and biodiversity, Global and national concerns, threats to biodiversity and conservation efforts.
Unit – II	**Sustainable development:** The apparent conflict between economic development and sanctity of the environment, Judicious use of resources for their long term viability; forest resources, water resources, mineral resources; food resources, energy resources and land resources, Renewable sources, the practice of 3Rs.
Unit – III	**Environmental pollution:** Air pollution, attributes of air environment; major pollutants, their natural and anthropogenic sources, effects and

	mitigation measures **Water pollution**: attributes of water environment, major categories of pollutants; effects and mitigation measures. **Land pollution**: Urban and industrial solid wastes and their management. **Noise pollution**: Measurement, effects and control of noise pollution.
Unit – IV	**Socio-political issues**: Global concerns, international endeavours and inter-governmental efforts: climate change, global warming, acid rain, ozone layer depletion, international bodies and protocols, Environmental laws and regulations in India.
Text/Reference Books
Text Books	1. Odum, Eugene P. Fundamentals of ecology. Philadelphia: W. B. Saunders Company, 1953. 2. Peary, Rowe, Tchobanoglous Environmental Engineering, McGraw Hill
Reference Books	1. Heywood and Waston, Global Biodiversity Assessment, CPCB.

BCA/2/AEC4/T: ਪੰਜਾਬੀ							
Course Type	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Ability Enhancement Compulsory Course Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
					15 | 5 | 5		

ਟਰਮ-ਐਂਡ ਇਮਤਿਹਾਨ ਲਈ ਪੇਪਰ ਸੇਟਰ ਨੂੰ ਨਿਰਦੇਸ਼: ਟਰਮ-ਐਂਡ ਪ੍ਰੀਖਿਆ ਕੋਰਸ ਦੀ ਸਮੁੱਚੀ ਸਮੱਗਰੀ ਨੂੰ ਕਵਰ ਕਰੇਗੀ। ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਕੁੱਲ ਗਿਣਤੀ ਨੌ ਹੋਵੇਗੀ। ਪ੍ਰਸ਼ਨ ਨੰਬਰ ਇੱਕ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ ਅਤੇ ਪੂਰੇ ਸਲੇਬਸ ਵਿੱਚੋ ਪੰਜ ਛੋਟੇ/ਉਦੇਸ਼-ਪ੍ਰਕਾਰ ਦੇ ਪ੍ਰਸ਼ਨ ਸ਼ਾਮਲ ਹੋਣਗੇ। ਲਾਜ਼ਮੀ ਪਹਿਲੇ ਪ੍ਰਸ਼ਨ ਤੋ ਇਲਾਵਾ, ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਵਿੱਚ ਚਾਰ ਇਕਾਈਆਂ ਹੋਣੀਆਂ ਚਾਹੀਦੀਆਂ ਹਨ, ਹਰ ਇੱਕ ਵਿੱਚ ਦੇ ਪ੍ਰਸ਼ਨ ਹੁੰਦੇ ਹਨ। ਵਿਦਿਆਰਥੀ ਲਾਜ਼ਮੀ ਪ੍ਰਸ਼ਨ ਤੋ ਇਲਾਵਾ ਹਰੇਕ ਯੂਨਿਟ ਵਿੱਚੋ ਇੱਕ ਪ੍ਰਸ਼ਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰੇਗਾ। ਸਾਰੇ ਸਵਾਲਾਂ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹੋਣਗੇ।

ਕੋਰਸ ਦੇ ਉਦੇਸ਼: ਪੰਜਾਬੀ ਪੜ੍ਹਾਉਣ ਨਾਲ ਸਬੰਧਤ ਬੁਨਿਆਦੀ ਧਾਰਨਾਵਾਂ ਬਾਰੇ ਜਾਗਰੂਕਤਾ ਪੈਦਾ ਕਰਨਾ। ਵੱਖ-ਵੱਖ ਭਾਸ਼ਾ ਦੇ ਹੁਨਰਾਂ ਵਿੱਚ ਸਿਖਲਾਈ ਪ੍ਰਦਾਨ ਕਰੋ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਪੜ੍ਹਨ, ਲਿਖਣ, ਬੋਲਣ ਦੇ ਯੋਗ ਬਣਾਓ।

ਕੋਰਸ ਦੇ ਨਤੀਜੇ	ਇਸ ਕੋਰਸ ਦੇ ਅੰਤ ਵਿੱਚ, ਵਿਦਿਆਰਥੀ ਇਹ ਕਰਨ ਦੇ ਯੋਗ ਹੋਵੇਗਾ:
CO1	pMjfbl sLbd rcnf, lgF-mfqrF aq ysLbd joV inXmF df igafn hfisl hovygf.
CO2	ividafrQIaF nUM pMjfbl dIaF ivafkrink sLRyxIaF bfr ymuhfrQ pRfpq hovygl
CO3	pMjfbl ivc ividafrQI nUM suwDpVHx aqy ilKx df igafn hfisl hovygf.
CO4	ividafrQI nUM pMjfbl Dunl aqy awKr boD df igafn pRfpq hovygf.

<p align="center">Course Content
BCA/2/AEC4/T: ਪੰਜਾਬੀ</p>

ਯੂਨਿਟ– I	Dunl/ awKrboD- awKrF dl pCfx, awKr Aucfrn, lgF mfqrfvF, lgfKr, svr- ivaMjn, sLbdjOV.
ਯੂਨਿਟ– II	lvafkrx k sLRyxIaF: nFv, pVnFv, ivsLysx, ikirafivsLysx, kfrk, sbMDk, Xojk, ivsimk aqy inpfq(pfrtlkljL)
ਯੂਨਿਟ – III	arQboD: smfnfrQk sLbd, bhuafrQk sLbd, ivroDfrQk sLbd, ivprIqafrQk sLbd, bhuqysLbdFlel iek sLbd.
ਯੂਨਿਟ– IV	pwqrlyKx/ pYrfrcnf muhfvry/aKfx

<p align="center">ਪਾਠ/ਸੰਦਰਭ ਕਿਤਾਬਾਂ</p>

ਪਾਠ ਪੁਸਤਕਾਂ	1. s. s. Kihrf pMjfbl BfsLf: ivafkrn aq ybxqr, pMjfbl XUnlvristl pitaflf, 1960 2. hrklrq isMG pMjfbl sLbdrUp aqy sLbdjOV kosL, pMjfbl XUnlvristl pitaflf, 2006 3. Auhl pMjfbl BfsLf df ivafrx, pMjfb XUnlvristl, cMzlgVH, 1964 4. ਡਾ: ਹਰਦੇਵ ਸਿਂਘ ਬਾਹਰੀ, ਪੰਜਾਬੀ ਪੜ੍ਹਾਓ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ। 5. ਹੈਨਰੀ ਏ. ਗਲੀਸਨ, ਜੇ.ਆਰ., ਹਰਜੀਤ ਸਿੰਘ ਗਿੱਲ, ਏ ਸਟਾਰਟ ਇਨ ਪੰਜਾਬੀ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।

ਸੰਦਰਭ ਕਿਤਾਬਾਂ	1. ਉੱਜਲ ਸਿੰਘ ਬਾਹਰੀ, ਪ੍ਰਮਜੀਤ ਸਿੰਘ ਵਾਲੀਆ, ਜਾਣ-ਪਛਾਣ ਪੰਜਾਬੀ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ। 2. ਪਦਿਰਜੀਤ ਕੇ. ਗਿੱਲ, ਗੱਲਬਾਤ ਪੰਜਾਬੀ (**gzikphftZurZb-pks**), ਯੂਨੀਸਟਾਰ ਬੁਕਸ ਪ੍ਰਾ. ਲਿਮਟਿਡ, ਚੰਡੀਗੜ੍ਹ।

CSE/GEC1: Fundamentals of Information Technology							
Course Type	Course Credit	Contact Hours/Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
				External	Internal		
Generic Elective Theory	04	04	Lecture	70	30	3 Hours	TEE/MTE/ Assignment/ Attendance

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: This course is aimed at enabling the students appreciate the working of various parts of a digital computers and peripheral devices interfaced with it apart from computer memory devices and computer programming languages' types/levels.

Course Outcomes	At the end of this course, the students will be able to:
CO1	enumerate various types of computers and its components including memory devices, input devices, output devices; software types; programming languages as also define various terms related to information technology discipline.
CO2	describe the working principles of various types of computers and its components including memory devices, input devices, output devices; software types; programming languages and related terms and concepts.
CO3	apply the information and knowledge gained in daily life for academic, research, entertainment, professional and related fields.
CO4	classify and categorize the data, computers, memory devices, input devices, output devices, computer software and computer languages based on various criteria.
CO5	evaluate and justify their requirement in respect of a computer and related hardware/software and make a leaned decision for procuring a computer.

Course Content	
CSE/GEC1: Fundamentals of Information Technology	
Unit - I	Historical evolution of computers, characteristics of computers, capabilities and limitations of computers. Type of computers based on different criteria like processing power, hardware generations, functions, and data processed Description of the terms: hardware, software and firmware. Applications of computers in different fields of public life, Block diagram of computer, its components and their functions.
Unit - II	Number systems - Binary, octal, decimal and Hexa-decimal, Conversion from one number systems to others, binary arithmetic, Boolean algebra/operations, logic gates and digital logic circuits.
Unit - III	Primary memory, RAM and its types, ROM and its types Cache memory, its function and levels Secondary memory: magnetic storage, optical storage, electronic storage. Input devices used with computer systems Output devices used with computer systems.
Unit - IV	Software its types and functions Application software and its examples System software and its examples.

	Computer languages and its types. Operating System, its objectives, functions and modules.
Text/Reference Books	
Text Books	1. Priti Sinha, Pradeep K., Sinha, "Computer Fundamentals: Concepts, Systems & Applications", BPB Publications. 2. V. Rajaraman, "Fundamentals of Computers", PHI. 3. V. Rajaraman, "Introduction to Information Technology", PHI 4. R.K. Taxali "Introduction to Software Packages", Galgotia Publications.
Reference Books	1. Sanders D.H., "Computers Today", McGraw Hill Publications. 2. Ron White, "How Computers Work?", BPB Publications.

CSE/GEC2: Windows and Office Automation Tools

Course Type	Course Component	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
					External	Internal		
Generic Elective	Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
						15	5	5		
	Practical	01	02	Lab	25	-	3 Hours	Practical File/TEE

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Objective of this course is to make the students familiar with the functioning of the Internet, email, web-browsers, and e-commerce; surfing the Internet and downloading contents therefrom; legal and payment issues in e-commerce.

Course Outcomes	At the end of this course, the student will be able to:
CO1	define: installation, basic elements of windows, features of Word processing, Excel, PowerPoint.
CO2	describe: My computer, control panel, accessories in Windows, MS Word features, toolbars, various styles and tools, excel worksheet, data entry, editing, creating graphs, mathematical and statistical functions and formulas.
CO-3	perform: Windows installation, various tools, tables, charts, template in MS Word, Excel & PowerPoint.
CO4	classify: various tabs in MS Word, Excel, PowerPoint, mathematical and statistical functions and formulas in Excel, format and different operations on tables, PowerPoint elements: templates, wizards, views.
CO5	select: various menu options, tools, dialog boxes, slides and slide shows, Windows accessories, control panel, various layouts, various styles.
CO6	design: effective PowerPoint presentations, document creation & report writing in MS Word, statistical data sheets using Excel.

Course Content
CSE/GEC2   Windows and Office Automation Tools

Unit - I	WINDOWS: Installing WINDOWS starting and quitting WINDOWS Basic Elements of WINDOWS , My Computer, Network Neighbourhood, Sharing Devices, Windows Explorer (Files and Folder Operations), Control Panel, Accessories like Accessibility, Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc.
Unit - II	MS-WORD: Basic features of Word Processing, File-New, Open, Save, Print, Close, Page Setup, Edit-Find, Replace, Cut, Copy, Paste etc. View-various layouts, Zooming, Header, Footer, Toolbars, Insert-Various types of objects, Files, Symbols, Date, Time etc, Format-Various Styles, Auto format, Paragraph formatting, Bullets and numbering etc. Tools- Spell Checking, Word Count, Auto Correct, Languages etc, Tables- Insert, Delete, Update, Auto format and different operations on tables, Windows and Help.

Unit - III	EXCEL : Excel worksheet, data entry, editing, cell addressing, ranges, commands, menus, copying & moving cell content, inserting & deleting rows and column, column formats, cell protection, printing, creating, displaying & printing graphs. Mathematical and Statistical Functions and Formulas.
Unit - IV	MS PowerPoint: Introduction, PowerPoint elements -templates, wizards, views, colour schemes. PowerPoint menus options, sub-options, preparing presentation using different tools, working with drawing, templates, dialog boxes, building slides and slide shows.
Text/Reference Books	
Text Books	1. "Computer Concepts Windows and MS Office", Vikas Publishing House ISBN : 8125912398 2. "MS Office in NutShell" Vikas Publishing House ISBN : 8125914463 3. Rathbone Andy, "Windows XP for Dummies", IDG Books India (Published : 9/2001), ISBN : 8126502282.
Reference Books	1. Tyler, Denise, "Windows XP Home And Professional Editions" BPB Publications (Published : 9/2001).

CSE/GEC3: Introduction to Cyber Space								
Course Type	Course Component	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks		Exam Duration	Assessment Methods
					External	Internal		
Generic Elective	Theory	03	03	Lecture	50	25	3 Hours	TEE/MTE/ Assignment/ Attendance
						15 | 5 | 5		
	Practical	01	02	Lab	25	-	3 Hours	Practical File/TEE

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: Objective of this course is to make the students familiar with the functioning of the Internet, email, web-browsers, and e-commerce; surfing the Internet and downloading contents therefrom; legal and payment issues in e-commerce.

Course Outcomes	At the end of this course, the student will be able to:
CO1	define: Internet and its applications, ISP, HTML, Email, Web Browsers, Social Media and E-commerce.
CO2	explain: internet, intranet, internet service provider, HTML, structure and working of email, configuration of mail client like Outlook Express with mail server, functionality of web browsers, social media and concept of E-commerce.
CO-3	illustrate: internet and its applications, evolution of internet, structure of HTML, various tags with their uses in HTML, structure and working of email, concept and use of different type of web browser, searching and downloading from websites, use of social media and introduction to E-commerce
CO4	categorize: applications of internet, ISP, HTML elements, email messaging, function of web browsers, searching software's, various social media networks, their impact and issues and concept of e-commerce with payment issues.
CO5	compare: internet and intranet, different internet service providers on the basis of their service, email advantages and disadvantages, working of various web browsers and social media types.
CO6	design: various types of HTML application with the help of different elements along with their attributes and development of webpages.

Course Content CSE/GEC3: Introduction to Cyber Space	
Unit - I	Basics of internet and Intranet, Applications of Internet, Evolution of Internet, Internet Service Provider (ISP). Introduction to HTML, Structure of HTML, Web Page, Head and Body Sections, General structure of HTML tags-starting and ending a tag, various text formatting tags in HTML, Adding images, audio and video objects, Hyper linking.
Unit - II	Email: Basic Introduction, Advantages and Disadvantage, Structure of an E-Mail Message, Working of E-Mail (sending & receiving messages), Managing Email (creating new folders, deleting messages, forwarding messages, filtering messages), Configuration of Outlook Express.

Unit - III	Introduction to the Functionality of Web Browsers: Internet Explorer, Netscape Navigator Concept of WWW, surfing through web sites. Web Browsing (opening, viewing, saving a web page and book mark). Searching and downloading of different sites and software.
Unit - IV	Introduction to Social Media: Twitter, Facebook, YouTube, Whatsapp, LinkedIn, their advantages/disadvantages and issues.
	Introduction to E-commerce, its history, advantages, challenges, payment issues, legal issues.
Text/Reference Books	
Text Books	4. Ritendra Goel, "e-commerce", New Age International Publisher, 2008 5. Dougals E. Comer, "Computer Network and Internet", Pearson, 2008 6. Thomas A. Powell, "HTML - The Complete Reference", Tata McGraw-Hill, ISBN: 0074633325 7. Khurana R., "HTML", APH Publishing
Reference Books	1. Oliver Heathcote, "Internet Right From The Start" BPB Publications

CSE/GEC4: Information Technology for Lifelong Learning

CoursType pe	Course Component	Course Credit	Contact Hours/ Week	Delivery Mode	Maximum Marks				Exam Duration	Assessment Methods
					External	Internal				
Generic Elective	Theory	03	03	Lecture	50	25			3 Hours	TEE/MTE/ Assignment/ Attendance
						15	5	5		
	Practical	01	02	Lab	25	-			3 Hours	Practical File/TEE

Instructions for Mid-Term examination: The mid-term examination shall cover the first two units of the course content. The question paper will be set by the internal teacher.

Instructions to paper setter for Term-End Examination: The term-end examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective-type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: This course is aimed at empowering students in the internet and related fields,e-Learning and online content writing, moodles, ethical and legal issues in computing profession and preparing technical presentations and plagiarism detection.

Course Outcomes	At the end of this course, the student will be able to:
CO1	list: social media platforms, online learning tools; define: internet, blogs, social media, e-learning, e-content, cyber security, IPR.
CO2	give examples of online searching, online learning, social media, cyber crimes. explain: cyber safety ,cyber privacy, cyber security, IPR.
CO3	use: different social media to post his/her data, internet to post blogs, MOOCs.
CO4	categorize: different online learning tools, e-contents, social media.
CO5	compare social media platform, report writing tools and presentation tools and choose the best suitable one.
CO6	design and develop the new e-content , report and presentation design.

Course Content
CSE/GEC4: Information Technology for Lifelong Learning

Unit - I	Introduction to the Internet & WWW, searching the online content efficiently& safely; social media sites and safety, privacy and other issues in social media access, writing Internet blogs.
Unit - II	Introduction to online learning, e-Learning, and web-based learning; writing content for web-based/online readers; e-content development and delivery; concept of moodle; concepts of MOOCs.
Unit - III	Cyber-crime. cyber-security and Indian cyber-law; intellectual property rights.
Unit - IV	Preparing basic presentations; using basic and advanced presentation designs; Report writing (basic and advanced),

Text/Reference Books

Text Books	1. Karen Markey, Online Searching: A Guide to Finding Quality Information Efficiently and Effectively, Rowman & Littlefield, 2019. 2. Ruth Soukup, How To Blog For Profit: Without Selling Your Soul, Life Well Lived Publications.

	3. Diane Alkins and Desiree Pinder, E-Learning Fundamentals: A Practical Guide, ATD Press, 2015.
	4. Barry G Blundell, Ethics in Computing, Science, and Engineering: A Student's Guide to Doing Things Right, Springer International Publishing, 2020.
	5. ShwetaJaswal Vikram Singh Jaswal, Cyber Crime and Information Technology Act 2000, Regal Publications, 2014.
	6. Lewis Fowler, Powerpoint Presentation Design: How to Create an Effective PowerPoint Presentation that Informs, Educates and Inspires Your Audience, Narratus Publishing, 2012.
	7. Netzley, Guide to Report Writing, Pearson Education India, 2010.
	8. Richard Posner, The Little Book of Plagiarism, Pantheon, 2007.
Reference Books	1. Herrington, A Guide to Authentic e-Learning - Connecting with E-learning, Routledge Publishing, 2010.
	2. Kevin Bowyer, Ethics and computing, Wiley-IEEE Press; 2000.
	3. John Bowden, Writing A Report, 9th Edition: How to Prepare, Write & Present Really Effective Reports, Robinson, 2011.