ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA, BILASPUR (C.G)

(Established by Chhattisgarh Legislative Assembly Act No. 07 of 2012)

Scheme and Syllabus

of

Bachelor of Computer Application (BCA)

Year- First

W.E.F. Session:- 2023-24

Syllabus Approved by the Central Board of Studies

Learning Outcome Based Scheme and Syllabus of Examination

for

Bachelor of Computer Application (BCA)

Courses Effective from Academic Session 2022-23

1. **Title of the program:** The title of the programme shall be Bachelor of Computer Application (B.C.A.).
2. **Eligibility for admission:** Eligibility of admission in BCA will be as follow:
   i. Student must passed H.Sc. (Class 12th) in any stream/Three year diploma course in any branch of technical education or equivalent from recognized board.
   ii. Student must have minimum aggregate of 40% marks in H.Sc. examination (Relaxation in percentage will be as per rule of C.G. Govt.).
3. **Scheme of examination:** Each theory paper is divided into two components as follow, however there shall not be any Internal Assessment (IA) for practical subject.
   i. University Examination (UE): 75 Marks
   ii. Internal Assessment (IA): 25 Marks
4. **Internal Assessment (IA):** The structure of IA shall be as follow:
   i. **Internal test (15 Marks):** There shall be three internal tests of 15 marks each, the average of best two shall be considered as the marks of internal test.
   ii. **Other activity (10 Marks):** Presentation/Group discussion /Assignment/ MOOC course certification (List of MOOC course shall be provided to the students through notice board/college website by the HOD concern after mapping it from SWAYAM, Coursera or any other similar popular platforms at the beginning of each academic session) or any other similar activity.
5. **University Examination (UE):** The pattern of examination shall be as follow:
   i. There shall be two sections of question paper: A and B
   ii. Section A (15 Marks) shall be compulsory and shall consists 15 short/objective questions each of one mark covering the entire syllabus.
   iii. Section B (60 Marks) shall consist questions from 5 unites as per the syllabus with internal choice (Student has to attempt only one question from each unit). Each unit shall be of 12 marks.

6. **Programme Learning Outcomes for Bachelor of Computer Application (BCA)**

On completion of this programme, the students are expected to:

PLO1: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

PLO2: Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PLO3: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

PLO4: Demonstrate knowledge and understanding of the 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.

PLO5: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PLO6: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PLO7: Develop software projects in various languages as per the demand of the market.

PLO8: Work on research based projects.

PLO9: Develop live software projects and will be capable of working in IT companies.

PLO10: Explore and gain new knowledge through MOOC courses.
PLO11: Ability to pursue higher studies of specialization and to take up technical employment.
PLO12: Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
PLO13: Apply standard Software Engineering practices and strategies in real-time software project development.
PLO14: The ability to work independently on a substantial software project and as an effective team member.
PLO15: Ability to operate, manage, deploy and configure software operation of an organization.

Scheme of BCA

Year	Course Code	Subject Name	Theory/ Practical	Total Credit	Marks			
					UE	IA	Total	
					Max	Max	Max	Min
First	BCA-1T	Discrete Mathematics	Theory	6	75	25	100	33
	BCA-2T	Computer Fundamental and MS office	Theory	4	75	25	100	33
	BCA-3T	Programming with C and C++	Theory	4	75	25	100	33
	BCA-4T	Data Structure	Theory	6	75	25	100	33
	BCA-5T	Digital Electronics	Theory	6	75	25	100	33
	BCA-6T	Hindi	Theory	5	50	-	50	17
	BCA-7T	English	Theory	5	50	-	50	17
	BCA-1P	LAB 1: PC software	Practical	2	100	-	100	33
	BCA-2P	LAB 2: Programming with C and C++	Practical	2	100	-	100	33

Note:

1. Syllabus of Foundation Courses: Hindi and English shall be similar to B.Sc. Computer Science/IT program.
2. Students has to pass environment studies subject as per the rule of any other B.Sc. program.
3. There shall be four extra credits in all the years of under graduation for internship/apprenticeship/skill development program. The certificate of extra credits would be provided by the concern university and is not mandatory.

Abbreviations used:

UE: University Exam
IA: Internal Assessment

बी.ए./ बी.एस-सी./ बी.कॉम./ बी.एच.एस.सी. भाग -एक

(आधार पाठ्यक्रम)

प्रथम प्रश्नपत्र

हिंदी भाषा

कोड....

पूर्णांक 75

क्रेडिट 05

पाठ्यक्रमका उद्देश्य:-

1.हिंदी भाषाके प्रयोजनात्मक स्वरूप का सामान्य ज्ञान प्रदान करना।
2.कंप्यूटर में हिंदी भाषा के प्रयोग की आवश्यकता के अनुरूप कंप्यूटर की कार्य प्रणाली की आरंभिक जानकारी से अवगत होने के लिए प्रेरित करना।
3.हिंदी व्याकरण की बुनियादी ज्ञान संप्रेषण कौशल तथा भाषायी दक्षता से अवगत कराना।
4.साहित्य और समाज को समझने की दिशा में रुझान उत्पन्न करना।

पाठ्य विषय:-

इकाई 1. (क) पल्लवन, पत्राचार, अनुवाद (ख) एक टोकरी भर मिट्टी : माधवराव सप्रे बड़े भाई साहब : प्रेमचंद	अंक 15 18 कालखंड
इकाई 2. (क) संक्षेपण, हिंदी में संक्षिप्तिकरण, हिंदी-अपठित गद्यांश, पारिभाषिक शब्दावली, हिंदी में पदनाम, मुहावरे एवंलोकोक्तियाँ (ख) जागो फिर एक बार: सूर्यकांत त्रिपाठी 'निराला' जन्मदिन ('मिट्टी से कहूँगाधन्यवाद' संग्रह से):एकांत श्रीवास्तव	अंक 15 18 कालखंड
इकाई 3. (क) शब्द-शुद्धि, वाक्य-शुद्धि, शब्द-ज्ञान- पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी-शब्द, समश्रुत शब्द, अनेक शब्दों के लिए एक शब्द (ख) भोलाराम का जीव : हरिशंकर परसाई जीप पर सवार इल्लियां: शरद जोशी	अंक 15 18 कालखंड
इकाई 4.(क) मानक भाषा का अर्थ, मानक हिंदी भाषाका अर्थ, स्वरूप,	अंक 15

23.02.2023 23/2/23 23/2/23 23/2/23 23.2.2023

विशेषताएँ, मानक, उपमानक, अमानक-भाषा (ख)शिकागो से स्वामी विवेकानंद का पत्र सत्य और अहिंसा : महात्मा गांधी	18 कालखंड
इकाई 5. (क) देवनागरी लिपि- नामकरण, स्वरूप, विशेषताएँ, कंप्यूटर का सामान्य परिचय, कंप्यूटर में हिंदी का अनुप्रयोग। (ख)कछुआ-धरम : चन्द्रधर शर्मा 'गुलेरी' छत्तीसगढ़ का वैभव: हीरालाल शुक्ल	अंक 15 18 कालखंड

मूल्यांकन योजना:-

प्रत्येक इकाई से एक-एक प्रश्न पूछे जाएंगे। एक प्रश्न के 15 अंक होंगे। प्रत्येक प्रश्न में आंतरिक विकल्प होगा। प्रत्येक प्रश्न के दो भाग 'क' और 'ख' होंगे एवं अंक क्रमश:08 एवं 07 होंगे। प्रश्नपत्र का पूर्णांक75 निर्धारित है।

प्रश्नपत्रकेपूर्णांककादसप्रतिशतअंकआंतरिकमूल्यांकनकेलिएनिर्धारितहै।

पाठ्यक्रम अधिगम परिणाम:-

इस पाठ्यक्रम को पूर्ण करने के पश्चात विद्यार्थी:-

1.हिंदी प्रयोजनात्मक तथा कार्यशील भाषा के प्रति सजग होंगे।

2.भाषा संबंधी संभावित अशुद्धियों एवं उनके परिष्कारसे परिचित होंगे तथा मानक भाषा का व्यवहार करने में सक्षम होंगे।

3.विद्यार्थियों के शब्द भंडार में वृद्धि होगी।

4.हिंदी साहित्य के पठन-पाठन के प्रति रुचि जागृत होगी एवं सामाजिक महत्व के विविध आयामों को समझने की दृष्टि विकसित होगी।

पाठ्यक्रम निर्माण का औचित्य:-

23/2/23

23.2.23

23/2/23

23.2.2023

Central Board of Studies Foundation Course Paper-II
English Language for Under Graduate Students

Programme Outcomes for English Language B.A/B.Sc/B.Com I, II, III

The programme enables a student to get acquainted

- With the rich cultural heritage and develops patriotic feelings through the works of Indian authors & poets.
- To get exposure of the usage of grammar according to contemporary times.
- To have an exposure about the literary genre with the help of the authors & poets across the globe.
- To develop an appreciation for English Language & Communication Skills.

21/6/23
(PC Choudhury)

(Dr. Sushama Mishra)

Learning Outcomes (English Language) B.A/B.Sc/B.Com - I, II,III

The learning outcomes are as follows:

1. To strengthen the linguistic skills -Listening, Speaking, Reading and Writing.
2. To refine the way of thinking and speaking which would lead them to have mighty ideas in day to day life.
3. To improve students speaking ability in English both in terms of fluency and comprehensibility.
4. To enhance practical use of English in day-to-day life.
5. To enrich the vocabulary of the students.

Dr. Sushama Mishra 12.6.2023

2/6/23

Programme Specific Outcomes FC_ Paper-II (English Language) B.A/B.Sc/B.Com - I, II,III

The Programme Specific outcomes are as follows:

1. To develop abilities of the students as a critical reader and writer.
2. To develop the ability of public interaction and speaking.
3. To develop self awareness about English language.
4. To develop critical thinking .

To give a practice in writing, drafting of English assignments.

Dr. Sushama Mishra

2/6/23

BA/B.Sc./B.Com/B.Sc. Home.Sc. (Part-I)
Foundation Course Paper-II English Language

Max. Marks:75 Qualifying Marks:26
Total credits: 05

Paper-II	Mark's	Period's	Credit
Unit-I **Flamingo : A Textbook for college students** **Publication : Macmillan Publishers**	3x5=15	18	01
Unit -II • Writing Skill • Describing a place or a person. • Writing a Biographical Sketch • Narrating an event or experience	1x10=10	18	01
Unit -III Reading Comprehension • (a) Unseen Passage (Normal) • (b) Vocabulary (Text-based)	1x5=05 1xl0=10	18	01
Unit -III Reading Comprehension (a) Unseen Passage (Normal) (b) Vocabulary (Text-based)	1x5=5 1x5=5	09	0.5
Unit-V Grammar • Articles • Gerunds /Participles • Subject Verb Agreement • Use of Conjunctions • Tenses • Relatives • Possessives & self forms • Grammatical items given in Textbook 'Flaminso'	1x25=25	27	1.5
Total	75	90	05
Recommended Books- 1. Essential English Grammar, 2nd Edition by Raymond Murphy, Cambridge Publication 2. English Grammar in use 5th edition by Raymond Murphy, Cambridge Publication. 3. Advanced English Grammar by Martine Hewings Cambridge University Press.			

Dr. Sushama Mishra

2/6/23

Part A: Introduction				
Program: **Certificate Course**		Class: **BCA I Year**	Year: **2022**	Session:**2022-2023**
1.	Course Code	**BCA-1T**		
2.	Course Title	**Discrete Mathematics**		
3.	Course Type	**Theory**		
4.	Pre-requisite (if any)	Knowledge of basic mathematics.		
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Learn about partially ordered sets, lattices and their types. • Understand Boolean algebra and Boolean functions, logic gates, switching circuits and their applications. • Solve real-life problems using finite-state and Turing machines. • Assimilate various graph theoretic concepts and familiarize with their applications.		
6.	**Credit Value**	**Theory: 6**		
7.	**Total Marks**	**Max. Marks: 25+75**	**Min Passing Marks : 33**	

Part B: Content of the Course		
Total Periods: 90		
Unit	Topics	No. of Periods
I.	**Partially Ordered Sets:** Definitions, examples and basic properties of partially ordered sets (Poset), Order isomorphism, Hasse diagrams, Dual of a poset, Duality principle, Maximal and minimal elements, Least upper bound and greatest upper bound, Building new poset, Maps between posets.	18
II.	**Lattices:** Lattices as posets, Lattices as algebraic structures, Sublattices, Products and homomorphisms; Definitions, examples and properties of modular and distributive lattices; Complemented, relatively complemented and sectionally complemented lattices.	18
III.	**Boolean Algebras and Switching Circuits:** Boolean algebras, De Morgan's laws, Boolean homomorphism, Representation theorem; Boolean polynomials, Boolean polynomial functions, Disjunctive and conjunctive normal forms, Minimal forms of Boolean polynomials, Quine–McCluskey method, Karnaugh diagrams, Switching circuits and applications.	18
IV.	**Finite-State and Turing Machines:** Finite-state machines with outputs, and with no output; Deterministic and nondeterministic finite-state automaton; Turing machines: Definition, examples, and computations.	18
V.	**Graphs:** Definition, examples and basic properties of graphs, Königsberg bridge problem; Subgraphs, Pseudographs, Complete graphs, Bipartite graphs, Isomorphism of graphs, Paths and circuits, Eulerian circuits, Hamiltonian cycles, Adjacency matrix, Weighted graph, Travelling salesman problem, Shortest path and Dijkstra's algorithm.	18
Keywords: Set, Lattices, Switching Circuit, Bipartile, Path, Circuit, Lattices, Boolean algebra, Turing Machine, finite state, Graph.		

Part C - **Learning Resource**

Text Books, Reference Books, Other Resources

Suggested Readings:

1. B. A. Davey & H. A. Priestley (2002). Introduction to Lattices and Order (2nd edition). Cambridge University Press.
2. Edgar G. Goodaire & Michael M. Parmenter (2018). Discrete Mathematics with Graph Theory (3rd edition). Pearson Education.
3. Rudolf Lidl & Günter Pilz (1998). Applied Abstract Algebra (2nd edition). Springer.
4. Kenneth H. Rosen (2012). Discrete Mathematics and its Applications: With Combinatorics and Graph Theory (7th edition). McGraw-Hill.
5. C. L. Liu (1985). Elements of Discrete Mathematics (2nd edition). McGraw-Hill.

E Resources:

- Topics Related to Discrete Mathematics from SWAYAM/NPTEL
  1. https://onlinecourses.swayam2.ac.in/cec20_ma02/preview
  2. https://youtu.be/sPQ3ptUMltA

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 25 Marks
University Exam(UE): 75 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

Part A: Introduction				
Program: **Certificate Course**		Class: **B.C.A. I Year**	Year: **2022**	Session:**2022-2023**
1	Course Code	**BCA-2T**		
2	Course Title	**Computer Fundamental and MS Office**		
3	Course Type	**Theory**		
4	Pre-requisite (if any)	No		
5	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Describe the history and types of computers and various input/output devices. • Understand the concept of memory and its types. • Understand the MS Word with page setup, formatting text, print documents and mail merge • Understand the MS Excel with creating sheets, calculation in cell and prepare charts. • Understand the sorting & filter in MS Excel. • Understand the MS Power point with design templates, slide transaction and animation effects.		
6	**Credit Value**	**Theory: 4**		
7	**Total Marks**	**Max. Marks: 25+75**	**Min Passing Marks : 33**	

Part B: Content of the Course		
Total Periods: 60		
Unit	**Topics**	**No. of Periods**
I.	**Introduction**: History of computer, Generation of computer, Block diagram of CPU, Digital and Analogue computers and its evolution. Major components of digital computers, types of digital computers, Memory addressing capabilityof CPU. Word length and processing speed of computers, Microprocessors, Single chip Microcomputer, Large and small computers, Users interface, hardware, software and firmware, multiprogramming multiuser system, Dumb smart and intelligent terminals, Number systems & Computer Codes.	12
II.	**I/O Devices:** Keyboard, Mouse, Monitor, Impact and Non-Impact Printers, Plotters, Scanner, other Input/output devices: Scan method of Display, Raster Scan, Vector Scan, Bit Mapped Scan, CRT Controller, I/O Port, Programmable and Non Programmable I/O port, Inbuilt I/O ports, Parallel and Serial ports, USB, IEEE 1394, AGP, Serial data transfer scheme, Microcontroller, Signal Processor, I/O processor, Arithmetic Processor.	12
III.	**Memory:** Memory hierarchy, Primary and Secondary Memory, Cache memory, Virtual Memory, Direct Access storage devices (DASD) Destructive and Non-destructive Readout, Program and data memory, Memory Management Unit (MMU), PCMCIA cards and Slots.	12

IV.	**MS-Word:** Introduction to word processing software and it's features, Creating new document, Saving documents, Opening and Printing documents. Home Tab: Setting fonts, Paragraph settings, Various styles (Normal, No spacing, Heading1, Heading2, Title, Strong), Find &Replace, Format painter, Copy paste and paste special. Insert Tab: Pages, Tables, Pictures, Clipart, Shapes, Header & Footer, Word Art, Equation and Symbols. Page Layout Tab: Page setup, Page Background, Paragraph (indent and spacing). Mailing Tab: Create Envelops and Labels, Mail Merge. Review Tab: Spelling and Grammar check, New comment, Protect document, View Tab: Document views, Zoom, Window (New window, Split, Switch window).	10
V.	**Working with MS-Excel & PowerPoint** **MS-Excel:** Introducing Excel, Use of Excel sheet, creating new sheet, Saving, Opening, and Printing workbook. Home Tab: Font, Alignment, Number, Styles and cells and editing, Conditional Formatting. Insert Tab: Table, Charts (column chart, Pie chart, Bar chart, Line chart) and Texts (header & footer, word art, signature line). Page Layout Tab: Page setup options, Scale to fit (width, height, scale). Formulas Tab :Auto sum (sum, average, min, max), Logical (IF, and ,or ,not ,true, false), Math & Trig (sin, cos, tan, ceiling, floor, fact, mod, log), Sort and Filter options , Data validation, Group and ungroup. Review Tab: Protect sheet, Protect workbook, and Share workbook. View Tab: Page breaks, Page layout, Freezing Panes, Split and hide. **PowerPoint:** Introducing power point, Use of power point presentation, Creating new slides saving, Opening and printing. Home Tab: New slide, Layout, Reset, Delete, Setting text direction, Align text, Convert to smart art, Drawing options. Insert Tab: Table, Picture, Clipart, Photo album, Smart art, Shapes and chart, Movie and sound, Hyperlink and action, Text box , Word art, Object. Design Tab: Page setup options, Slide orientation, Applying various themes, Selecting background style and formatting it. Animations Tab: Custom animation for entrance, Exit and emphasis, Applying slide transition, Setting transition speed and sound, Animation on rehears timing. Slide show & View Tab: Start slide, Show options, and Setup options. View tab: Presentation views, Colors and Window option.	14
Keywords: Computer, Input /Output Devices, Memory, MS Word, MS Excel, MS Power Point, Memory, Operating System, Hardware, Software.		

Part C - Learning Resources
Text Books, Reference Books, Other Resources
Suggested Readings: **Text Books:** 1. Computer Fundamentals, P.K. Sinha, BPB Publication, Sixth Edition. 2. Computer Fundamentals Architecture and Organization, B. Ram, New Age International Publishers, Fifth Edition. 3. Fundamentals of Computers, V. Rajaraman, PHI, Sixth Edition. 4. Computers Today, Donald H. Sanders, McGraw-Hill, Third Edition.

5. IBM PC and Clones, B. Govindarajulu, McGraw-Hill, Second Edition. Text Books:
6. Computer science: an overview, Brookshear, J.G., Pearson Education
7. Fundamental of Computers, Raja Raman V., Prentice Hall of India, New Delhi.
8. OFFICE 2007 in Simple Steps, Kogent Solution Inc., DremTech Press
9. EXCEL 2007 in Simple Steps, Kogent Solution Inc., DremTech Press
10. POWERPOINT 2007 in Simple Steps, Kogent Solution Inc., DremTech Press

E Resources:

1. Introduction to Computer Fundamental:
   https://www.w3schools.blog/computer-fundamentals-tutorial
   https://vikaspedia.in/education/digital-litercy/it-literacy-courses-in-associating-with-msup/computer-fundamentals
   https://www.tutorialspoint.com/computer_fundamentals/index.htm
   https://vikaspedia.in/education/digital-litercy/it-literacy- courses-in-associating-with-msup/computer-fundamentals
   https://nptel.ac.in/courses/106/103/106103068/
2. Introduction to MS-Word:
   https://www.w3schools.blog/ms-word-tutorial
3. Introduction to MS-Excel:
   https://www.w3schools.com/excel/excel_introduction.php
4. Introduction to MS-Power Point:
   https://www.w3schools.blog/powerpoint-tutorial

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 25 Marks University Exam(UE): 75 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

Part A: Introduction				
Program: **Certificate Course**		Class: **B.C.A. I Year**	Year: **2022**	Session:2022-2023
1.	Course Code	**BCA-3T**		
2.	Course Title	**Programming with C and C++**		
3.	Course Type	**Theory**		
4.	Pre-requisite (if any)	**No**		
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Develop programming skill and learn how to implement a new software. • Develop programming and logical concepts which helps to build up source code of concern programming language. • Understand the concept of programming like Compilation, Debugging, Executing, Linking and Loading. • Familiar about the structure of C and C++ program. • Understand about the cursor movement and control structure of C and C++ program. • Write simple C and C++ programs using programming concepts. • Familiar about procedure oriented and object oriented concepts. • Understand the concept of inheritance and polymorphism which helps them to develop programs to solve real world problems. • Use file handling concepts in C and C++ to develop programs for real life projects. • Develop new applications with C and C++ which helps them to switch in Software Industry.		
6.	**Credit Value**	**Theory: 4**		
7.	**Total Marks**	**Max. Marks: 25+75**	**Min Passing Marks: 33**	

Part B: Content of the Course		
Total Periods: 60		
Unit	Topics	No. of Periods
I.	**Introduction and Programming Concepts :** Definition of Program, Source file, Object file, Executable file, Header file, Language Translator- Assembler, Interpreter, Compiler, Testing, Debugging, Linker and Loader, Algorithms, Flow Charts, History of C language, Structure of C program , C Tokens: Identifiers , Keywords, Constants, Variables, Operators , Data Types , Control structure : Conditional and looping statements, Operator Precedence and Associativity, Array and it's types.	12
II.	**Core Concepts of C Programming: Functions :** Standard Library and User defined functions, function prototype, Call by value and Call by reference, recursive functions, String functions, **Structure :** Declaration and Definition, Nested structure, array within structure. **Union:** Declaration and Definition, union variables, **Pointers:** Declaration and Definition, using & and * operators, pointer arithmetic, pointer to pointer, **Dynamic memory allocation functions:** malloc, calloc, realloc, free, **File Handling**: Basics, File Pointer, various file accessing functions.	12
III.	**Introduction to Object Oriented Programming:** Concepts, Features of C++, Bottom up Approach, Structure of C++ program, Data types, Class and Objects, Access Specifiers: Private, Public, Protected, I/O statements,	12

	Insertion and Extraction operator, Scope resolution operator, Array, this pointer, **Constructor :**, Default constructor, Copy constructor, Parameterized constructor , Destructor.	
IV.	**Inheritance:** Definition, Concept of base and derived class, Types of Inheritance: Single, Multilevel, Multiple, Hierarchical and Hybrid Inheritance. **Polymorphism:** Definition, Compile time polymorphism: Function overloading, Operator overloading, Run time polymorphism: Virtual Function, pure virtual function. Inline function, friend function, friend class.	12
V.	**Input-Output and File Handling :** I/O classes, File and Stream classes, Char I/O, String I/O, Object I/O, File Pointer, Opening and Closing file. **Exception Handling and Standard Template Library :** Definition, Exception basics, try, catch and throws keywords, Template, Components of STL.	12
Keywords: Token, datatype, Operators, Functions, Class, Inheritance, Polymorphism.		

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

1. Program Design, Peter Juliff, PHI Publications.
2. Let us C: Yashwant Kanetkar, BPB Publications.
3. Programming in ANSI C, E. Balaguruswamy, Tata McGraw Hill
4. Let us C++ ,Y. Kanetkar, B.P.B Publication.
5. Programming in C++, E. Balaguruswamy, Tata McGraw Hill.

E Resources:

- **C/C++ different topics from SWAYAM/NPTEL**

1. Introduction
   https://onlinecourses.nptel.ac.in/noc19_cs38/preview
   https://onlinecourses.nptel.ac.in/noc22_cs103/preview
   https://www.youtube.com/watch?v=KG4hjVDw-p8&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=2

2. Constant and Inline Function
   https://www.youtube.com/watch?v=pX6LufLso2M&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=10

3. Pointer and Reference
   https://www.youtube.com/watch?v=GtsBZ5e1-cE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=12

4. Function Overloading
   https://www.youtube.com/watch?v=uJGmGAShHeU&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=13

5. Operator Overloading
   https://www.youtube.com/watch?v=0jpOwe4d-FE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=17

6. Dynamic Memory Management
   https://www.youtube.com/watch?v=lkFK2X6qIc0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=18

7. Class and Object
   https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24

8. Access Specifiers
   https://www.youtube.com/watch?v=6ki_W7cXdM0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=22

9. Constructor and Destructor
   https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24

- **C different topics from W3School**
  https://www.w3schools.com/c/
- **C++ different topics from W3School**
  https://www.w3schools.com/CPP/default.asp
- **C different topics from Javatpoint**
  https://www.javatpoint.com/c-programming-language-tutorial
- **C++ different topics from Javatpoint**
  https://www.javatpoint.com/cpp-tutorial

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 25 Marks
University Exam(UE): 75 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

Part A: Introduction

Program: **Certificate Course**	Class: **B.C.A. I Year**	Year: **2022**	Session:2022-2023

1.	Course Code	**BCA-4T**
2.	Course Title	**Data Structure**
3.	Course Type	**Theory**
4.	Pre-requisite (if any)	No
5.	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Use different types of data structures, operations and algorithms. • Implement appropriate sorting/searching technique for any given problem. • Use stack, Queue, Lists, Trees and Graphs in problem solving. • Find suitable data structure during application development/ Problem Solving.
6.	**Credit Value**	**Theory: 6**
7.	**Total Marks**	**Max Marks: 25+75** / **Min Passing Marks: 33**

Part B: Content of the Course

Total Periods: 90

Unit	Topics	No. of Periods
I.	**Introduction and Basic Concepts of Data Structure:** Data types: primitive, non-primitive data types, ADT, Linear and nonlinear data structure. **Linear Data Structures**: Arrays: One dimensional, Multidimensional array, allocation methods, address calculations, sparse arrays. Linked List: Singly and Doubly Linear link lists, singly and doubly circular linked list: Definitions, operations (INSERT, DELETE, TRAVERSE) on these lists. (Insertion operation includes – insertion before a given element, insertion after a given element, insertion at given position, insertion in sorted linked list)	18
II.	**Stack:** Stack: Definition, Operations PUSH, POP, TRAVERSE, implementations using array and linked list, Applications of stack: Infix, Prefix, Postfix representation and conversion using stack, Postfix expression evaluation using stack. **Queue:** Introduction, and Types of Queues: Priority Queue, Circular queue, Double Ended Queue, operations (INSERT, DELETE, TRAVERSE), implementation using array and linked list and applications	18
III.	**Non-linear Data Structure:** **Trees:** Definition of trees and their types, Binary trees, Properties of Binary trees and Implementation operation (Insertion, deletion, searching and traversal algorithm: preorder, post order, in-order traversal), Binary Search Trees, Implementations, Threaded trees, AVL Trees.	18
IV.	Graph: Definition of Graph and their types, adjacency and incident (matrix & linked list) representation of graphs. Graph Traversal – Breadth first Traversal, Depth first Traversal, Connectivity of graphs; Weighted Graphs, Shortest path Algorithm, spanning tree, Minimum Spanning tree, Kruskal's and prim's algorithms. Static Hashing: Introduction, Hash table, Hash function.	18

V.	**Sorting Methods:** Types of sorting, Sequential Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort. **Searching**: Linear search, Binary search, Hashing, collision resolution methods, Comparison of Search trees.	12
Keywords: Linear Data Structure, Non-linear Data Structure, Searching, Sorting.		

Part C - Learning Resource
Text Books, Reference Books, Other Resources
Suggested Readings: 1. "Data Structures and Algorithms in C++", Michael T. Goodrich, Wiley, 2007 2. "Fundamentals of Data Structures", Horowitz and Sahani, Computer Science Press, 1978 3. "Data structures and Algorithms", Aefred V. Aho, Jhon E. Joperoft and J.E. Ullman. 4. "An Introduction to Data Structures with Applications", Jean Paul Trembley and Paul Sorenson, TMH, International Student Edition, 1985 5. "Data Structures and Program Design in C", R. Kurse, Leung &Tondo, 2nd Edition, PHI publication **E Resources:** • **Data Structure related topics from SWAYAM/NPTEL** 1. Introduction to Data Structure https://www.youtube.com/watch?v=zWg7U0OEAoE&list=PLBF3763AF2E1C572F&index=1 2. Stacks https://www.youtube.com/watch?v=g1USSZVWDsY&list=PLBF3763AF2E1C572F&index=2 3. Queues and linked list https://www.youtube.com/watch?v=PGWZUgzDMY1&list=PLBF3763AF2E1C572F&index=3 4. Trees https://www.youtube.com/watch?v=tORLeHHtazM&list=PLBF3763AF2E1C572F&index=6 5. Graphs https://www.youtube.com/watch?v=9zpSs845wf8&list=PLBF3763AF2E1C572F&index=24

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 25 Marks University Exam(UE): 75 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

Part A: Introduction

Program: **Certificate Course**	Class: **B.C.A. I Year**	Year: **2022**	Session:**2022-2023**

1	Course Code	**BCA-5T**
2	Course Title	**Digital Electronics**
3	Course Type	**Theory**
4	Pre-requisite (if any)	No
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: • Examine the structure of number systems and perform the conversion among different number systems • Illustrate reduction of logical expressions using Boolean algebra, k-map and tabulation method and implement the functions using logic gates • Realize combinational circuits for given application • Analysis synchronous and asynchronous sequential circuits using flip-flops • Define combinational logic circuits using programmable logic devices.
6	**Credit Value**	**Theory: 6**
7	**Total Marks**	**Max. Marks: 25+75** / **Min Passing Marks: 33**

Part B:Content of the Course

Total Periods: 90

Unit	Topics	No. of Periods
I	**Background of Digital Electronics:** Digital Signals, Semiconductors and Integrated Circuits: Introduction to semiconductors & its types, Diode, PNP & NPN transistors, CE amplifier & Switching characteristics of Transistors, Logic Families, Scale of Integration, RTL, DTL, TTL and its characteristics, Emitter Coupled Logic (ECL), CMOS Logic Family, NMOS and PMOS Logic, Comparison of Different Logic Families.	18
II	**Data Representation**: Decimal, Octal, Binary, Hexadecimal, Conversation from one number system to another number system, Binary Math: Binary Addition, Binary Subtraction, Binary Complements, One's & Two's Complement, Binary Subtraction using Two's Complement, Overflow and Underflow, Codes: ASCII code, EBCDIC codes, Grey codes, Excess-3, BCD codes, Error detection and Correcting codes.	18
III	**Logic Gates Basics:** AND Gate, OR Gate, NOT Gate, NOR Gate, NAND Gate, Exclusive-OR (XOR) Gate, Exclusive-NOR (XNOR) Gate, Truth Tables for Logic Gates, Truth Tables for Combinational Logic.	18
IV	**Boolean Algebra and Karnaugh Maps:** Boolean algebra, Basic Boolean Law, Demerger's theorem, Map Simplification minimizing technique, Sum of products, Product of sums, Converting SOP & POS to Truth Table & Truth	18

	Table to Expression, K Map, Minimization techniques of Boolean Expression using K-Maps, "Don't Care" Conditions, Minimization of Multiple Output Boolean Functions, VEM Theory of K-Map, MEV and Minimization of Two, Three, Four, Five and Six Variable Maps using VEM.	
V	**Combinational and Sequential Circuit:** Introduction to Combinational and Sequential Circuit, Adders: Half adder & Full adder, Subtractor, Seven-Segment Displays Circuits, Encoder, Decoders, Multiplexers, De-multiplexers, Flip-Flop, D Latch, RS Flip Flop, J-K Flip-Flop, Registers, Counter: Ripple (Asynchronous) Counter and Synchronous Counter, UP/DOWN Counters.	12

Keywords: Number System, Logic Gates, Boolean, K-map, Flip Flop, Combinational and Sequential Circuit, VEM, Truth table.

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

TEXT/REFERENCE BOOKS:

1. Modern Digital Electronics, R.P. Jain, TMH
2. Digital Principles & Application, Leach & Malvino, TMH
3. Digital Logic Design, Morries Mano, PHI
4. Digital design- Principles and Practices, J. F. Wakerly, Pearson India.
5. Digital Integrated Electronics, H.Taub & D. Shilling, McGraw Hill.
6. Digital Principles & Design, Givone, TMH
7. Digital Circuit & Design, S. Aligahanan, S. Aribazhagan, Bikas Publishing House.
8. Fundamentals of Digital Electronics & Microprocessor, Anokh Singh, A.K. Chhabra, S.Chand
9. Digital Circuits and Logic Design, Samuel Lee, PHI publication

E-RESOURCES:

1. SWAYAM URL Link for Digital Electronics: https://onlinecourses.nptel.ac.in/noc20_ee32/preview
2. SWAYAM URL Link for Digital Electronics: https://onlinecourses.nptel.ac.in/noc19_ee51/preview

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 25 Marks
University Exam(UE): 75 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	25 Marks

Part A: Introduction				
Program: **Certificate Course**		Class: **B.C.A. I Year**	Year: **2022**	Session:**2022-2023**
1	Course Code	**BCA-1P**		
2	Course Title	**LAB1: PC Software**		
3	Course Type	**Practical**		
4	Pre-requisite (if any)	No		
5	Course Learning. Outcomes (CLO)	At the end of course, Students will be able to: • Learn Modern office activities and their software requirements. • Create a new Word document and formatting a document using MS-WORD. • Create an electronic spreadsheet using MS-Excel, familiarize oneself with Excel's basicand advance features. • Create a slide show presentation and explore the Microsoft Office PowerPointenvironment.		
6	**Credit Value**	**Practical: 2**		
7	**Total Marks**	**Max. Marks: 100**		**Min Passing Marks: 33**

Part B: Content of the Course	
Total Periods: 30	
Tentative Practical List	**Note:** This is tentative list; the teachers concern can add more program as per requirement. **MS Word** 1. Prepare **a grocery list** having four columns (Serial number, the name of the product,quantity and price) for the month of April, 06. • Font specifications for Title (Grocery List): 14-point Arial font in bold and italics. • The headings of the columns should be in 12-point and bold. • The rest of the document should be in 10-point Times New Roman. • Leave a gap of 12-points after the title. 2. Create a **telephone directory**. • The heading should be 16-point Arial Font in bold. • The rest of the document should use 10-point font size. • Other headings should use 10-point Courier New Font. • The footer should show the page number as well as the date last updated. 3. Design a **time-table form** for your college. • The first line should mention the name of the college in 16-point Arial Fontand should be bold. • The second line should give the course name/teacher's name and the departmentin 14-point Arial. • Leave a gap of 12-points. • The rest of the document should use 10-point Times New Roman font. • The footer should contain your specifications as the designer and date of creation. 4. XYZ Publications plans to release a new book designed as per your syllabus. Design the **First page of the book** as per the given specifications. • The title of the book should appear in bold using 20-point Arial font. • The name of the author and his qualifications should be in the center of the page in 16-point Arial font. • At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.

- The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.
   - Compose a note inviting friends to a get-together at your house, including a listof things to bring with them.
   - Design a certificate in landscape orientation with a border around the document.
   - Design a Garage Sale sign.
   - Make a sign outlining your rules for your bedroom at home, using a numberedlist.
6. Create the following documents:
   - A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
   - Use a newsletter format to promote upcoming projects or events in your classroom or college.
7. Convert following text to a table, using comma as delimiterType the following as shown (do not bold).

Color, Style, Item
Blue, A980, Van
Red, X023, Car
Green, YL724, Truck
Name, Age, Sex
Bob, 23, M
Linda, 46, F
Tom, 29, M

8. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column **Region** (values: S, N, N, S, S, S) between the **Salesperson** and **Dolls** columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:
In this exercise, you will add a new row to your table, place the word **Total** at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

9. Wrapping of text around the image.

MS Excel

1. Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION						
State	Qtr1	Qtr2	Qtr3	Qtr4	Qtr Total	Rate Amount
Delhi	2020	2400	2100	3000	15	
Punjab	1100	1300	1500	1400	20	
U.P.	3000	3200	2600	2800	17	

Haryana	1800	2000	2200	2700	15	
Rajasthan	2100	2000	1800	2200	20	
TOTAL						
AVERAGE						

(a) Apply Formatting as follow:

i. Title in TIMES NEW ROMAN
ii. Font Size - 14
iii. Remaining text - ARIAL, Font Size -10
iv. State names and Qtr. Heading Bold, Italic with Gray Fill Color.
v. Numbers in two decimal places.
vi. Qtr. Heading in center Alignment.
vii. Apply Border to whole data.

(b) Calculate State and Qtr. Total
(c) Calculate Average for each quarter
(d) Calculate Amount = Rate * Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	HarBhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>=80	A+
>= 60 and < 80	A
>= 50 and < 60	B
< 50	F

3. Given the following worksheet

	A	B	C	D	E	F	G
1	**Salesman**	**Sales in (Rs.)**					
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	**Then Commission**
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
>= 35000	11% of sales

The total sales are sum of sales of all the four quarters.

4. Company XYZ Ltd. pays a monthly salary to its employees who consist of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

- **HRA Dependent on Basic**

30% of Basic if Basic <=1000
25% of Basic if Basic>1000 & Basic<=3000
20% of Basic if Basic >3000

- **DA Fixed for all employees, 30% of Basic**
- **Conveyance Allowance (CA)**
  Rs. 50/- if Basic is <=1000
  Rs. 75/- if Basic >1000 & Basic<=2000
  Rs. 100 if Basic >2000
- **Entertainment Allowance (EA)**
  NIL if Basic is <=1000
  Rs. 100/- if Basic > 1000

Deductions

- **Provident Fund**
  6% of Basic
- **Group Insurance Premium**
  Rs. 40/- if Basic is <=1500
  Rs. 60/- if Basic > 1500 & Basic<=3000
  Rs. 80/- if Basic >3000

Calculate the following:

Gross Salary= Basic + HRA + DA + CA + EA
Total Deduction = Provident Fund + Group Insurance Premium
Net Salary= Gross Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time inthe format below:

No. of Installments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given therate of Interest and time

Rate of Interest	8%
Time	5 Years
Principal	Simple Interest
1000`	?
18000	?
5200	?

7. The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2019	2020	2021	2022
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

(a) Calculate total sale year wise.
(b) Calculate the net sale made by each salesman
(c) Calculate the maximum sale made by the salesman
(d) Calculate the commission for each salesman under the condition.
(i) If total sales >4,00,000 give 5% commission on total sale made by the

salesman.

(ii) Otherwise give 2% commission.

(e) Draw a bar graph representing the sale made by each salesman.

(f) Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES	JAN	FEB	MARCH QUARTER TOTAL	QUARTER AVERAGE
Rent	600.00	600.00	600.00	
Telephone	48.25	43.50	60.00	
Utilities	67.27	110.00	70.00	
Credit Card	200.00	110.00	70.00	
Oil	100.00	150.00	90.00	
AV to Insurance	150.00			
Cable TV	40.75	40.75	40.75	
Monthly Total				

Calculate Quarter total and Quarter average.

(a) Calculate Monthly total.

(b) Surplus = Monthly income - Monthly total.

(c) What would be total surplus if monthly income is 1500.

(d) How much does telephone expense for March differ from quarter average.

(e) Create a 3D column graph for telephone and utilities.

(f) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher Name	1997	1998	1999	2000	Total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs 1,100.00.	

(a) Compute the total revenue earned.

(b) Plot the line chart to compare the revenue of all publishers for 4 years.

(c) Chart Title should be _Total Revenue of Sam's Bookstall (1997-2000)'

(d) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. Howmany no. are in range 50-60.

MS Power Point

1. Do the following task:

i. Start a new blank presentation

ii. Your first Slide is going to be a Title Slide

iii. Write the Text as in the preview below:
Lighthouse Co Ltd

iv. Make the Font of "Lighthouse" Arial Black and size 88

v. Insert a second slide this should be with a layout of Bulleted List

vi. Write the Text as in preview below

(a) [Title]: Lighthouse Co Ltd
(b) [Body]:
  i. Mission Statement
  ii. Company Objectives
  iii. Management Team
  iv. Employees
  v. Sales

vii. Make the Font Colour of the Points to Green

viii. Insert a third slide this should be an Organization Chart.
Include the following people in the chart:
  a. David Brent, General Manager
  b. Tim Canterbury, Head of Sales
  c. Gareth Keenan, Assistant to the General Manager
  d. Dawn Tinsley , Human Resources Manager

ix. Add a fourth slide this should be a Table Chart.
The chart should look like the following:

New Products	Discontinued Products
Digital Cameras	8mm Cameras
Ultra Slim Video Camera	8x Zoom Video Camera
25" Plasma TVs 21"	Black and White TVs
DVD Recorders	Video Players
7.1 Dolby Surround Systems	2 channel stereo systems

x. Make the titles New Products and Discontinued Products with a shadow effect and centred in the cell. Widen columns to fit Text as above.

xi. The Fifth slide should be a Chart slide. The chart should be a bar chart, and include the following data must be used to form the chart:

	January	February	March	April
TVs	20	27	90	75
DVDs	30	38	34	31
Wifi equipment	45	46	45	43
Video Recorders	25	29	15	40

xii. Change the colours of the chart so that the series of bars are red, yellow, pink, and green.

xiii. Add a light coloured background to all slides in the presentation.

xiv. Add also Transition effects between each slides and also different effects for all text and pictures it the presentation.

xv. Reverse the order of the second and third slides

xvi. Save the presentation as Light House Ltd.

2. Do the following:

i. Load your Presentation Application and start a new presentation

ii. The first slide is a Title Slide. Select the appropriate layout and enter the title: **Annual Food Fair**

iii. Add the sub title: **.A Celebration of Eating**

iv. Insert a small, red circle at the bottom right of the title slide.

v. Change the font colour for the whole title and sub title to blue, and apply a text shadow effect just to the words **Food** and **Fair**

vi. Insert a second slide to the presentation, selecting a layout appropriate for a series of bullet points, and using the title: **The Menu**. Enter the following text:
  i. Chocolate Desserts
  ii. Cakes and Puddings
  iii. Roast Meals
  iv. Using Pasta Creatively

vii. Change the line spacing for these bullet points to 1.5 lines.
viii. Increase the font size for the words **The Menu** in the title.
ix. Add a footer with your name and the text: **Food Fair** so they both appear on every slide, and number all the slides. (Make sure the number is not obscured by the red circle on the title slide)
x. Insert a third slide, which is to be an organisation chart. Use the title **Meet The Team**. Enter: **Maggie Peet, Manager** at the top of the chart, and show the following three as reporting to Maggie Peet: **Brian Webb, Bookings; Janine Newton, Publicity; Gregg Brown, Accounts**
xi. Embolden the text in the title of the third slide, and change the font to Arial.
xii. Apply a light coloured background to all the slides in the presentation
xiii. On the third slide, insert an image suitable for the topic of food from an image library. Reduce the size of the image and place it where it will not interfere with text.
xiv. Save the presentation as **foodfair**.
xv. Print the presentation with three slides per page, and close the presentation.

3. Do the followings:
i. Load your Presentation Application and start a new presentation
ii. The first slide is a Title Only Slide. Select the appropriate layout and enter the title: **Cook Family Cruises.**
iii. Add a small blue rectangle at the top left of this slide.
iv. Change the font colour for the whole title to red, and apply a text shadow effect just to the word **Cruises.**
v. Insert a second slide to the presentation, selecting a layout appropriate for a series of bullet points, and using the title: **Our Itinerary**. Enter the following text:
    a. Canary Islands
    b. Mediterranean
    c. Greek Islands
vi. Change the line spacing for these bullet points to 2 lines. Increase the font size of the word **Itinerary** in the title. Add a footer with your name and the text: **Cruise Information** so they both appear on every slide, and number all the slides.
vii. Insert a third slide, which is to be a graph. Use the title **Our Market Share.** Use the following data to produce a pie chart: Cook 54%; Jackson 28%; Wilson 12%; Bennett 5%
viii. Embolden the text in the title of the third slide, and change the font to Arial.
ix. Apply a different background to each slide in the presentation.
x. On the third slide, insert an image suitable for the topic of holidays from an image library. Reduce the size of the image and place it where it will not interfere with text.
xi. Add a 4^{th} slide containing nothing but the text: **Travel with us for less!!**
xii. Save the presentation as holidays.
xiii. Print the presentation with 4 slides per page, and close the presentation.
4. Create an animation looks like the leaf is falling in a tree.
5. Create an animation looks like demolish a world trade center in America.

Keywords: MS Word, MS Excel, MS Power Point.

Part C - Learning Resource
Text Books, Reference Books, Other Resources
Suggested Readings: **Text Books:** 1. OFFICE 2007 in Simple Steps, Kogent Solution Inc., DremTech Press 2. EXCEL 2007 in Simple Steps, Kogent Solution Inc., DremTech Press 3. POWERPOINT 2007 in Simple Steps, Kogent Solution Inc., DremTech Press

Part D: **Assessment and Evaluation**		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): Not Applicable University Exam(UE): 100 Marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	Not Applicable

Part A: Introduction				
Program: **Certificate Course**		Class: **B.C.A. II Year**	Year: **2022**	Session: **2022-2023**
1	Course Code	**BCA-2P**		
2	Course Title	**LAB 2: Programming with C and C++**		
3	Course Type	**Practical**		
4	Pre-requisite (if any)	Theoretical knowledge of C and C++		
5	Course Learning Outcomes (CLO)	At the end of course, Students will be able to: • Understand the fundamental programming concepts and methodologies which are essential to create good C/C++ programs. • Code, test, and implement a well-structured, robust computer program using the C/C++ programming language. • Write reusable modules (collections of functions). • Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing. • Develop an in-depth understanding of functional, logic, and object-oriented programming paradigms.		
6	**Credit Value**	**Practical: 2**		
7	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 33**	

Part B: Content of the Course	
Total Periods: 30	
Tentative Practical List	**Note:** This is tentative list; the teachers concern can add more program as per requirement. 1. Write a program in C/C++ for addition of two numbers using float data type. 2. Write a program in C/C++ to find the biggest number between two numbers. 3. Write a program in C/C++ to find the factorial value of any entered number using do – while loop. 4. Write a program in C/C++ for various arithmetic operations using switch case statements. 5. Write a program in C/C++ for Multiplication of two 3X3 matrix. 6. Write a program in C/C++ to store five books information using structure. 7. Write a program in C/C++ to store six employee information using union. 8. Write a program in C/C++ to calculate simple interest using call by value and call by reference method. 9. Write a program in C/C++ for swapping of two numbers using pointer. 10. Write a program in C/C++ to make a text file using file handling. 11. Write a program to count word, space and lines in a text file. 12. Write a program to demonstrate work of calloc().

Part A: Introduction				
Program: **Certificate Course**		Class: **B.C.A. II Year**	Year: **2022**	Session: **2022-2023**
1	Course Code	**BCA-2P**		
2	Course Title	**LAB 2 : Programming in C and C++**		
3	Course Type	**Practical**		
4	Pre-requisite (if any)	Theoretical knowledge of C and C++		
5	Course Learning Outcomes (CLO)	At the end of course, Students will be able to: • Understand the fundamental programming concepts and methodologies which are essential to create good C/C++ programs. • Code, test, and implement a well-structured, robust computer program using the C/C++ programming language. • Write reusable modules (collections of functions). • Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing. • Develop an in-depth understanding of functional, logic, and object-oriented programming paradigms.		
6	**Credit Value**	**Practical: 2**		
7	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks : 33**	

Part B: Content of the Course	
Total Periods: 30	
Tentative Practical List	**Note:** This is tentative list; the teachers concern can add more program as per requirement. 1. Write a program in C/C++ for addition of two numbers using float data type. 2. Write a program in C/C++ to find the biggest number between two numbers. 3. Write a program in C/C++ to find the factorial value of any entered number using do – while loop. 4. Write a program in C/C++ for various arithmetic operations using switch case statements. 5. Write a program in C/C++ for Multiplication of two 3X3 matrix. 6. Write a program in C/C++ to store five books information using structure. 7. Write a program in C/C++ to store six employee information using union. 8. Write a program in C/C++ to calculate simple interest using call by value and call by reference method. 9. Write a program in C/C++ for swapping of two numbers using pointer. 10. Write a program in C/C++ to make a text file using file handling. 11. Write a program to count word, space and lines in a text file. 12. Write a program to demonstrate work of calloc().

13. Write a program to demonstrate work of malloc(), realloc() and free().
14. Write a program in C++ to find the sum and average of five numbers using class and objects.
15. Write a program in C++ to multiply two numbers using private and public member functions.
16. Write a program in C++ to print structure like this using scope resolution operator

    1
    1 2
    1 2 3
    1 2 3 4
    1 2 3 4 5
17. Write a program in C++ for constructor and Destructor.
18. Write a program in C++ for multiple inheritance.
19. Write a program in C++ for operator overloading.
20. Write a program in C++ for friend class and friend function.
21. Write a program in C++ for virtual function and virtual class.
22. Write a program in C++ for Exception Handling.
23. Write a program in C++ to open and close a file using file Handling.
24. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
25. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
26. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration
27. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
28. Create Matrix class using templates. Write a menu-driven program to perform following Matrix Operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose 22. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).
29. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
30. Create a class Box containing length, breath and height. Include following methods in it: a) Calculate surface Area b) Calculate Volume c) Increment, Overload ++ operator (both prefix & postfix) d) Decrement, Overload -- operator (both prefix & postfix) e) Overload operator == (to check equality of two boxes), as a friend function f) Overload Assignment operator g) Check if it is a Cube or cuboid Write a program which takes input from the user for length, breath and height to test the above class.
31. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
32. Write a program to retrieve the student information from file created in previous

	question and print it in following format: Roll No. Name Marks 33. Copy the contents of one text file to another file, after removing all whitespaces. 34. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void. 35. Write a program for exception handling.

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

1. Program Design, Peter Juliff, PHI Publications.
2. Let us C: Yashwant Kanetkar, BPB Publications.
3. Programming in ANSI C, E. Balaguruswamy, Tata McGraw Hill
4. Let us C++ ,Y. Kanetkar, B.P.B Publication.
5. Programming in C++, E. Balaguruswamy, Tata McGraw Hill.

E Resources:

C/C++ different topics from SWAYAM/NPTEL

1. Introduction
   https://onlinecourses.nptel.ac.in/noc19_cs38/preview
   https://onlinecourses.nptel.ac.in/noc22_cs103/preview
   https://www.youtube.com/watch?v=KG4hjVDw-p8&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=2

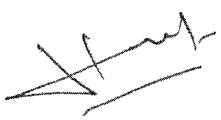
2. Constant and Inline Function
   https://www.youtube.com/watch?v=pX6LufLso2M&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=10

3. Pointer and Reference
   https://www.youtube.com/watch?v=GtsBZ5e1-cE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=12

4. Function Overloading
   https://www.youtube.com/watch?v=uJGmGAShHeU&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=13

5. Operator Overloading
   https://www.youtube.com/watch?v=0jpOwe4d-FE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=17

6. Dynamic Memory Management
   https://www.youtube.com/watch?v=lkFK2X6qIc0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=18



B4KrM9uOEdvPIVFUkU3jNc6D2&index=18

7. Class and Object
https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24

8. Access Specifiers
https://www.youtube.com/watch?v=6ki_W7cXdM0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=22

9. Constructor and Destructor
https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24

- C different topics from W3School
https://www.w3schools.com/c/
- C++ different topics from W3School
https://www.w3schools.com/CPP/default.asp
- C different topics from Javatpoint
https://www.javatpoint.com/c-programming-language-tutorial
- C++ different topics from Javatpoint
https://www.javatpoint.com/cpp-tutorial

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): Not Applicable
University Exam(UE): 100 Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test/Assignment/Presentation	Not Applicable