

**GOVT. BILASA GIRLS' P.G. COLLEGE, BILASPUR (C.G.)**



**DEPARTMENT OF COMPUTER APPLICATION**

(Bachelor of Computer Application)

**SYLLABUS**

**(B.C.A.)**

**(CBCS Under NEP-2020)**

**SESSION**

**2022-2023**

Bachelor of Computer Application

**(Honors Course)**

(Semester I and II)

**Part A: Introduction**

<b>Program: Certificate Course</b>		<b>Class: BCA 1<sup>st</sup> Semester</b>	<b>Year: 2022</b>	<b>Session:2022-23</b>
1	Course Code			
2	Course Title	<b>Computer Fundamentals</b>		
3	Course Type	<b>Core Course</b>		
4	Pre-requisite (if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Understand the concept of input and output devices and the basic terminologies used in the computer.</li> <li>• Understand the Programming, flow chart symbols, complete and correct flow chart algorithms, create a program based on a flow chart.</li> <li>• Identify categories of programs, system software and applications. Organize and work with files and folders</li> <li>• Utilize the Internet Web resources and evaluate on-line e-business system.</li> <li>• Solve common business problems using appropriate Information Technology applications and systems.</li> </ul>		
6	Credit Values	03		
7	Total Marks	Max. Marks: 100	Min Passing Marks: 33	

**Part B: Content of the Course**

Total No. of Teaching-learning - Hours- 45 / Periods-60

Unit	Topics (Course Contents)	No. of Period/ Hours
I	<b>Basics of Computer:</b> Brief History of Computers, Technical Computer Generations, Types of Computers, Computer Hardware, CPU and its components, Basic input and output devices, Types of Printers, Features of Printers; Plotters, Features of plotters,Memory; Types of Computer Memory, Storage devices: Hard Disk, Floppy Diskette, Data Retrieval and Characteristics; Optical Technology; CD-ROM, CD-ROM operation, DVD-Drive, Tape drive, Pen drive, etc	12 hours
II	<b>Computer Software, Operating System, DOS:</b> Software and its need, Types of Software's: system software, application software, utility software, firmware, Operating System, Functions of operating system (only list), Compiler, Assembler, Interpreter, Debugger, Loader, and Linker; Booting process (with BIOS & POST), DOS,Internal and External commands of MS-DOS.	11 hours
III	<b>Program Planning &amp; Computer Languages:</b> Planning the computer program: algorithm, representation of algorithms, flowchart, flowchart symbols, advantages and limitations of flowchart, Pseudocode: definition, advantages and limitations of pseudocode. Introduction and evolution of programming language, Types of programming language, characteristics of a good programming language, Machine language, Assembly language, High level languages	11 hours
IV	<b>Internet &amp; Application:</b> Internet: Definition, history of internet, basic services of internet,	11 hours

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	uses of internet, internet search engine; World Wide Web. Internet security: firewall, encryption. Web browser. Latest IT trends: Artificial intelligence, Data mining, Cloud computing	
<b>Keywords</b>	Operating System, Input & Output Devices, Current Trends	
<b>Part C: Learning Resource</b>		
Text Books, Reference Books, Other Resources		
<b>Suggested Readings:</b>		
<b>Text Books Recommended-</b>		
<ol style="list-style-type: none"> <li>1. "Computer Fundamentals", P.K. Sinha, BPB Publication</li> <li>2. "Fundamental of computer ", V. Rajaraman, PHI Publication</li> <li>3. "Introduction to information technology", V. Rajaraman, PHI ublication</li> <li>4. "Information Technology today", S. jaiswal</li> <li>5. "Fundamental of IT", Leon and Leon , Leon Tec world</li> <li>6. "Introduction to Information Technology", Aksoy and Denardis, Cengage learning</li> </ol>		
<b>Online resources:</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.ndl.gov.in/">https://www.ndl.gov.in/</a> (National Digital Library of India)</li> <li>2. <a href="https://www.swayam.gov.in/">https://www.swayam.gov.in/</a> ( SWAYAM PORTAL)</li> <li>3. <a href="https://www.doabooks.org/">https://www.doabooks.org/</a> ( Directory of Open Access Books)</li> <li>4. <a href="https://nptel.ac.in/National Programme on Technology Enhanced Learning (NPTEL)">https://nptel.ac.in/National Programme on Technology Enhanced Learning (NPTEL)</a></li> <li>5. <a href="https://epgp.inflibnet.ac.in/E-PG Pathshala">https://epgp.inflibnet.ac.in/E-PG Pathshala</a></li> <li>6. <a href="http://cec.nic.in/cec/(e-Content Courseware in UG Subjects)">http://cec.nic.in/cec/(e-Content Courseware in UG Subjects)</a></li> <li>7. <a href="https://egyankosh.ac.in/">https://egyankosh.ac.in/</a> ( E-Gyankosh)</li> </ol>		

**PART - D: Assessment and Evaluation**

**Suggested Continuous Evaluation Methods:**

<b>Maximum Marks:</b>	<b>100 Marks</b>
<b>Continuous Comprehensive Evaluation (CCE)</b>	<b>20 Marks</b>
<b>Semester End Exam (SEE):</b>	<b>80 Marks</b>

<b>Internal Assessment:</b>		
Continuous		
Comprehensive		
Evaluation (CCE)		
<b>Semester End</b>		
<b>Exam (SEE):</b>		

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**Part A: Introduction**

Program: Certificate Course		Class: BCA 1 <sup>st</sup> Semester	Year: 2022	Session:2022-23
1	Course Code			
2	Course Title	<b>Programming in C</b>		
3	Course Type	<b>Core Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Learn the fundamental programming concepts and methodologies which are essential to create good C programs.</li> <li>• Practice the fundamental programming methodologies in the C programming language via laboratory experiences.</li> <li>• Code, test, and implement a well-structured, robust computer program using the C programming language.</li> <li>• Write reusable modules (collections of functions).</li> </ul>		
6	Credit Values	03		
7	Total Marks	Max. Marks: 100	Min Passing Marks: 33	

**Part B: Content of the Course**

Total No. of Teaching-learning - Hours- 45 / Periods-60

Unit	Topics (Course Contents)	No. of Period/ Hours
I	<b>C Programming Concepts</b> History of C language, C Language Character set. Tokens, Constant, Keywords and Identifiers, Variables Data Types Declaration and Assignment of Variables, Operators and Expressions: Types of Operators, Precedence and Associativity. <b>Control Statements:</b> if, if-else, Looping: while, do-while, for loop, Switch, break and continue, goto statements.	12 hours
II	<b>Arrays, String, Structures and Unions in C</b> <b>Arrays:</b> Definition,Single, Two Dimensional and Multi-dimensional arrays. <b>Strings:</b> Handling of Character Set: Declaration & Initialization of String Variables, String handling functions, <b>Structures and Unions:</b> Definitions, Initialization and Assigning Values to Members, Arrays of Structures and Arrays Within Structures, Union.	11 hours
III	<b>Functions and Pointers</b> User Defined Functions, Functions Definition , Prototypes ,Passing arguments,Calling a Function - Nesting of Functions, Recursion, Pointers: Declaration and Initialization of Pointers, Pointer Expression, Operation on Pointers arithmetic. Arrays of Pointers, Pointer on Pointers. Storage Classes - Automatic, External, Static, Register.	11 hours
IV	<b>File Maintenance in C</b> File Input/Output: Opening and closing a file, file opening modes, Study of file I/O Operations: fopen (), fclose(), fputs (), fgets (),	11 hours

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	fread ( ), fwriteQ, Input / Output Operations on a file, Random access to file.	
<b>Keywords:</b>	Token, Data Type, Loop, Conditional statements, Function, Array, Pointer	

### Part C: Learning Resource

Text Books, Reference Books, Other Resources

#### Suggested Readings:

##### Text Books Recommended-

1. LET US C, Yashwant Kanetkar, BPB PUBLICATIONS
2. The Complete Reference C, Herbert Schildt, Tata McGraw HILL
3. PROGRAMMING IN ANSI C - by E. Balgurusamy - Tata McGraw HILL
4. PROGRAMMINGWITH C. Byron Govtfred, Tata McGraw HILL

##### Reference Books:

1. The "C" Programming Language, Briain W. Kenigham& Dennis Ritchie, Pearson
2. The Spirit of "C"- Henry Mulish, Herbert L. Cooper.
3. Mastering "C" - Crain Bolon.

##### Online Resources:

1. <https://www.ndl.gov.in/> (National Digital Library of India)
2. <https://www.swayam.gov.in/> ( SWAYAM PORTAL)
3. <https://www.doabooks.org/> ( Directory of Open Access Books)
4. <https://nptel.ac.in/>National Programme on Technology Enhanced Learning (NPTEL)
5. <https://epgp.inflibnet.ac.in/E-PG Pathshala>
6. <http://cec.nic.in/cec/>(e-Content Courseware in UG Subjects)
7. <https://egyankosh.ac.in/> ( E-Gyankosh)

### PART - D: Assessment and Evaluation

#### Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Comprehensive Evaluation (CCE)	20 Marks
Semester End Exam (SEE):	80 Marks

<b>Internal Assessment:</b>		
Continuous		
Comprehensive		
Evaluation (CCE)		
<b>Semester End</b>		
<b>Exam (SEE):</b>		

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**Part A: Introduction**

Program: Certificate Course		Class: BCA 1 <sup>st</sup> Semester	Year: 2022	Session: 2022-23
1	Course Code			
2	Course Title	<b>Digital Electronics and Microprocessor</b>		
3	Course Type	<b>Core Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Understand the fundamental concepts and techniques used in digital electronics.</li> <li>• Understand and examine the structure of various number systems and its application in digital design.</li> <li>• Understand, analyse and design various combinational and sequential circuits.</li> <li>• Classify different semiconductor memories.</li> </ul>		
6	Credit Values	04 ( 3Theory + 1 Tutorial)		
7	Total Marks	Max. Marks: 100	Min Passing Marks: 33	

**Part B: Content of the Course**

Total No. of Teaching-learning - Hours- 60 / Periods-80

Unit	Topics (Course Contents)	No. of Period/ Hours
I	<p><b>Background of Digital Electronics</b>                      Digital Signals, Different Type of Numbering System: Decimal, Octal, Binary, Hexadecimal, Conversion from One Number System to Another System, Binary Addition, Binary Subtraction, Binary Complements. One's &amp; Two's Complement, Binary Subtraction Using Two's Complement.                      Logic Gate Basics: OR Gate, AND Gate, NOT Gate, Exclusive-OR (XOR) Gate, Truth Tables for Logic Gates, Truth Tables for Combinational Logic.</p>	15 hours
II	<p><b>Logic families and Boolean Algebra</b>                      Types of Logic Family: RTL, DTL, TTL, Emitter Coupled Logic (ECL) and CMOS Logic Family, Comparison of Different Logic Families                      Boolean algebra, Minimization of Switching Functions: Standard representation of logic function (SOP and POS), Minimization technique- K Map method, don't care combinations.</p>	15 hours
III	<p><b>Combinational and Sequential Circuit</b>  <b>Combinational Circuits:</b> Adder, Subtractor, Encoder, Decoder, Multiplexer (MUX), De-Multiplexer.  <b>Sequential circuits:</b> Definition, Basic flip-flops- SR, JK, T and D, Master Slave Flip Flop, race around condition, Steps in synchronous sequential circuit design: Register, modulo-N counter, Ring counter &amp; Shift counters.</p>	15 hours
IV	<p><b>Microprocessor</b>                      Generic Architecture of Microprocessor, Pin Diagram &amp; Pin Function of Intel 8085 Microprocessor, Instructions Set for Microprocessor, Definition and need of Addressing Mode,</p>	15 hours

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Addressing Modes of Intel 8085 & 8086 Microprocessor, Machine Cycle and Instruction Cycle of Microprocessor, Working of Microprocessor.

**Keywords:** Logic gate, Sequential circuit, Combinational Circuit, Microprocessor

### Part C: Learning Resource

Text Books, Reference Books, Other Resources

Suggested Readings:

#### TEXTBOOKS:

1. "Computer Fundamentals Architecture and Organization", Bram, New Age Techno Press.
2. "Digital Design", Morris Mano, PHI, 3rd Edition, 2006.
3. Malvino A.P, Digital Principles and Applications, Tata McGraw Hill.

#### REFERENCE BOOKS:

1. An Engineering Approach To Digital Design – Fletcher, PHI.
2. Digital Logic – Application and Design – John M. Yarbrough, Thomson 3.
3. Fundamentals of Logic Design – Charles H. Roth, Thomson Publications, 5th Edition, 2004.
4. Digital Logic Applications and Design – John M. Yarbrough, Thomson Publications, 2006.

#### ONLINE RESOURCES:

1. <https://www.ndl.gov.in/> (National Digital Library of India)
2. <https://www.swayam.gov.in/> (SWAYAM PORTAL)
3. <https://www.doabooks.org/> ( Directory of Open Access Books)
4. [https://nptel.ac.in/National Programme on Technology Enhanced Learning \(NPTEL\)](https://nptel.ac.in/National Programme on Technology Enhanced Learning (NPTEL))
5. <https://epgp.inflibnet.ac.in/E-PG Pathshala>
6. [http://cec.nic.in/cec/\(e-Content Courseware in UG Subjects\)](http://cec.nic.in/cec/(e-Content Courseware in UG Subjects))
7. <https://egyankosh.ac.in/> ( E-Gyankosh)

### PART - D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Comprehensive Evaluation (CCE)	20 Marks
Semester End Exam (SEE):	80 Marks

Internal Assessment:

Continuous

Comprehensive

Evaluation (CCE)

Semester End

Exam (SEE):

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**Part A: Introduction**

<b>Program: Certificate Course</b>		<b>Class: BCA 2<sup>nd</sup> Semester</b>	<b>Year: 2022</b>	<b>Session: 2022-23</b>
1	Course Code			
2	Course Title	<b>PC Software Package</b>		
3	Course Type	<b>Core Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>Identify the parts of the Windows operating system and uses of common Windows OS elements.</li> <li>Learn Modern office activities and their software requirements.</li> <li>Create a new Word document and formatting a document using MS-WORD.</li> <li>Create an electronic spreadsheet using MS-Excel, familiarize oneself with Excel's basic and advance features.</li> <li>Learn slide show presentation concepts and explore the Microsoft Office PowerPoint environment.</li> </ul>		
6	Credit Values	03		
7	Total Marks	Max. Marks: 100	Min Passing Marks: 33	

**Part B: Content of the Course**

Total No. of Teaching-learning - Hours- 45 / Periods-60

Unit	Topics (Course Contents)	No. of Period/ Hours
I	<b>WINDOWS</b> Basic Elements of WINDOWS, Features of Windows. Windows Explorer (Files and Folder Operations), Accessories like Accessibility, Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Display Settings, Adjusting Sound, Changing the Date and Time, Changing Language and Region Options, Customizing Folder View Options, Connecting to the Internet: Dial-Up Connections, Installing New Hardware & Printer, Installing & Removing Software, Power Settings.	12 hours
II	<b>Introduction to MS Word</b> Word Processor, MS- Word, Chief Elements of MS-Word. Menus and toolbars, Shortcuts, Opening Files, Saving Files, Formatting page and Setting Margins, Converting files to different formats, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents, Mail Merge.	11 hours
III	<b>Introduction to MS Power Point</b> Creating new Presentation, Power point window and its elements. Different presentation templates, Setting backgrounds, Selecting presentation layouts, Formatting a presentation-Adding style, Color, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Text Formatting in slides. Inserting	11 hours

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	pictures, movies, tables etc. into the presentation, Drawing Pictures using Draw, Setting Animation & transition effect, Adding audio and video, Printing Handouts.	
<b>IV</b>	<b>Introduction to MS Excel</b> Introduction: Spreadsheet & its elements. Applications, Menus & Toolbars, Shortcuts, Working with Spreadsheets-Opening, Saving Files, Setting Margins, Converting files to different formats, Formatting Spreadsheets- Cell, row, column & Sheet, Alignment, Font, Border & shading. Highlighting values, Hiding/Locking Cells: Worksheet formatting - Sheet Name, Row & Column Headers, Row Height, Column Width and Worksheet Sheet Formatting, Graphs, Printing worksheet. Functions and operators.	11 hours
<b>Keywords:</b>	Microsoft Word, Excel, Powerpoint, Windows	
<b>Part C: Learning Resource</b>		
Text Books, Reference Books, Other Resources		
<b>Suggested Readings:</b>		
<b>Text Books Recommended-</b>		
<ol style="list-style-type: none"> <li>1. Comdex Computer Course Kit (windows 7 with office 2010), Gupta Vikas. Dreamtech Publication</li> <li>2. Mastering MS Office 2000, Professional Edition by Courier, BPB Publication</li> <li>3. MS Office 2000 Training Guide by Maria, BPB Publications</li> <li>4. MS Office complete by SYBEX.</li> </ol>		
<b>ONLINE RESOURCES:</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://www.ndl.gov.in/">https://www.ndl.gov.in/</a> (National Digital Library of India)</li> <li>2. <a href="https://www.swayam.gov.in/">https://www.swayam.gov.in/</a> (SWAYAM PORTAL)</li> <li>3. <a href="https://www.doabooks.org/">https://www.doabooks.org/</a> ( Directory of Open Access Books)</li> <li>4. <a href="https://nptel.ac.in/">https://nptel.ac.in/</a> National Programme on Technology Enhanced Learning (NPTEL)</li> <li>5. <a href="https://epgp.inflibnet.ac.in/E-PG Pathshala">https://epgp.inflibnet.ac.in/E-PG Pathshala</a></li> <li>6. <a href="http://cec.nic.in/cec/">http://cec.nic.in/cec/</a> (e-Content Courseware in UG Subjects)</li> <li>7. <a href="https://egyankosh.ac.in/">https://egyankosh.ac.in/</a> ( E-Gyankosh)</li> </ol>		

### PART - D: Assessment and Evaluation

**Suggested Continuous Evaluation Methods:**

<b>Maximum Marks:</b>	<b>100 Marks</b>
<b>Continuous Comprehensive Evaluation (CCE)</b>	<b>20 Marks</b>
<b>Semester End Exam (SEE):</b>	<b>80 Marks</b>

<b>Internal Assessment:</b>	
Continuous	
Comprehensive	
Evaluation (CCE)	
<b>Semester End</b>	
<b>Exam (SEE):</b>	

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**Part A: Introduction**

<b>Program: Certificate Course</b>		<b>Class: BCA 2<sup>nd</sup> Semester</b>	<b>Year: 2022</b>	<b>Session: 2022-23</b>
1	Course Code			
2	Course Title	<b>Programming in C++</b>		
3	Course Type	<b>Core Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Learn the fundamental programming concepts and methodologies which are essential to create good C++ programs.</li> <li>• Practice the fundamental programming methodologies in the C++ programming language via laboratory experiences.</li> <li>• Code, test, and implement a well-structured, robust computer program using the C++ programming language.</li> <li>• Write reusable modules (collections of functions).</li> </ul>		
6	Credit Values	03		
7	Total Marks	Max. Marks: 100	Min Passing Marks: 33	

**Part B: Content of the Course**

Total No. of Teaching-learning - Hours- 45 / Periods-60

Unit	Topics (Course Contents)	No. of Period/ Hours
I	Features of C++, OOP vs. procedure-oriented programming, OOP Concepts: Abstraction, Inheritance, Polymorphism, Data Binding, Encapsulation, Classes, subclasses and Objects; Basics of C++: Data Types and sizes, Variable, Constants and its types, Use of « and » operators, Operators and Expressions Precedence and Order of Evaluation. Program Flow & Decision Control: if, if - else, if - else if, Loop Control: while, do - while, for, break, continue, Case Control: switch, goto	12 hours
II	Binding Data & Functions: Defining a Class, Creating an Object, Scope, Data Abstraction, Data Encapsulation, Inline function, Passing Default arguments in function. Constructors and Destructors: Parameterized & Copy constructor, Member Functions & Methods, Friend Class and Friendly Functions, Returning Objects, Arrays of Objects.	11 hours
III	Polymorphism: Compile time and run time, function and Operator overloading. Rules for Overloading, Operator overloading and its uses: Overloading unary and binary operators, Virtual functions, Rules for Virtual Functions, Pure Virtual Functions, Converting data types: Basic to class type, Class to Basic Type, Class to Another Class Type.	11 hours
IV	Reusing Classes: Inheritance-Base and Derived classes, Inheritance types, Access Modifiers, Multiple & Multilevel Inheritance, Calling Base Class Constructor, Overriding Base Class Members, Exception Handling, Throwing an exception, Catch.	11 hours
<b>Keywords:</b>	Object Oriented Programming, Class, Inheritance, Polymorphism, Object	

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### Part C: Learning Resource

#### Text Books, Reference Books, Other Resources

#### Suggested Readings:

##### Text books:

1. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.
2. Object Oriented Programming in C++, 4th Edition, R.Lafore, SAMS, Pearson Education

##### Reference Books:

1. An Introduction to OOP, 3rd Edition, T. Budd, Pearson Education, 2008.
2. Programming Principles and Practice Using C++, B.Stroutstrup, Addison- Wesley, Pearson Education.
3. Problem solving with C++, 6th Edition, Walter Savitch, Pearson Education, 2007.
4. The Art, Philosophy and Science of OOP with C++, R.Miller, SPD. OP in C++, 3rd Edition, T.Gaddis, J.Walters and G.Muganda, Wiley DreamTech Press.
5. An Introduction to OOP in C++ with applications in Computer Graphics, 2nd Edition, G.M.Seed, Springer. Programming with ANSI C++, B.Trivedi, Oxford Press.

##### ONLINE RESOURCES:

1. <https://www.ndl.gov.in/> (National Digital Library of India)
2. <https://www.swayam.gov.in/> (SWAYAM PORTAL)
3. <https://www.doabooks.org/> (Directory of Open Access Books)
4. <https://nptel.ac.in/> National Programme on Technology Enhanced Learning (NPTEL)
5. <https://epgp.inflibnet.ac.in/E-PG Pathshala>
6. <http://cec.nic.in/cec/> (e-Content Courseware in UG Subjects)
7. <https://egyankosh.ac.in/> (E-Gyankosh)

### PART - D: Assessment and Evaluation

#### Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Comprehensive Evaluation (CCE)	20 Marks
Semester End Exam (SEE):	80 Marks

Internal Assessment:		
Continuous		
Comprehensive		
Evaluation (CCE)		
Semester End		
Exam (SEE):		

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**Part A: Introduction**

Program: Certificate Course		Class: BCA 2 <sup>nd</sup> Semester	Year: 2022	Session: 2022-23
1	Course Code			
2	Course Title	<b>Discrete Mathematics</b>		
3	Course Type	<b>Core Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking, and be able to apply them in problem solving</li> <li>• Be able to use effectively algebraic techniques to analyze basic discrete structures and algorithms.</li> <li>• Understand some basic properties of graphs and related discrete structures, and be able to relate these to practical examples</li> </ul>		
6	Credit Values	04 ( 3Th + 1T)		
7	Total Marks	Max. Marks: 100	Min Passing Marks: 33	

**Part B: Content of the Course**

Total No. of Teaching-learning - Hours- 60 / Periods-80

Unit	Topics (Course Contents)	No. of Period/ Hours
I	Recall of statements and logical connectives, tautologies and contradictions, logical equivalence, algebra of propositions, quantifiers, existential quantifiers and universal quantifiers. Boolean algebra and its properties, algebra of propositions as an example, De Morgan's Laws	15 hours
II	Partial order relations G.L.B., L.U.B. Algebra of electric circuits and its applications. Boolean functions - disjunctive and conjugative normal forms. Boolean's expansion theorem, fundamental forms. Many terminal Networks	15 hours
III	Set, Subsets, Operations on Sets, Arbitrary Cartesian product of sets. Partition of sets, Relations, Equivalence relations, functions, injective, surjective, bijective maps, binary operations.	15 hours
IV	Basic Concept of Graph Theory, Sub graphs, finite and infinite graphs, Isomorphic graphs, Parallel edges and self-loops in a graph, Walk, path and circuit in a graph, Trees and their properties, Binary Trees, Spanning Trees, Directed Trees, Planar graphs, Euler Circuit, Hamiltonian Graph.	15 hours
<b>Keywords:</b>	Graph, Tree, Set, Boolean algebra	

**Part C: Learning Resource**

Text Books, Reference Books, Other Resources

Suggested Readings:

**Text Books Recommended-**

1. "Discrete Mathematical structures with Applications to Computer Science", JP Trembly and R. Manohar, TMH International Edition (Latest Edition)
2. "Graph theory and its application to Engineering and Computer Science", NarsingDeo, PHI (Latest

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Edition)

3. "Advanced Discrete Mathematics" H.K. Pathak, J.P. Chauhan, Shiksha Sahitya Prakashan

### REFERENCE BOOK

1. "Discrete Mathematics", Seymour Lipshutz & Marc Lipson, TMH
2. "Discrete Mathematics and Its Applications", Kenneth H. Rosen, TMH
3. "Discrete Mathematics with Graph Theory" Goodaire and Parmenter, EEE.

### ONLINE RESOURCES:

1. <https://www.ndl.gov.in/> (National Digital Library of India)
2. <https://www.swayam.gov.in/> (SWAYAM PORTAL)
3. <https://www.doabooks.org/> (Directory of Open Access Books)
4. <https://nptel.ac.in/> National Programme on Technology Enhanced Learning (NPTEL)
5. <https://epgp.inflibnet.ac.in/E-PG Pathshala>
6. <http://cec.nic.in/cec/> (e-Content Courseware in UG Subjects)
7. <https://egyankosh.ac.in/> (E-Gyankosh)

### PART - D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	100 Marks
Continuous Comprehensive Evaluation (CCE)	20 Marks
Semester End Exam (SEE):	80 Marks

Internal Assessment:		
Continuous		
Comprehensive		
Evaluation (CCE)		
Semester End		
Exam (SEE):		

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**Part A: Introduction**

<b>Program: Certificate Course</b>		<b>Class: BCA 2<sup>nd</sup> Semester</b>	<b>Year: 2022</b>	<b>Session: 2022-23</b>
1	Course Code			
2	Course Title	<b>Computer Fundamentals Lab</b>		
3	Course Type	<b>Laboratory Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Learn basic operations/ functioning of Computer</li> <li>• Able to learn operating system (Windows/DOS)</li> <li>• Able to learn basic computer configuration and settings.</li> <li>• Able to create algorithms and design flowchart.</li> </ul>		
6	Credit Values	<b>01</b>		
7	Total Marks	Max. Marks:50	Min Passing Marks: 17	

**Part B: Content of the Course**

Total No. of Teaching-learning Hours- 30

Section	Topics (Course Contents)	No. of Period/ Hours
A	<ol style="list-style-type: none"> <li>1. Basic operations on computer</li> <li>2. Configuring Computer System</li> <li>3. Control Panel Settings</li> <li>4. System Tools.</li> <li>5. Network Management.</li> <li>6. DOS- Internal and External Commands.</li> <li>7. Windows Installation.</li> <li>8. Writing algorithms and flowchart</li> <li>9. Search Engine, Web browsing</li> </ol>	30 hours

**Keywords:** DOS, MS-WORD, MS-EXCEL, MS-POWER POINT**Part C: Learning Resource**

Text Books, Reference Books, Other Resources

Suggested Readings:

1. "Computer Fundamentals", P.K. Sinha, BPB Publication
2. "Fundamental of computer ", V. Rajaraman, PHI Publication

**Part D: Assessment & Evaluation**

- Examination of Lab course shall be conducted in combination with BCASCC-4P at the end of Sem.-II
- Exam pattern shall be followed to computer laboratory norms and questions will be determined by the department /teacher concerned.
- Marks distribution in each course shall be determined by the department / course tutor following the guidelines of NEP-20.

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Part A: Introduction			
Program: Certificate Course		Class: BCA 2 <sup>nd</sup> Semester	Year: 2022
		Session: 2022-23	
1	Course Code		
2	Course Title	PC Software Lab	
3	Course Type	Laboratory Course	
4	Pre-requisite(if any)	As per Govt. Norms	
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Learn Modern office activities and their software requirements.</li> <li>• Create a new Word document and formatting a document using MS-WORD.</li> <li>• Create an electronic spreadsheet using MS-Excel, familiarize oneself with Excel's basic and advance features.</li> <li>• Create slide show presentation and explore the Microsoft Office PowerPoint environment.</li> </ul>	
6	Credit Values	01	
7	Total Marks	Max. Marks:50	Min Passing Marks: 17

### Part B: Content of the Course

Total No. of Teaching-learning Hours-30

Section	Topics (Course Contents)	No. of Hours
B	<p><b>MS WORD:</b> Basic formatting, Paragraph formatting, Page formatting. Home, Insert, Draw, Design, Layout, Mailing tab. Print Options.</p> <p><b>MS POWER POINT:</b> Creating Presentations, Addition and formatting slides. Effects and Animation. Slide Show, Recording</p> <p><b>MS EXCEL:</b> Operators in MS EXCEL, basic operations on cell, Using functions, Graph and Charts.</p>	30 hours
<b>Keywords:</b>	DOS, MS-WORD, MS-EXCEL, MS-POWER POINT	

### Part C: Learning Resource

Text Books, Reference Books, Other Resources

#### Text Books Recommended-

1. Comdex Computer Course Kit (windows 7 with office 2010), Gupta Vikas. Dreamtech Publication
2. Mastering MS Office 2000, Professional Edition by Courier, BPB Publication
3. MS Office 2000 Training Guide by Maria, BPB Publications

### Part D: Assessment & Evaluation

- Examination of Lab course shall be conducted in combination with BCASCC-1P at the end of Sem.-II
- Exam pattern shall be followed to computer laboratory norms and questions will be determined by the department /teacher concerned.
- Marks distribution in each course shall be determined by the department / course tutor following the guidelines of NEP-20.

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**Part A: Introduction**

<b>Program: Certificate Course</b>		<b>Class: BCA 2<sup>nd</sup> Semester</b>	<b>Year: 2022</b>	<b>Session: 2022-23</b>
1	Course Code			
2	Course Title	<b>Programming Lab in C</b>		
3	Course Type	<b>Laboratory Course</b>		
4	Pre-requisite(if any)	As per Govt. Norms		
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Learn the fundamental programming concepts and methodologies which are essential to create good C programs.</li> <li>• Practice the fundamental programming methodologies in the C programming language via laboratory experiences.</li> <li>• Code, test, and implement a well-structured, robust computer program using the C programming language.</li> <li>• Write reusable modules (collections of functions).</li> </ul>		
6	Credit Values	<b>01</b>		
7	Total Marks	Max. Marks: 50	Min Passing Marks: 17	

**Part B: Content of the Course**

Total No. of Teaching-learning Hours- 30

Section	Topics (Course Contents)	No. of Hours
A	<ol style="list-style-type: none"> <li>1) If a five digit number is input through the keyboard, write a program to reverse the number, print the sum and product of digit.</li> <li>2) WAP to interchange the content of two variable (swapping).</li> <li>3) WAP to convert and print the distance in meter, feet, inches and centimeter if distance is input through the keyboard.</li> <li>4) WAP a to check whether a year entered through keyboard is a leap year or not.</li> <li>5) WAP to check whether a number is even or odd.</li> <li>6) WAP to determine whether entered character is a capital or small or digit or special symbol.</li> <li>7) WAP to find the factorial value of any number entered through keyboard.</li> <li>8) WAP to compute the sum of the first n terms of the following series  <math>S = 1 + 1/2 + 1/3 + 1/4 + \dots</math></li> <li>9) WAP to compute the sum of the first n terms of the following series  <math>S = 1 - 2 + 3 - 4 + 5 - \dots</math></li> <li>10) WAP to print all prime numbers from 1 to 100.</li> <li>11) WAP to print a triangle of stars as follows (take number of lines from user):  <pre> * *** ***** ***** ***** </pre> </li> <li>12) Write a menu driven program using switch which has</li> </ol>	30 hours

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following option:

- I) Factorial of number
  - II) Prime or Not
  - III) Odd or Even
- 13) Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
- 14) Write a function to implement question number one (1) to seven (7) in above list.
- 15) WAP to perform following operations on strings:
- a) Concatenate two strings.
  - b) Compare two strings
  - c) Calculate length of the string
  - d) Convert all lowercase characters to uppercase
  - e) Convert all uppercase characters to lowercase
  - f) Calculate number of vowels
  - g) Reverse the string
- 16) Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Initialize the structure and print the initialized value on screen.
- 17) WAP to explain pointer arithmetic.
- 18) WAP to explain the concept of call by value and call by address mechanism.
- 19) WAP to read Content of file and print them on screen.
- 20) WAP to copy content of one file into another.
- 21) WAP to explain following function-  
**fopen ()**, **fclose ()**, **fputs ()**, **fgets ()**, **fread ()**, **fwrite ()**

**Keywords:** Conditional statements, looping, Array.

### Part C: Learning Resource

Text Books, Reference Books, Other Resources

Suggested Readings:

#### Text Books Recommended-

1. LET US C, Yashwant Kanetkar, BPB PUBLICATIONS
2. The Complete Reference C, Herbert Schildt, Tata McGraw HILL
3. PROGRAMMING IN ANSI C - by E. Balgurusamy - Tata McGraw HILL

### Part D: Assessment & Evaluation

- Examination of Lab course shall be conducted in combination with BCASCC-5P at the end of Sem.-II
- Exam pattern shall be followed to computer laboratory norms and questions will be determined by the department /teacher concerned.
- Marks distribution in each course shall be determined by the department / course tutor following the guidelines of NEP-20.

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Part A: Introduction			
Program: Certificate Course	Class: BCA 2 <sup>nd</sup> Semester	Year: 2022	Session: 2022-23
1	Course Code		
2	Course Title	Programming Lab in C++	
3	Course Type	Laboratory Course	
4	Pre-requisite(if any)	As per Govt. Norms	
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>• Learn the fundamental programming concepts and methodologies which are essential to create good C++ programs.</li> <li>• Practice the fundamental programming methodologies in the C++ programming language via laboratory experiences.</li> <li>• Code, test, and implement a well-structured, robust computer program using the C++ programming language.</li> <li>• Write reusable modules (collections of functions).</li> </ul>	
6	Credit Values	01	
7	Total Marks	Max. Marks: 50	Min Passing Marks: 17

### Part B: Content of the Course

Total No. of Teaching-learning Hours- 30

Section	Topics (Course Contents)	No. of Hours
A	<ol style="list-style-type: none"> <li>1) Write a C++ program to find the sum of individual digits of a positive integer.</li> <li>2) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.</li> <li>3) Write a C++ program to generate the first n terms of the sequence.</li> <li>4) Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.</li> <li>5) Write C++ programs that use both recursive and non-recursive functions               <ol style="list-style-type: none"> <li>a) To find the factorial of a given integer,</li> <li>b) To find the GCD of two given integers,</li> <li>c) To find the n<sup>th</sup> Fibonacci number.</li> </ol> </li> <li>6) Write a C++ program that uses a recursive function for solving Towers of Hanoi problem.</li> <li>7) Write a C++ program to find both the largest and smallest number in a list of integers.</li> <li>8) Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:               <ol style="list-style-type: none"> <li>a) Reading a matrix,</li> <li>b) Printing a matrix,</li> <li>c) Addition of matrices</li> <li>d) Subtraction of matrices.</li> <li>e) Multiplication of matrices.</li> </ol> </li> <li>9) Write a C++ Program to Explain concept of CLASS</li> </ol>	30 hours

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- 10) Write a C++ program to explain function overloading.
- 11) Write a C++ program to overload + operator.
- 12) Write a C++ program to explain Constructor, parameterized Constructor, Copy Constructor.
- 13) Write a C++ program to explain Destructor.
- 14) Write a C++ program to explain Inheritance.
- 15) Write a C++ program to implement polymorphism.

**Keywords:** Class, object, Inheritance

**Part C: Learning Resource**

Text Books, Reference Books, Other Resources

**Suggested Readings:****Text Books Recommended-**

1. An Introduction to OOP, 3rd Edition, T. Budd, Pearson Education, 2008.
2. Programming Principles and Practice Using C++, B. Stroustrup, Addison-Wesley, Pearson Education.
3. Problem solving with C++, 6th Edition, Walter Savitch, Pearson Education, 2007.
4. Database Systems Concepts, A Silberschatz, H F. Korth & S. Sudarshan, McGraw-Hill.

**Part D: Assessment & Evaluation**

- Examination of Lab course shall be conducted in combination with BCASCC-2P at the end of Sem.-II
- Exam pattern shall be followed to computer laboratory norms and questions will be determined by the department / teacher concerned.
- Marks distribution in each course shall be determined by the department / course tutor following the guidelines of NEP-20.

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