

Bachelor of Computer Applications (BCA)

Scheme And Syllabus

(NEP-2020)

Effective from

Academic Session 2025-2026

PROGRAMME OUTCOMES OF BCA

- PO 1** Computational Knowledge: Acquire and apply knowledge of computing fundamentals.
- PO 2** Problem Analysis: Identify, interpret and analyze computing problems using fundamental principles of mathematics, computing sciences and relevant domain disciplines.
- PO 3** Design /Development of solutions: Design, develop (coding, testing and implementation) and evaluate software solutions for computing problems, to meet specific requirements with appropriate considerations for public health and safety, in addition to societal and cultural considerations.
- PO 4** Modern Tool Usage: Create, select and apply appropriate techniques, skills, resources and modern computing tools to computational activities, with an understanding of limitations.
- PO 5** Environment and Sustainability: Understand and assess the impact of computing solutions in societal and environmental context, and demonstrate the knowledge and need of sustainable development.
- PO 6** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and develop operational software for enterprises satisfying economic, social and ethical constraints.
- PO 7** Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
- PO 8** Communication Efficacy: Communicate effectively in diverse groups about computing activities, by being able to comprehend, document and present technical information in oral and written form.
- PO 9** Project Management: Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments
- PO 10** Lifelong Learning: Recognize the need and have the ability to engage in independent learning, in the broadest context of technology transformation, for continual development as a computer professional.
- PO 11** Innovation and Entrepreneurship: Identify timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

Semester I

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
				L	T	P	H		EE	IA
1.	COMP-101	DSC-A1	Fundamentals of Computers and Office Productivity Tools	4	0	0	4	4	70	30
2.	COMP-102	DSC-B1	Programming using C	4	0	0	4	4	70	30
3.	COMP-103	MDC- 1	Accounting	3	0	0	3	3	50	25
4.	COMP-151	SEC-1	Fundamentals of Computers and Office Productivity Tools - Lab	0	0	6	6	3	50	25
5.	COMP-152	MC-1	Programming using C-Lab	0	0	8	8	4	70	30
6.		AEC-1	To be chosen from corresponding Pool	-	-	-	-	2	35	15
TOTAL								20	345	155
									Total = 500	

Semester II

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
				L	T	P	H		EE	IA
1.	COMP -201	DSC-A2	Internet and Web Technologies	4	0	0	4	4	70	30
2.	COMP-202	DSC-B2	Data Structures	4	0	0	4	4	70	30
3.	COMP- 203	MDC- 2	To be chosen from Mathematics Pool	-	-	-	-	3	50	25
4.	COMP -251	SEC-2	Internet and Web Technologies- Lab	0	0	6	6	3	50	25
5.	COMP -252	MC-2	Data Structures - Lab	0	0	8	8	4	70	30
6.		I/A/P/C-1	As per HPU Guidelines	-	-	-	-	4	70	30
7.		VAC-1	To be chosen from VAC Pool	-	-	-	-	2	35	15
TOTAL								24	415	185
									Total = 600	

- Student on exit will be awarded undergraduate certificate after securing 44 credits in semester I and II in the relevant discipline.

Fundamentals of Computers and Office Productivity Tools

COMP-101

Max Marks: 100

Credit (Theory) 4

60 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Students will understand fundamental computer concepts, including hardware, software, and basic programming.
- CO2** Develop skills in creating, formatting, and managing professional documents using word processing software.
- CO3** Apply spreadsheet functions for data entry, analysis, and visualization using formulas, charts, and pivot tables.
- CO4** Utilize advanced features of spreadsheets for data validation, sorting, filtering, and importing/exporting data.
- CO5** Create visually appealing and interactive presentations with animations, multimedia, and slide transitions.
- CO6** Implement best practices for designing effective presentations and exporting them for professional use.

SECTION-I

Introduction to Computers: Characteristics, Evolution, Types (Microcomputers, Mainframes, Supercomputers), Block Diagram of a Computer.

Memory & Storage: RAM, ROM, Cache Memory, SSD, USB Flash Drives, Cloud Storage (Basics).

Input & Output Devices: Keyboard, Mouse, Touch Screen, Monitors (LCD, LED), Printers (Inkjet, Laser).

Software & Operating Systems: System Software (Operating Systems), Application Software, Overview of Windows & Linux.

Basic Programming Concepts: Introduction to Machine Language, Assembly Language, High-Level Languages.

SECTION-II

Word Processing Software (Microsoft Word / Google Docs / LibreOffice Writer): Introduction to Word Processing and Its Features; Creating, Saving, and Opening Documents; Formatting Text: Font, Paragraph, Styles, Page Layout; Working with Tables, Columns, and Lists; Insert Images, Shapes, Charts, and Hyperlinks; Header, Footer, Page Numbering, Watermark; Spell Check, Grammar Check, and Thesaurus; Mail Merge and Automated Letter Writing; Printing Documents and Exporting to PDF

SECTION-III

Spreadsheet Software (Microsoft Excel / Google Sheets / LibreOffice Calc): Introduction to Spreadsheets and Their Uses; Creating, Saving, and Formatting Worksheets; Working with Rows, Columns, and Cells; Data Entry, Sorting, and Filtering; Formulas and Functions (SUM, AVERAGE, IF, VLOOKUP, HLOOKUP); Creating and Formatting Charts and Graphs; Conditional Formatting and Data Validation; Pivot Tables and Data Analysis Basics; Importing and Exporting Data.

SECTION-IV

Presentation Graphics Software (Microsoft PowerPoint / Google Slides / LibreOffice Impress): Introduction to Presentation Software; Creating and Managing Slides; Formatting Text, Themes, and Backgrounds; Inserting Images, Shapes, Tables, and Charts; Using Animations and Slide Transitions; Adding Multimedia: Audio and Video; Custom Slide Shows and Slide Master View; Printing Handouts and Exporting Presentations; Best Practices for Effective Presentations.

Text book:

1. Pradeep K. Sinha, Priti Sinha, “Computer Fundamentals”. BPB Publications.
2. Peter Weverka, “Microsoft Office 2021 All-in-One for Dummies”, Wiley, 2023.

Reference book:

1. Rajaraman, V., “Fundamental of Computers”. Prentice Hall India, New Delhi.
2. Joan Lambert, Curtis Frye, “Microsoft Office Step by Step (Office 2021 and Microsoft 365)”, Pearson, 2023.

Note: There will be 5 Parts (A, B, C, D, E) and the examiner shall set 9 questions in total from all the Sections/Blocks (I, II, III, IV) and each question shall carry 14 marks.

- Part A will have 2 questions from Section/Block I of the syllabus and students have to attempt any one.
- Part B will have 2 questions from Section/Block II of the syllabus and students have to attempt any one.
- Part C will have 2 questions from Section/Block III of the syllabus and students have to attempt any one.
- Part D will have 2 questions from Section/Block IV of the syllabus and students have to attempt any one.
- Part E will have 10 short answer questions from all the Sections/Blocks of the syllabus (I, II, III, IV) and the students shall have to attempt 7 in total carrying 2 Marks each.

Programming using C

COMP-102

Max Marks: 100

Credit (Theory) 4

60 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Understand the fundamentals of C programming, including syntax, data types, and operators.
- CO2** Implement input/output operations and control statements for efficient program flow.
- CO3** Utilize arrays and strings for data storage and manipulation in C programs.
- CO4** Develop modular programs using functions, recursion, and pointers.
- CO5** Apply dynamic memory allocation, storage classes, and structures in programming.
- CO6** Perform file handling operations to read, write, and manage data in text and binary files.

SECTION-I

Introductory Concepts: Types of Programming Languages; Introduction to C and Its Features; Structure of a C Program; Desirable Program Characteristics (Readability, Maintainability, Efficiency)

C Fundamentals: C Character Set, Identifiers, and Keywords; Data Types, Constants, and Variables; Declarations and Symbolic Constants; Operators and Expressions (Arithmetic, Unary, Relational, Logical, Assignment, Conditional Operators, Library Functions)

SECTION-II

Data Input and Output: Character Input/Output (getchar(), putchar()); Formatted Input/Output (scanf(), printf()); String Input/Output (gets(), puts()).

Control Statements: Branching: if, if-else, nested if, switch-case; Looping: for, while, do-while; Nested Control Statements; Jump Statements: break, continue, goto.

Arrays and Strings: Defining and Declaring Arrays; Processing One-Dimensional and Multidimensional Arrays; Passing Arrays to Functions; String Handling Functions (strlen(), strcpy(), strcat(), strcmp()).

SECTION-III

Functions in C: Function Definition and Declaration; Function Prototypes; Passing Arguments to Functions (Call by Value, Call by Reference); Recursion in C.

Pointers: Fundamentals of Pointers; Pointer Declarations and Operations; Passing Pointers to Functions; Pointers and One-Dimensional Arrays; Arrays of Pointers.

SECTION-IV

Dynamic Memory Allocation: malloc(), calloc(), realloc(), free().

Storage Classes: Automatic, External, Static, and Register Storage Classes.

Structures and Unions: Defining and Using Structures; Arrays of Structures, Nested Structures; Unions and Differences from Structures

File Handling in C: File Operations (fopen(), fclose(), fprintf(), fscanf(), fputs(), fgets()); File Modes and Working with Text and Binary Files.

Text Book:

1. Byron Gottfried, “Programming with C”, Schaum’s Outlines, Tata McGraw Hill.

Reference Books:

1. Mullis Cooper, “Spirit of C”: Jacob Publications.
2. Yashwant Kanetkar, “Let us C”: BPB.
3. Kerningham B.W. & Ritchie D. M., “The C Programming Language”: PHI

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Internet and Web Technology

COMP-201

Max Marks: 100

Credit (Theory) 4

60 Hours

Course Outcomes (COs)

- CO1** Understand the fundamentals of the Internet and web technologies including protocols, web servers, and client-server architecture.
- CO2** Develop structured web pages using HTML with proper formatting, lists, tables, forms, and multimedia elements.
- CO3** Apply CSS styling techniques to enhance the visual presentation of web pages using various selectors and properties.
- CO4** Manipulate the Document Object Model to dynamically update and control web page content.
- CO5** Develop dynamic web applications using PHP with database integration and basic MySQL operations.

SECTION-I

Introduction to the Internet and its applications, evolution of the World Wide Web (WWW), difference between WWW and the Internet. Intranet vs Internet. Internet protocols: HTTP, HTTPS, FTP, SMTP, IMAP, and POP3. Types of web pages: static, dynamic, and active. Introduction to web servers, URL structure, web browsers, search engines, DNS, proxy servers, and client-server architecture.

SECTION-II

Structure of HTML documents, HTML tags and attributes, semantic elements, and formatting text (font, color, size). Creating and using HTML lists, tables, forms, images, and inserting links, comments, and horizontal rules. Introduction to CSS: external, internal, and inline styles, CSS rules, class selector, div & span tags. Styling properties: font, list, color, text alignment, and background images.

SECTION-III

Introduction to PHP, identifiers, variables, data types, scope of variables, operators, control structures (conditional statements and loops), functions, arrays, superglobals (\$_GET, \$_POST, \$_SESSION, \$_COOKIE), handling user input, and form validation in PHP.

SECTION-IV

Advanced PHP concepts: file handling (reading, writing, uploading files), session and cookie management, error handling and debugging, object-oriented PHP (OOP), connecting PHP with MySQL, performing CRUD operations, prepared statements, and security measures (SQL injection prevention, XSS protection).

Text Books:

1. Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
2. Ramesh Bangia, Multimedia and Web Technology, Firewall Media.

Reference Books:

1. Naveen Kumari, Internet Technologies, Eagle Prakashan, 2015.
2. Uttam K. Roy, Web Technologies, Oxford University Press.
3. Steven Holzner, The Complete Reference PHP, Tata McGraw-Hill.
4. A.S. Godbole & A. Kahate, Web Technologies, 3rd Edition, Tata McGraw-Hill, 2017.
5. R. Greenlaw & E. Hepp, Fundamentals of Internet and WWW, 2nd Edition, Tata McGraw-Hill, 2007.
6. B. Patel & L.B. Barik, Internet & Web Technology, Acme Learning Publisher.
7. Jackson, Web Technologies, Pearson Education, 2008.
8. Wendy Willard, HTML Beginner's Guide, Tata McGraw-Hill.
9. Ivan Bayross, Web Technologies Part II, BPB Publications.

10. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML, and PHP, 4th Edition, BPB Publications, 2013.
11. Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, AJAX Black Book, Wiley India Pvt. Ltd.
12. Naramore & Boronczyk, Beginning PHP, Apache, MySQL Web Development, Wiley India Pvt. Ltd.

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Data Structure

COMP-202

Max Marks: 100

Credit (Theory) 4

60 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Recognize and understand the usage of common data structures.
- CO2** Implement and use common data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
- CO3** Analyze the various data structures and its operations.
- CO4** Evaluate problems involving simple and complex data structures

SECTION- I

Introduction to data structures: Concept, Data type, ADT, Need of Data Structure, Types of Data Structure- Linear Vs. non-linear data structure, Single and Multi-dimensional Arrays, Array Initialization, Array manipulations, Sparse Matrices.

SECTION- II

Stacks- Implementing stack using, Applications of stack, Prefix, Infix and Postfix expressions using stack, Limitations of Array representation of stack, Queues -Array representation of Queue, De-queue, Applications of Queue, Priority Queues; Linked Lists -Singly, Doubly and Circular Lists

SECTION- III

Introduction to Tree, Binary Trees, Binary Search Trees, Operations on BST – create, Insert, delete, Tree traversals- preorder, inorder, postorder, Threaded Binary Trees and AVL Trees.

SECTION- IV

Searching- Linear Search, Binary Search, Comparison of Linear and Binary Search, Sorting -Bubble Sort, Selection Sort, Insertion Sort, Shell Sort, Comparison of Sorting Techniques.

Text book:

1. Seymour Lipschutz, “Data Structures Schaums Series”, Prentice Hall India, New Delhi.

Reference books:

1. E.Horowitz and Shani, “Fundamentals of Computer algorithms”,
2. A.Aho, J.Hopcroft and J.Ullman, “The Design and Analysis of algorithms”,

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Semester I

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3.	COMP-103	MDC- 1	Accounting	3	0	0	3	3	50	25
4.	COMP-151	SEC-1	Fundamentals of Computers and Office Productivity Tools - Lab	0	0	6	6	3	50	25
5.	COMP-152	MC-1	Programming using C-Lab	0	0	8	8	4	70	30
6.		AEC-1	To be chosen from corresponding Pool	-	-	-	-	2	35	15
TOTAL								20	345	155
									Total = 500	

Semester II

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
				L	T	P	H		EE	IA
1.	COMP -201	DSC-A2	Internet and Web Technologies	4	0	0	4	4	70	30
2.	COMP-202	DSC-B2	Data Structures	4	0	0	4	4	70	30
3.	COMP- 203	MDC- 2	To be chosen from Mathematics Pool	-	-	-	-	3	50	25
4.	COMP -251	SEC-2	Internet and Web Technologies- Lab	0	0	6	6	3	50	25
5.	COMP -252	MC-2	Data Structures - Lab	0	0	8	8	4	70	30
6.		I/A/P/C-1	As per HPU Guidelines	-	-	-	-	4	70	30
7.		VAC-1	To be chosen from VAC Pool	-	-	-	-	2	35	15
TOTAL								24	415	185
									Total = 600	

- Student on exit will be awarded undergraduate certificate after securing 44 credits in semester I and II in the relevant discipline.

Programming using C - Lab

COMP-152

Max Marks: 100

Credit (Practical) 4

120 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Develop fundamental programming skills in C, including data types, operators, and expressions.
- CO2** Implement input/output operations, control statements, and looping constructs to solve real-world problems.
- CO3** Utilize arrays and strings for data manipulation and apply functions for modular programming.
- CO4** Demonstrate the use of pointers for efficient memory management and data handling.
- CO5** Apply dynamic memory allocation techniques and work with structures and unions for complex data management.
- CO6** Perform file handling operations to read, write, and manage data using text and binary files.

Section I

- Lab 1** Introduction to the C programming environment, setting up compilers, and writing a simple C program
- Lab 2** Understanding data types, variables, and constants through hands-on coding exercises
- Lab 3** Implementing arithmetic, relational, and logical operators in basic programs
- Lab 4** Writing programs to demonstrate assignment and conditional operators
- Lab 5** Using library functions for mathematical and character operations

Section II

- Lab 6** Writing programs to take user input and display formatted output using scanf() and printf()
- Lab 7** Implementing character input/output functions: getchar(), putchar(), gets(), puts()
- Lab 8** Developing programs using branching statements (if, if-else, nested if, switch-case)
- Lab 9** Implementing looping constructs (for, while, do-while) with real-world applications
- Lab 10** Using jump statements (break, continue, goto) in program execution
- Lab 11** Creating, processing, and passing arrays to functions for numerical computations
- Lab 12** Implementing string handling functions and performing string operations

Section III

- Lab 13** Defining and calling functions with and without arguments
- Lab 14** Demonstrating function prototypes, call by value, and call by reference
- Lab 15** Writing recursive functions for mathematical problems such as factorial and Fibonacci series
- Lab 16** Using pointers to access and manipulate variables and arrays
- Lab 17** Implementing array of pointers and pointer arithmetic operations
- Lab 18** Allocating and deallocating memory dynamically using malloc(), calloc(), realloc(), and free()

Section IV

- Lab 19** Defining and using structures for storing multiple data types
- Lab 20** Creating and manipulating arrays of structures and nested structures
- Lab 21** Implementing unions and understanding their differences from structures
- Lab 22** Performing file operations such as reading, writing, appending data in text and binary files
- Lab 23** Working with file handling functions including fopen(), fclose(), fprintf(), fscanf(), fputs(), and fgets()
- Lab 24** Developing mini-projects to integrate file handling, dynamic memory, and structures

Text Book:

1. Byron Gottfried, “Programming with C”, Schaum’s Outlines, Tata McGraw Hill.

Reference Books:

1. Mullis Cooper, “Spirit of C”: Jacob Publications.
2. Yashwant Kanetkar, “Let us C”: BPB.
3. Kerningham B.W. & Ritchie D. M., “The C Programming Language”: PHI

Note:

1. **For being Practical exam there will be no external paper setting by the Examination Branch.**
2. **There will be 5 Parts (A, B, C, D, E) and the examiner shall set 9 questions in total from all the sections/Blocks (I, II, III, IV) and each question shall carry 14 marks.**
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Part E will have 10 short answer questions from all the Sections/Blocks of the syllabus (I, II, III, IV) and the students shall have to attempt 7 in total carrying 2 Marks each.

Data Structure - Lab

COMP-252

Max Marks: 100

Credit (Practical) 4

120 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

CO1: Implement linear and non-linear data structure operations using C programs

CO2: Solve problems implementing appropriate data structures

CO3: Implement sorting using relevant data structures

CO4: Implement searching and sorting algorithms using relevant data structures

SECTION-I

Lab 1 Implement Two dimensional arrays using C language.

Lab 2 WAP to convert the Sparse Matrix into non-zero form and vice-versa.

Lab 3 WAP to reverse the order of the elements in the stack using additional stack.

Lab 4 WAP to reverse the order of the elements in the stack using additional Queue.

Lab 5 WAP to implement Diagonal Matrix using one-dimensional array.

Lab 6 WAP to implement Lower Triangular Matrix using one-dimensional array.

Lab 7 WAP to implement Upper Triangular Matrix using one-dimensional array.

SECTION-II

Lab 8 Implement Circular Linked list.

Lab 9 Write a c program using Stack operations using Linked List implementation.

Lab 10 Perform Queues operations using Circular Array implementation.

Lab 11 Create and perform different operations on Double-ended Queues using Linked List.

Section-III

Lab 12 WAP to create a Binary Search Tree and include following operations in tree:

(a) Insertion

(b) Deletion by copying

(c) Deletion by Merging

(d) Search a no. in BST

(e) Display its preorder, postorder and inorder traversals Recursively

(f) Display its preorder, postorder and inorder traversals Iteratively

(g) Display its level-by-level traversals

(h) Count the non-leaf nodes and leaf nodes

(i) Display height of tree

(j) Create a mirror image of tree

(k) Check whether two BSTs are equal or not

Lab 13 WAP to create a Binary Tree as per inorder traversal, and implement operations like finding the successor / predecessor of an element, insert an element, inorder traversal.

Lab 14 WAP to implement various operations on BST Tree.

Section-IV

Lab 15 WAP to implement Linear Search.

Lab 16 WAP to implement Binary Search.

Lab 17 WAP to implement Bubble Sort.

Lab 18 WAP to implement Selection Sort.

Lab 19 WAP to implement Insertion Sort.

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Semester I

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
									EE	IA
				L	T	P	H			
1.	COMP-101	DSC-A1	Fundamentals of Computers and Office Productivity Tools	4	0	0	4	4	70	30
2.	COMP-102	DSC-B1	Programming using C	4	0	0	4	4	70	30
3.	COMP-103	MDC- 1	Accounting	3	0	0	3	3	50	25
4.	COMP-151	SEC-1	Fundamentals of Computers and Office Productivity Tools - Lab	0	0	6	6	3	50	25
5.	COMP-152	MC-1	Programming using C-Lab	0	0	8	8	4	70	30
6.		AEC-1	To be chosen from corresponding Pool	-	-	-	-	2	35	15
TOTAL								20	345	155
									Total = 500	

Semester II

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
				L	T	P	H		EE	IA
				1.	COMP -201	DSC-A2	Internet and Web Technologies	4	0	0
2.	COMP-202	DSC-B2	Data Structures	4	0	0	4	4	70	30
3.	COMP- 203	MDC- 2	To be chosen from Mathematics Pool	-	-	-	-	3	50	25
4.	COMP -251	SEC-2	Internet and Web Technologies- Lab	0	0	6	6	3	50	25
5.	COMP -252	MC-2	Data Structures - Lab	0	0	8	8	4	70	30
6.		I/A/P/C-1	As per HPU Guidelines	-	-	-	-	4	70	30
7.		VAC-1	To be chosen from VAC Pool	-	-	-	-	2	35	15
TOTAL								24	415	185
									Total = 600	

- Student on exit will be awarded undergraduate certificate after securing 44 credits in semester I and II in the relevant discipline.

Accounting

COMP-103

Max Marks: 75

Credit (Theory) 3

45 Hours

Course Outcomes (COs)

- CO1** Understand the fundamental principles and conventions of accounting and cost accounting.
- CO2** Record financial transactions using the double-entry system and prepare key financial statements.
- CO3** Analyze and interpret final accounts, including trading, profit and loss accounts, and balance sheets.
- CO4** Apply cost concepts, classification, and marginal costing techniques for business decision-making.

SECTION-I

Accounting: Meaning, Definition and objects of Accounting, Accounting Principles, Accounting concepts and Conventions, Principle of Double Entry System, Journal Entry, Ledger, Cash Book and Subsidiary books.

SECTION-II

Trial Balance, Errors; types of errors and rectification of errors. Final Account: Manufacturing Account, Trading and Profit & Loss Account. Balance Sheet; Marshalling of Balance Sheet, types of Balance Sheet; vertical and horizontal.

SECTION-III

Type of Accounting; Financial Accounting, Cost Accounting and Management Accounting. Distinction of Financial Accounting and Cost Accounting from Management Accounting. Nature and scope of Cost Accounting, Cost Concept and classification of costs. Preparation of Cost Sheet (Statement of Cost). Marginal Costing (BEP and Cost Volume Profit analysis).

Text & Reference Books:

1. Maheswari, S. N., “Fundamentals of Accounting”, Vikas Publishing House.
2. Anthony, R.H. and Roece, J. S., “Accounting Principles”, Homewood Illinois.
3. Hongren, Charles J. and Faster, “Cost Accounting: A Managerial Emphasis”, Prentice Hall International.
4. Gupta, R. L., “Advanced Financial Accounting”, Sultan Chand and Company.
5. Financial Accounting, Cost Accounting and Management Accounting, VK Global Publications Pvt. Ltd.
6. Financial Accounting, Cost Accounting and Management Accounting, Kalyani Publishers

Note: There will be 4 Parts (A, B, C, D) and the examiner shall set 7 questions in total from all the Sections/Blocks (I, II, III) of the syllabus in total.

- Part A will have 2 questions of 12 marks each from Section/Block I of the syllabus and students have to attempt any one.
- Part B will have 2 questions of 12 marks each from Section/Block II of the syllabus and students have to attempt any one.
- Part C will have 2 questions of 12 marks each from Section/Block III of the syllabus and students have to attempt any one.
- Part D will have 10 short answer questions of 2 marks each from all the three Sections/Blocks (I, II, III) of the syllabus and the students shall have to attempt 7 in total.

**Bachelor of Computer Applications
(BCA)
Scheme
And
Syllabus
(NEP-2020)
Effective from
Academic Session 2025-2026**

PROGRAMME OUTCOMES OF BCA

- PO 1** Computational Knowledge: Acquire and apply knowledge of computing fundamentals.
- PO 2** Problem Analysis: Identify, interpret and analyze computing problems using fundamental principles of mathematics, computing sciences and relevant domain disciplines.
- PO 3** Design /Development of solutions: Design, develop (coding, testing and implementation) and evaluate software solutions for computing problems, to meet specific requirements with appropriate considerations for public health and safety, in addition to societal and cultural considerations.
- PO 4** Modern Tool Usage: Create, select and apply appropriate techniques, skills, resources and modern computing tools to computational activities, with an understanding of limitations.
- PO 5** Environment and Sustainability: Understand and assess the impact of computing solutions in societal and environmental context, and demonstrate the knowledge and need of sustainable development.
- PO 6** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and develop operational software for enterprises satisfying economic, social and ethical constraints.
- PO 7** Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
- PO 8** Communication Efficacy: Communicate effectively in diverse groups about computing activities, by being able to comprehend, document and present technical information in oral and written form.
- PO 9** Project Management: Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments
- PO 10** Lifelong Learning: Recognize the need and have the ability to engage in independent learning, in the broadest context of technology transformation, for continual development as a computer professional.
- PO 11** Innovation and Entrepreneurship: Identify timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

Semester I

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
									EE	IA
				L	T	P	H			
1.	COMP-101	DSC-A1	Fundamentals of Computers and Office Productivity Tools	4	0	0	4	4	70	30
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6.		AEC-1	To be chosen from corresponding Pool	-	-	-	-	2	35	15
TOTAL								20	345	155
									Total = 500	

Semester II

Sr. No	Course Code	Course Type	Course Title	Contact Hrs/week				C	Semester End Marks	
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				L	T	P	H			
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2.	COMP-202	DSC-B2	Data Structures	4	0	0	4	4	70	30
3.	COMP- 203	MDC- 2	To be chosen from Mathematics Pool	-	-	-	-	3	50	25
4.	COMP -251	SEC-2	Internet and Web Technologies- Lab	0	0	6	6	3	50	25
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6.		I/A/P/C-1	As per HPU Guidelines	-	-	-	-	4	70	30
7.		VAC-1	To be chosen from VAC Pool	-	-	-	-	2	35	15
TOTAL								24	415	185
									Total = 600	

- Student on exit will be awarded undergraduate certificate after securing 44 credits in semester I and II in the relevant discipline.

Fundamentals of Computers and Office Productivity Tools - Lab

COMP-151

Max Marks: 75

Credit (Practical) 3

90 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Create, format, and enhance professional documents using word processing software, including advanced features like mail merge and document automation.
- CO2** Utilize spreadsheet software for data management and analysis by applying formulas, functions, charts, pivot tables, and conditional formatting.
- CO3** Design and deliver effective presentations using multimedia elements, slide transitions, animations, and layout customization for impactful communication.
- CO4** Apply advanced office productivity tools for document automation, data visualization, and multimedia integration.

SECTION-I

Lab 1 Introduction to Word Processing

- a. Navigating the Word interface, toolbars, and menu options.
- b. Creating, saving, and opening documents in different formats (DOCX, ODT, PDF).

Lab 2 Text Formatting and Page Layout

- a. Applying font styles, colors, and effects.
- b. Adjusting paragraph alignment, line spacing, indentation, and page breaks.

Lab 3 Working with Tables, Lists, and Columns

- a. Creating and formatting tables, bulleted and numbered lists, and multi-column layouts.

Lab 4 Inserting Objects and Hyperlinks

- a. Adding images, shapes, SmartArt, and hyperlinks.

Lab 5 Advanced Word Processing Features

- a. Using headers, footers, page numbering, and watermarks.
- b. Checking spelling, grammar, and using thesaurus tools.

Lab 6 Mail Merge and Document Automation

- a. Creating a mail merge document for letters, labels, and emails.
- b. Using Excel as a data source for merging.

SECTION-II

Lab 7 Introduction to Spreadsheets

- a. Understanding rows, columns, cells, and worksheets.
- b. Creating, saving, and opening spreadsheets.

Lab 8 Data Entry, Formatting, and Editing

- a. Entering and formatting text, numbers, and dates.
- b. Using cell styles, themes, and conditional formatting.

Lab 9 Basic Formulas and Functions

- a. Performing arithmetic operations in spreadsheets.
- b. Using basic functions: SUM, AVERAGE, MAX, MIN, COUNT.

Lab 10 Data Sorting, Filtering, and Validation

- a. Sorting and filtering data using AutoFilter and advanced filters.
- b. Applying data validation (drop-down lists, input restrictions).

Lab 11 Working with Charts and Graphs

- a. Creating bar, line, pie, and scatter charts.
- b. Customizing chart styles, labels, and colors.

Lab 12 Pivot Tables and Data Analysis

- a. Creating and modifying pivot tables.
- b. Performing basic data analysis using pivot charts.

Lab 13 Importing, Exporting, and Printing

- a. Importing data from CSV, text files, and databases.
- b. Exporting data to different formats (PDF, CSV).
- c. Adjusting print settings: margins, headers, footers, and page layout.

SECTION-III**Lab 14 Introduction to Presentation Software**

- a. Navigating the PowerPoint/Google Slides interface.
- b. Creating and managing slides.

Lab 15 Formatting and Customizing Presentations

- a. Applying themes, slide layouts, and background styles.
- b. Using font and paragraph formatting options.

Lab 16 Inserting and Managing Multimedia

- a. Adding images, tables, charts, SmartArt, and shapes.
- b. Inserting audio and video clips.

Lab 17 Animations and Slide Transitions

- a. Applying animations to text and objects.
- b. Using slide transitions for visual effects.

Lab 18 Custom Slide Shows and Slide Master

- a. Using the Slide Master view for design consistency.
- b. Creating custom slide shows and presenter notes.

Lab 19 Finalizing and Exporting Presentations

- a. Printing handouts and notes.
- b. Exporting presentations in different formats (PPTX, PDF, video).

Text Book:

1. Peter Weverka, “Microsoft Office 2021 All-in-One for Dummies”, Wiley, 2023.

Reference Book:

1. Joan Lambert, Curtis Frye, “Microsoft Office Step by Step (Office 2021 and Microsoft 365)”, Pearson, 2023.

Note:

1. For being Practical exam there will be no external paper setting by the Examination Branch.
2. There will be 4 Parts (A, B, C, D) and the examiner shall set 7 questions in total from all the Sections/Blocks (I, II, III) of the syllabus in total.

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- Part C will have 2 questions of 12 marks each from Section/Block III of the syllabus and students have to attempt any one.
- Part D will have 10 short answer questions of 2 marks each from all the three Sections/Blocks (I, II, III) of the syllabus and the students shall have to attempt 7 in total.

Internet and Web Technology - Lab

COMP-251

Max Marks: 75

Credit (Practical) 3

90 Hours

Course Outcomes (COs)

After completing this course, students will be able to:

- CO1** Develop interactive and well-structured web pages using HTML and CSS for styling and layout.
- CO2** Implement dynamic web functionalities using JavaScript for event handling and form validation.
- CO3** Build server-side applications using PHP and MySQL for data storage and retrieval.
- CO4** Integrate HTML, CSS, JavaScript, and PHP to develop a functional web-based project.

Section I

Lab 1: Introduction to HTML

- Basic HTML document structure
- Understanding tags, elements, attributes
- Formatting text (headings, paragraphs, bold, italic, underline)
- **Exercise:** Create a simple webpage with headings and paragraphs

Lab 2: Working with Lists, Tables, and Forms

- Ordered, unordered, and definition lists
- Creating tables (rows, columns, headers, merging cells)
- HTML Forms (text inputs, radio buttons, checkboxes, select dropdowns, textarea, buttons)
- **Exercise:** Build a Contact Form with validation

Lab 3: Inserting Images, Links, and Comments

- Adding images (tag, alt attributes)
- Internal & external links ()
- Adding comments (<!-- comment -->)
- **Exercise:** Create an Image Gallery with navigation

Lab 4: Introduction to CSS

- CSS Selectors (id, class, element)
- External, internal, and inline CSS
- Styling text (fonts, colors, sizes)
- **Exercise:** Style a webpage with different fonts and colors

Lab 5: Styling with CSS

- Box model (margin, padding, border)
- Background images and colors
- CSS positioning (relative, absolute, fixed, sticky)
- **Exercise:** Create a webpage layout using div and span

Lab 6: Responsive Design & Mini Project

- Media queries for responsive design
- Creating a mobile-friendly layout
- **Mini-Project:** Personal Portfolio Website

Section II

Lab 7: Introduction to PHP & Setup

- Install XAMPP/WAMP
- Running PHP scripts (.php file)
- PHP Syntax, Echo & Print
- **Exercise:** Print "Hello, World!" using PHP

Lab 8: Variables, Data Types, and Operators

- Declaring variables
- Data types (string, integer, float, boolean, array)
- Operators (arithmetic, comparison, logical)
- **Exercise:** Create a basic calculator

Lab 9: Conditional Statements & Loops

- If, else, elseif, switch-case
- Loops (for, while, do-while, foreach)
- **Exercise:** Display even and odd numbers using loops

Lab 10: Functions and Arrays

- Creating and using functions
- Passing arguments, returning values
- Arrays (indexed, associative, multidimensional)
- **Exercise:** Store student marks in an associative array and calculate total and average

Lab 11: Superglobals & Form Handling

- \$_GET, \$_POST, \$_SESSION, \$_COOKIE
- Handling form submission
- Sanitizing user input
- **Exercise:** Create a login form with \$_POST method

Lab 12: Form Validation & Mini-Project

- Validating required fields, email, numbers
- Displaying validation errors
- **Mini-Project:** User Registration Form with validation

Section III

Lab 13: File Handling

- Reading and writing files
- Uploading and processing files
- **Exercise:** Create a profile upload system

Lab 14: Sessions and Cookies

- Creating and managing sessions
- Setting and retrieving cookies
- **Exercise:** Build a simple e-commerce cart system

Lab 15: Error Handling and Debugging

- Using try-catch
- Logging errors to a file
- **Exercise:** Implement custom error handling

Lab 16: Object-Oriented PHP (OOP)

- Classes, objects, constructors
- Inheritance, encapsulation
- **Exercise:** Build a user management system with OOP

Lab 17: Connecting PHP with MySQL (CRUD Operations)

- Database connection (mysqli & PDO)
- Performing CRUD (Create, Read, Update, Delete)
- **Mini-Project:** Student Record Management System

Lab 18: Security Measures & Final Project

- Preventing SQL Injection with prepared statements
- Cross-site scripting (XSS) protection

Lab 1 Final Project: Blog System with Authentication & CRUD

Text Books:

1. Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
2. Ramesh Bangia, Multimedia and Web Technology, Firewall Media.

Reference Books:

1. Naveen Kumari, Internet Technologies, Eagle Prakashan, 2015.
2. Uttam K. Roy, Web Technologies, Oxford University Press.
3. Steven Holzner, The Complete Reference PHP, Tata McGraw-Hill.
4. A.S. Godbole & A. Kahate, Web Technologies, 3rd Edition, Tata McGraw-Hill, 2017.
5. R. Greenlaw & E. Hepp, Fundamentals of Internet and WWW, 2nd Edition, Tata McGraw-Hill, 2007.
6. B. Patel & L.B. Barik, Internet & Web Technology, Acme Learning Publisher.
7. Jackson, Web Technologies, Pearson Education, 2008.
8. Wendy Willard, HTML Beginner's Guide, Tata McGraw-Hill.
9. Ivan Bayross, Web Technologies Part II, BPB Publications.
10. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML, and PHP, 4th Edition, BPB Publications, 2013.
11. Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, AJAX Black Book, Wiley India Pvt. Ltd.
12. Naramore & Boronczyk, Beginning PHP, Apache, MySQL Web Development, Wiley India Pvt. Ltd.

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B.A. English Syllabus

Undergraduate Programme

[As per NEP 2020]



**Department of English
Himachal Pradesh University
NAAC Accredited 'A' Grade University
Summer Hill Shimla - 171005**

Semester-I

Course: Foundation Course in English

AEC ENG 115

(Credits 2: Lectures 2; Tutorials 0)

Max Marks: 50 (35-15) Duration of Exam: 1.5 Hours

Course Outcome:

Targeted at any Under-graduate student, the AEC offered here aims at imparting the theoretical know-how of the most commonly used language in the world for communication, both, personal and professional: English. The focus shall be on nurturing the theoretical framework required for a hands-on training of the various aspects of Communicating in English.

Section I

- a Articles
- b Prepositions
- c Conjunctions
- d Verb Forms/Tenses

Section II

- a Narration (Direct and Indirect Speech)
- b Voice (Active and Passive)
- c Paragraph Writing
- d Comprehension

Essential Reading:

Sinha, R. P. *Current English Grammar and Usage with Composition*. Oxford University Press 2017.

Suggested Reading:

Eastwood, John. *Oxford Practice Grammar*. 1992. Oxford University Press, 2nd edition, 10th impression, 1999.

Fluency in English. Part I. Macmillan, 2005.

Martin, Hewing. *Advanced English Grammar*. Cambridge University Press, 2010.

New Headway. Intermediate Student's Book. 3rd Edition. Oxford University Press, 2012.
Units 1-6.

Young, David, J. *Introducing English Grammar*. Routledge, 1984.