

Govt. Digvijay Autonomous PG College Rajnandgaon (C.G.)



SCHEME OF EXAMINATION & SYLLABUS

**FOR
THE FOUR-YEAR UNDER GRADUATE PROGRAMME
(FYUGP)**

**BACHELOR OF COMPUTER APPLICATION
(BCA- 1ST & 2ND) SEMESTER EXAM**

**UNDER
DEPARTMENT OF COMPUTER APPLICATION
SESSION – 2025-26**




(APPROVED BY BOARD OF STUDIES)

**Govt. Digvijay Autonomous PG College ,
Rajnandgaon(CG)**

Department of Computer Application

Session – 2025 -26

List of Members of Board of Studies(BOS)

S.No	Name of Member	Nominee Type	Signature
1	Mrs. Hempushpa	Chairman	
2	Dr. Durga Prasad Rao	VC Nominee	
3	Prof. Gulame Mustafa Ansari	Principal Nominee	
4	Prof. Shailendra Arya	Principal Nominee	
5	Mr. Anshu Ramteke	Adviser Member	
6	Ms. Nadini sahu	Ex-Student	

SYLLABUS AND MARKING SCHEME

BCA- IST Semester

S. No	Course Type	Course-code	Subject	Credit	Theory Marks	Internal Marks	Total Marks	
							Max	Min
1	DSC	CASC - 01	Discrete Mathematics	4	70	30	100	40
2		CASC - 02T	Computer Fundamental MS Office	3	70	30	100	40
		CASC - 02 P	Lab 1 : MS Office	1	35	15	50	20
3		CASC - 03 T	Operating System	3	70	30	100	40
4		CASC - 03 P	Lab 2 : Operating System	1	35	15	50	20
5	GE	CAGE - 01	Choose one from pool of GE	4	70	30	100	40
6	VAC	CAVAC-01	Choose one from pool of VAC	2	35	15	50	20
7	AEC	AEC	English Language	2	35	15	50	20
TOTAL				20	-	-	600	-

BCA- IIND Semester

S. No	Course Type	Course-code	Subject	Credit	Theory Marks	Internal Marks	Total Marks	
							Max	Min
1	DSC (Major/ Core)	CASC - 04	Digital Electronic	4	70	30	100	40
2		CASC - 05T	Programming in C++	3	70	30	100	40
		CASC - 05 P	Lab 3 : Programming in C++	1	35	15	50	20
3		CASC - 06 T	Data structure	3	70	30	100	40
4		CASC - 06 P	Lab 4: Data structure	1	35	15	50	20
5	GE	CAGE - 02	Choose one from pool of GE	4	70	30	100	40
6	SEC	CASEC -01	Choose one from pool of SEC	2	35	15	50	20
7	AEC		Hindi Language	2	35	15	50	20
TOTAL				20	-	-	600	-

DSC- Discipline Specific Course,
 DSE- Discipline Specific Elective
 AEC-Ability Enhancement Core Course,
 SEC- Skill Enhancement Course,
 GE- Generic Elective,
 VAC- Value Added course

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester -II	Session: 2024-2025 , 25-26
1	Course Code	CASC-04	
2	Course Title	Digital Electronics	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able:</p> <ul style="list-style-type: none"> To understand the fundamental concepts and techniques used in digital electronics. Understand how the computer system identifies the data inside. To understand and examine the structure of various number systems and its application in digital design. To Perform basic arithmetic calculations in binary, decimal and hexadecimal. The ability to understand, analyze and design various combinational and sequential circuits. To identify the basic requirements according to the specification for a newly customized digital circuit and design it in a cost effective manner. 	
6	Credit Value	4 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: Content of the Course

Total No. of Teaching-learning Periods (01 Hr. per period) – 60 Periods (60 Hours)

Unit	Topics (Course contents)	No. of Period
I	NUMBER SYSTEM AND DATA REPRESENTATION : Introduction of number system (binary, decimal, octal, hexadecimal etc.), inter-conversion between the number systems, arithmetic operations, complements in the number system, representation of numeric data(binary representation of integers, fixed point and floating point data representation).codes and its classification(weighted code and its types like NBCD etc. , non-weighted code like (Excess-3 code Gray code etc.) , alphanumeric code like (ASCII, UNICODE, EBCDIC etc.). Error detecting code like (parity bit coding technique, etc.).Error correcting codes like (hamming code etc.))	15
II	BOOLEAN ALGEBRA: Boolean algebra and basic operations, sum of product, product of sum, simplification of Boolean expression using simplification techniques: Boolean laws and K-Map. FUNDAMENTALS OF DIGITAL CIRCUIT DESIGN: Digital logic families and its properties, Logic gate and its types, Construction of basic digital circuits using fundamental gates as well as Universal gates, simplification of digital circuit. Types of digital circuits (combinational circuit, sequential circuits).	15
III	COMBINATIONAL CIRCUIT: Adder (half adder, full adder, N bit adder), Subtractor (half subtractor, full subtractor, N bit subtractor), Decoder, Encoder. Multiplexer, De-multiplexer. Comparator, Code Converter SEQUENTIAL CIRCUIT: Multivibrators/Latch, Flip- flop and its types (S R flip flop, D Flip Flop, J K Flip Flop, T Flip Flop, Master Slave Flip Flop), Register and its types, Counters and its types.	15
IV	MICROPROCESSORS: Introduction of microprocessor, evolution of microprocessor, basic components in microprocessor, basic microprocessor instruction, addressing modes, designing of eight-bit microprocessor (8085 microprocessor), designing of 16-bit microprocessor (8086 microprocessor).	15

designing of eight-bit microprocessor (8085 microprocessor), designing of 16-bit
microprocessor (8086 microprocessor).

Dr. H.S.Hota ^{Krishna} Chairman (Dr. B.B.Dubey) ^{Gopal} (Dr. S.K. Singh) ^{Raj} (Dr. S.Jain) ^{Ash} R. Khurana ^{Anita} Anita ^{Sushil Kumar} Sushil Kumar ^{T.C.} T.C.

(Amar)

Name and Signature of Convener & Members of CBoS:

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(Dr. K. B. Dahay)

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Dr. V. K. Singh

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By _____
attest my hand and seal this 17th day of July, 1971.

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Text Books, Reference Books and Others

- D. Nasib, S. Gill, J.B. Dixit, Digital Design and Computer Organization. Laxmi Publications Pvt Limited.
- K K Neniwal, Digital Electronics (Hindi). Paperback Publication.

- M. Morris Mano, Digital logic and Computer Design, Prentice-hall of India private ltd.
- A. K. Maini, Digital Electronics Principles, Devices and Applications, John Wiley & Sons, Ltd

- Digital Circuits by Prof. Santanu Chattopadhyay (NPTEL)
<https://youtube.com/playlist?list=PLbRMhDVUMngePP5JcezxImF-FzOC9wstz&si=6YjQgG1tFGtYmEZv>
- Digital Electronics by Prof Gautam Saha (NPTEL)
<https://youtube.com/playlist?list=PLbRMhDVUMnge4gDT0vBWjCb3Lz0HnYKkX&si=L6PMoGGOGI3MM5jv>
- Switching Circuits and Logic Design by Prof. Indranil Sengupta, IIT Kharagpur
https://youtube.com/playlist?list=PLbRMhDVUMngfV8C6EINAUaQQz06wEhFM5&si=e8goltfyf_VYBAzp0
- Online Simulator's for Digital Electronics Practices: [CircuitVerse - Digital Circuit Simulator online](#)
- Digital Electronics reference: [Digital Electronics Tutorial - Javatpoint](#)

Suggested Continuous Evaluation Methods:

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): **70 Marks**

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 = 20 Marks Section B: Descriptive answer type qts..out of 2 from each unit-4x10 = 40 Marks	

Name and Signature of Convener & Members of CBoS:

• H.S. Floberg
Chemist

CDr. K. A. Dubey

(John
(Do SK Salin)

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James CD

Qhal
(Dr. S. Jain)

R. K. Khawley

Sushil Kumar Bhatia

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

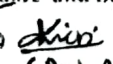
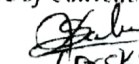
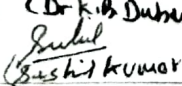
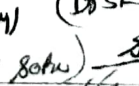
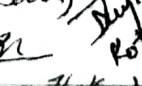
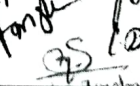
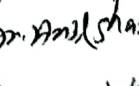

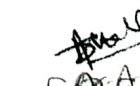
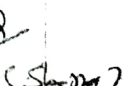


Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester - II	Session: 2024-2025, 25-26
1	Course Code	CASC-05T	
2	Course Title	Programming in C++	
3	Course Type	DSC (Discipline Specific Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the fundamentals of object oriented programming. • Write programs related to concept of object oriented program • Define functions, class and to create own Libraries. • Write programs for file handling. • Develop small programs to solve real world problems. 	
6	Credit Value	3 Credits	Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

PART -B: Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
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 its types, Pointer, Functions : Standard Library and User defined functions, function prototype, Call by value and Call by reference, recursive functions, String functions.	12
II	Introduction to Object Oriented Programming: Concept of object oriented programming, Features of C++, Structure of C++ program, Data types, structure, class and objects, Access Specifiers: Private, Public, Protected, inline functions, static data and static functions. Constructor: Default constructor, Copy constructor, Parameterized constructor, Destructor.	11
III	Inheritance and Polymorphism: 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, constructor overloading, Runtime polymorphism: Virtual Function, pure virtual function. Inline function, friend function, friend class.	11
IV	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.	11
Keywords	Token, Identifier, Keyword, Array, Function, Class, Object, Polymorphism, Inheritance, Constructor, Template.	

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hora 
 chairman (Dr. K.B. Dubey) 
 (Sushil Kumar Sahu) 
 (Dr. S.K. Sahu) 
 (Suman Thakur) 
 (Dr. Anil Sharma) 
 (Dr. S. Jain) 
 (K. K. Shrivastava) 
 (Dr. A.S. Sharma) 
 ANJEETA KUMAR 
 (Ankur) 
 (T. K. Kulkarni) 

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Juliff, Program Design, PHI Publications.
- Yashwant Kanetkar, Let us C: BPB Publications.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill

Reference Books Recommended:

- Y. Kanetkar, Let us C++, B.P.B Publication.
- E. Balaguruswamy, Programming in C++, Tata McGraw Hill.
- R. Kumar, Object Oriented Programming with C++, Prakhar Publication(Hindi)
- Dhupiya, Lakhyani, C++ Programming Alfa Publications, Ajmer (Paperback, Dhupiya, Lakhyani)(Hindi)

Online Resources:

- Introduction to C and C++ from SWAYAM/NPTEL
https://onlinecourses.nptel.ac.in/noc22_cs103/preview
<https://www.youtube.com/watch?v=KG4hjVDw-p8&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=2>
- Constant and Inline Function through NPTEL:
<https://www.youtube.com/watch?v=pX6LufLso2M&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=10>
- Pointer and Reference NPTEL
<https://www.youtube.com/watch?v=GtsBZSe1-cE&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=12>
- Function Overloading NPTEL
<https://www.youtube.com/watch?v=uJGmGAShHeU&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=13>
- Operator Overloading NPTEL
<https://www.youtube.com/watch?v=0jpOwc4d-FE&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=17>
- Dynamic Memory Management NPTEL
<https://www.youtube.com/watch?v=IkFK2X6qlc0&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=18>
- Class and Object NPTEL
https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=24
- Access Specifiers NPTEL
https://www.youtube.com/watch?v=6ki_W7cXdM0&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=22
- Constructor and Destructor NPTEL
https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUKU3jNc6D2&index=24
- C++ different topics from W3School
<https://www.w3schools.com/Cpp/default.asp>
- C++ different topics from Javatpoint
<https://www.javatpoint.com/cpp-tutorial>

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Suggested Continuous Evaluation Methods:

100 Marks

30 Marks

70 Marks

Name and Signature of Convener & Members of CBoS:

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in (Computer Application)
 (Certificate / Diploma / Degree)

Semester - II

Session: 2024-2025,
 25-26

1	Course Code	CASC-05P
2	Course Title	Lab 3: Programming in C++
3	Course Type	Practical
4	Prerequisite	As per program
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> Understand the fundamental programming concepts and methodologies which are essential to create good C++ programs Code, test, and implement a well-structured, robust computer program using the 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	1 Credits Credit =30 Hours Laboratory or Field Learning/Training
7	Total Marks	Max. Marks: 50 Min Passing Marks: 20

PART -B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
List of Practical Experiments. 1. Write a program in C++ for addition of two numbers using float data type. 2. Write a program in C++ to find the biggest number between two numbers. 3. Write a program in C++ to find the factorial value of any entered number using do – while loop. 4. Write a program in C++ for various arithmetic operations using switch case statements. 5. Write a program in C++ for Multiplication of two 3X3 matrices. 6. Write a program in C++ to store five books of information using structure. 7. Write a program in C++ to store six employee information using union. 8. Write a program in C++ to calculate simple interest using call by value and call by reference method. 9. Write a program in C++ to find the sum and average of five numbers using class and objects. 10. Write a program in C++ to multiply two numbers using private and public member functions. 11. 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 12. Write a program in C++ for constructor and Destructor.		30





13. Write a program in C++ for multiple inheritance.
14. Write a program in C++ for operator overloading.
15. Write a program in C++ for friend class and friend function.
16. Write a program in C++ for virtual function and virtual class.
17. Write a program in C++ for Exception Handling
18. Write a program in C++ to open and close a file using file Handling.
19. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
20. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
21. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration
22. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
23. Create a 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).
24. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
25. Create a class Box containing length, breadth 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
26. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
27. Write a program to retrieve the student information from the file created in the previous question and print it in the following format: Roll No. Name Marks
28. Copy the contents of one text file to another file, after removing all whitespaces.
29. Write a program for exception handling.
30. Write a program to insert data into file and to display it.

Note: Concerned teacher can add additional experiment as per requirement.

Keywords

Array, Function, Structure, union, matrix, constructor, destructor, inheritance.

Name and Signature of Convener & Members of BOS:

Dr. H.S. Hota, Chairman (Dr. B. Dubey, Dr. S.K. Sahu, Dr. Anil Sharma, R. Khuntia, Dr. A. Ananta Kumar)

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Juliff, Program Design, PHI Publications.
- Yashwant Kanetkar, Let us C: BPB Publications.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill

Reference Books Recommended:

- Y. Kanetkar, Let us C++, B.P.B Publication.
- E. Balaguruswamy, Programming in C++, Tata McGraw Hill.

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- ### Online Resources:

- ## PART -D: Assessment and Evaluation

Maximum Marks: 50 Marks

(Continuous Internal Assessment (CIA): 15 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): **35 Marks**

Name and Signature of Convener & Members of CBOs:

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)

DEPARTMENT OF COMPUTER APPLICATION

COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application
(Certificate / Diploma / Degree/Honors)

Semester – II

Session: 2024-2025 /
25-26

1	Course Code	CASC -06T
2	Course Title	Data Structure
3	Course Type	DSC (Discipline Specific Course)
4	Prerequisite (if, any)	As per program
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Understand the fundamentals and applications of data structure. • Utilize various algorithms for real world problem solving. • Understanding about data management in computer memory. • Apply stack, Queue, Lists, Trees and Graphs for real world application. • Understand how various data structures can be used to implement through any programming language.
6	Credit Value	3 Credits
7	Total Marks	<div>Credit = 15 Hours - Learning & Observation</div> <div>Max. Marks: 100 Min Passing Marks: 40</div>

PART -B: Content of the Course

Total No. of Teaching–Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	Introduction and Basic Concepts: Introduction, Fundamentals of Algorithms, Data types: Primitive, Non-Primitive, Abstract Data Type (ADT). Classification of Data Structure: Linear and Nonlinear Data Structure. Array: Arrays and its types, Memory allocation and address calculations of Array, Sparse Array. Linked List: Types of Linked List and various Operations Like INSERT, DELETE, TRAVERSE. Introduction and Application of Stack and Queue.	12
II	Stack: Definition, Operations PUSH, POP, Implementations using Array and Linked list. Applications of Stack: Infix, Prefix, Postfix representation and conversion using Stack, Postfix expression evaluation using Stack, Recursion using Stack. Queue: Definition, Types of Queues: Priority Queue, Circular queue, Double Ended Queue, operations of Queue INSERT, DELETE, TRAVERSE, Implementation Queue using Array and Linked list, Applications of Queue.	11
III	Tree: Definition of Trees and their types, Binary trees, Properties of Binary trees and operations Insertion, deletion, searching and traversal algorithm: preorder, post order, in-order traversal, Binary Search Trees, Implementations, AVL Trees. 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.	11
IV	Sorting Methods: Types of Sorting Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Radix Sort. Searching: Linear search, Binary search.	11

Keywords: Data, ADT, Array, Linked List, Stack, Queue, Tree, Graph, Searching, Sorting

Name and Signature of Convener & Members of CBoS:

Dr. A.S. Horg
Chairman (Dr. K.B. Dubey)
Sushil Kumar (Sushil Kumar Sahu)
Balu (BRSK Sah)
Suresh Kumar
Anil Sharma
Shalini Agn
Anjeeta Khatun
Dr. A.S. Sharma

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Michael T. Goodrich, Data Structures and Algorithms in C++, Wiley
- Horowitz and Sahani, Fundamentals of Data Structures, Computer Science Press

Reference Books Recommended:

- Alfred V. Aho, Data structures and Algorithms, Jhon E. Hopcroft and J.E. Ullman.
- Jean Paul Trembley and Paul Sorenson, An Introduction to Data Structures with Applications, TMH, International Student Edition
- R. Kruse, Leung & Tondo, Data Structures and Program Design in C, PHI publication, 2nd Edition

Online Resources:

- NPTEL YouTube Channel: Data Structure Complete course
- <https://youtube.com/playlist?list=PLc2MoXNv7E4mtsPlnn9BnTOENXsGyoDgR&si=aAYaVZ-vWfeuhFEO>
- NPTEL YouTube Channel: Introduction to Data Structure
- <https://www.youtube.com/watch?v=zWg7U0OEAOE&list=PLBF3763AF2E1C572F&index=1>
- NPTEL YouTube Channel: Stacks
- <https://www.youtube.com/watch?v=gIUSSZVWDsY&list=PLBF3763AF2E1C572F&index=2>
- NPTEL YouTube Channel: Queues and linked list
- <https://www.youtube.com/watch?v=PGWZUgzDMYI&list=PLBF3763AF2E1C572F&index=3>
- NPTEL YouTube Channel: Trees
- <https://www.youtube.com/watch?v=tORLeHHtazM&list=PLBF3763AF2E1C572F&index=6>
- NPTEL YouTube Channel: Graphs
- <https://www.youtube.com/watch?v=9zpSs845wf8&list=PLBF3763AF2E1C572F&index=24>
- W3schools Data Structure Reference: [DSA Tutorial \(w3schools.com\)](https://www.w3schools.com/dsa/)

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

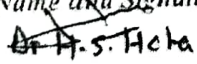
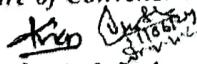
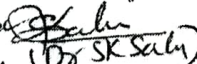
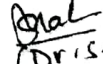

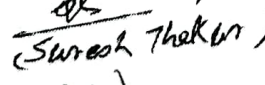
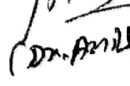
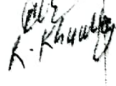



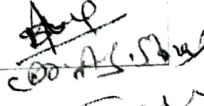

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
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End Semester Exam (ESE):	Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 = 20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks
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Name and Signature of Convener & Members of CBoS:

   
 Chairman (Dr. K. B. Dubey) (Dr. S. K. Sahu) (Dr. S. Jain)
   
 (Sushil Kumar) (Suresh Thakur) (Dr. Anil Kumar) (Dr. Anil Kumar)
   
 (Anam) (Anam) (Anam) (Anam)
 ANJEETA KUMAR


FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application (Certificate / Diploma / Degree)		Semester – II	Session: 2024-2025, 25-26
1	Course Code	CASC-06P	
2	Course Title	Lab 4: Data Structure Using C++	
3	Course Type	Practical	
4	Prerequisite (if, any)	As per program	
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Understand how the concept of data structure can be implemented programmatically. • Implement the fundamentals data structure through C and C++ • Understand the functioning of Array and linked list programmatically. • Understand the applications of array, linked list stack, queue, tree and graph programmatic. • Write programs for various data structures for real world application. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20

PART -B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./Field Training/ Experiment	<ol style="list-style-type: none"> 1. Write a program to create a square matrix, fill the data inside and print the diagonal elements. 2. Write a program to perform addition and subtraction on two matrices. 3. Write a program to perform multiplication on two matrices. 4. Write a program to perform insertion, deletion of nodes from the end in singly linked list. 5. Write a program to perform insertion and deletion of nodes from the end in singly linked list. 6. Write a program to perform insertion and deletion of nodes from the end in circular doubly linked list. 7. Write a program to perform push and pop operations in stack, where stack should be created using array. 8. Write a program to perform push and pop operation in stack, where stack should be created linked list. 9. Write a program to calculate factorial of given number using stack. 10. Write a program to perform insertion and deletion of data items in queue, queue should be implemented by using a linked list. 11. Write a program to perform insertion and deletion of data items in queue, queue should be implemented by using arrays. 12. Write a program to demonstrate functioning of a double ended queue. 13. Write a program to read the postfix arithmetic expression and evaluate its value using the stack. 14. Write a program to show how to handle the overflow and underflow situation in stack. 15. Write a program to convert infix notation-based expression into the postfix notation-based expression using the stack. 16. Write a program to implement the concept of priority-based element 	30





- ## PART -D: Assessment and Evaluation

Managed by
Course teacher as
per lab. status

St. John

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)

DEPARTMENT OF COMPUTER APPLICATION

COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application

Semester - I

Session: 2024-2025,
25-26

(Certificate / Diploma / Degree/Honors)

1	Course Code	CAGE-021
2	Course Title	Operating System
3	Course Type	DGE (Discipline Generic Elective)
4	Prerequisite	As per program
5	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> Understand the concept of operating system. Understand the Disk operating system (DOS). Work with DOS using DOS commands. Understand the Windows operating system. Understand the Linux operating system.
6	Credit Value	3 Credits Credit = 15 Hours - Learning & Observation
7	Total Marks	Max. Marks: 100 Min Passing Marks: 40

PART -B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	Operating System Concepts: Evolution of Operating Systems, Types of operating systems. Operating system structure. Generations of Operating System, Function and Services of Operating System, System Calls, System Boot, System Programs, Protection and Security of Operating System.	12
II	Disk Operating System: Introduction to DOS, History of DOS, Booting process of DOS. File & directory structure and naming rules. DOS system files. Internal commands of DOS - DIR, CLS, VER, VOL, DATE, TIME, COPY, TYPE, REN, DEL, CD, MD, RD, PATH etc. External Commands - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS.	11
III	Windows: Windows Operating System: History, Version and features of Windows. Basics of Windows, Windows concepts, Windows Structure, Desktop, Taskbar, Start Menu, working with files and folders, create, copy, delete, renaming and moving files and folders, working with recycle bin restoring deleted files, emptying the recycle bin, searching files and folders. Windows Explorer, Windows Accessories, Control Panel, Print Manager and Installing Printers. My computer, Media Player, Sound Recorder, Volume Control. Advanced features of Windows - Managing Hardware & Software Add or remove Hardware devices to/from computer, Add/remove programs, Backup, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information windows update.	11
IV	Linux: Linux introduction, Advantages, Features of Linux, Basic Architecture of Unix/Linux system, Kernel, Shell, Linux File system, Linux standard directories. Partitioning the Hard drive for Linux, Installing the Linux system, System, startup and shut-down process, How Linux works, Linux GUI, Linux Desktop, Linux command cd, md, rm, mv, cp, ls, cat, find, grep, head, and tail.	11

keywords: Operating System, DOS, Windows, Linux.

Name and Signature of Convener & Members of CBOS:

Dr. Ashwini
Chairman

Krishna
(Swarosh Kulkarni)

Dr. S. Jain

Shilpika Arora

Shilpika Arora

Shilpika Arora

ANJETA KUL

(Amari)

(M)

Rishi

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Baer Galvin, Greg Gagne, Operating System Concepts – Abraham Silberschatz, 8th edition, Wiley-India, 2009.
- Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, PHI
- Elmasri, Carrick, Levine, Operating Systems: A Spiral Approach – TMH Edition

Reference Books Recommended:

- Akshay Singh, Operating System, RGCSM Publications
- Russell A Stultz, MS DOS 6.22, BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications.
- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- Fundamentals of Computer, Windows Operating System: <https://vikaspedia.in/education/digital-literacy/it-literacy-courses-in-associating-with-msup/computer-fundamentals>
- Introduction to Operating System: <https://www.w3schools.in/operating-system/tutorials/>
- Introduction to Operating System: <https://www.javatpoint.com/windows>
- Windows : <https://www.javatpoint.com/windows>
- Linux: <https://www.javatpoint.com/what-is-linux>
- DOS: <https://www.geeksforgeeks.org/ms-dos-operating-system/>
- DOS : <https://www.javatpoint.com/ms-dos-operating-system>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 & 20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4=20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks	

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

(Suresh Thakur)

(Jyoti Kumar)

(Anurag)

(Dr. S. Jain)

(Sushanta Ray)

(Anjeeta Kujur)

(Amari)

(T. K. K)

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)

DEPARTMENT OF COMPUTER APPLICATION

COURSE CURRICULUM

PART- A: Introduction

Program: Bachelor in Computer Application (Certificate / Diploma / Degree)		Semester - I	Session: 2024-2025, 25-26
1	Course Code	CAGE-02P	
2	Course Title	Lab 2: Operating System	
3	Course Type	Practical	
4	Prerequisite	As per program	
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> Understand the fundamental concepts of DOS, Windows and Linux Operating System. Understand basics of DOS commands and its types. Understand features of Windows Operating system. Understand comparative features of DOS and Windows Operating systems. Explore functionality of Linux. 	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field Learning/Training
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20

PART -B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
List of Practical Experiment	<ol style="list-style-type: none"> Demonstrate different Directory naming listing structure with all options. Create one file and rename file using DOS command Demonstrate all Internal DOS Commands with Output. Demonstrate all external DOS Commands with output. Introduction to Windows and Familiarity with its controls. Study and use of Desktop, my computer, recycle bin, Task bar. Working with Files and Folder. Use of various window applications: Calculator, notepad and MS-Paint. Explaining control panel options. Working with printers. Create a file using Linux command. Write a Linux command which lists all files and directories. Demonstrate use of grep command. Create Directory using Linux command and create 3 different files in this directory. Delete above created files and directory using Linux command. Explaining various flavors of Linux. <p>Note: Concerned teacher can add additional experiment as per requirement.</p>	30

Keywords DOS, Windows, Linux.

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hota
Chairman

Shubil

Shree L. Thakur

Shri. Laxmi Agar

Dr. S. Sain

Shri. Sain

Shri. Sain

ANJETA KUTIA

(Amari)

Shri. Sain

Shri. Sain

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Russell A Stultz, MS DOS 6 22 BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications

Reference Books Recommended:

- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Akshay Singh, Operating System, RGCSM Publications
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- DOS: <https://www.javatpoint.com/ms-dos-operating-system>
- Windows: <https://www.javatpoint.com/windows>
- Linux: <https://www.javatpoint.com/what-is-linux>
- Fundamentals of Computer, Windows Operating System:
<https://vikaspedia.in/education/digital-literacy/it-literacy-courses-in-associating-with-msup/computer-fundamentals>
- DOS: <https://www.geeksforgeeks.org/ms-dos-operating-system/>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test : Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar + Attendance - 05	
	Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	
	A. Performed the Task based on lab. work - 20 Marks	
	B. Spotting based on tools & technology (written) - 10 Marks	
	C. Viva-voce (based on principle/technology) - 05 Marks	
	Managed by Course teacher as per lab. status	

Name and Signature of Convener & Members of CBoS:

Dr. H.S. Hora
Chairman

Sunil

(Stores & Takers)

Shashidhar
Amr

Dr. S. S. Rani

ANJEETA KUMAR

(Amari)

Dr. S. S. Rani

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF COMPUTER APPLICATION
COURSE CURRICULUM

PART-A: Introduction

Program: Bachelor in Computer Application (Certificate / Diploma / Degree/Honors)		Semester – II/IV/V/VI	Session: 2024-2025, 25-26
1	Course Code	CASEC-01	
2	Course Title	ICT Based Learning	
3	Course Type	SEC (Skill Enhancement Course)	
4	Prerequisite	As per program	
5	Course Learning Outcomes(CLO)	At the end of this course, students will be able to: <ul style="list-style-type: none"> Understand the concept of ICT. Understand the concept of Blended learning. To provide knowledge about various OER resources Create document using tools word, Google Docs Learn about various Google tools. 	
6	Credit Value	2 Credits (1C+1C)	Credit =15 Hours Theoretical Learning and = 30 Hours Laboratory or Field Learning/Training
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20

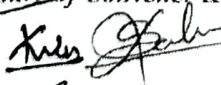

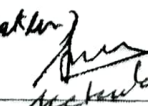
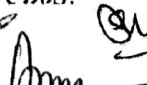
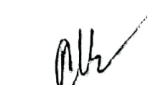



PART – B: Content of the Course

Total No. of Teaching– Learning Periods (01 Hr. per period) - 30 Periods (30 Hours)

Unit	Topics (Course contents)	No. of Period
Theory Content	1. ICT in Education: Concept & Importance of ICT, Need of ICT in Education. 2. Blended Learning: Introduction, terminology, types of Blended Learning Models, Advantages and Disadvantages, Benefits of Blended Learning. 3. E-Learning and Web Based Learning: E-Learning, Web Based Learning, Virtual Classroom, EDUSAT. 4. Open Educational Resources: Introduction, Advantages & Disadvantages of OER, OER Tools Like Google Classroom, various OER.	15
Lab/Field Training Content	Presentation Tools – MS Word, MS Excel, MS PowerPoint, WPS Office. Google Tools- Google Forms, Google Classroom, Google Meet, Google Docs, Google Sheet, Google Slides. Meeting Management Tools- Different Types of Meeting Tools Like Google Meet, Zoom, Skype etc.	30

Keywords Blended Learning, Open Educational Resource, Google.

Name and Signature of Convener & Members of CBoS:

Dr. H. S. Hota  Chairman
 Anshu Thakur
 Shilendra Singh
 Anjali
 Yash
 Anjeeta Kujur
 Aman
 Tushar

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Agarwal J.P. (2013): Modern Educational Technology Black Prints, Delhi
- Barton, R. (2004): Teaching Secondary Science with ICT. McGraw Hill International

Reference Books Recommended:

- Bhaskar Rao (2013): Samachara Prasara Sankethika vidya Shastramu, Masterminds, Guntur
- Cambridge, D (2010) E-Portfolios for Lifelong Learning and Assessment John Wiley and Sons

Online Resources:

- <https://www.unesco.org/en/communication-information/open-solutions/open-educational-resources>
- National Digital Library of India : <https://www.ndl.gov.in/>
- SWAYAM PORTAL: <https://www.swayam.gov.in>
- E-Gyankosh: <https://egyankosh.ac.in/>

PART-D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA): 15 Marks

End Semester Exam(ESE): 35 Marks

Continuous Internal Assessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 + 10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar- 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory/Field Skill Performance: On spot Assessment	
	A. Performed the task based on learned skill - 20 Marks	Managed by Coordinator as per skilling
	B. Spotting based on tools (Written) - 10 Marks C. Viva-voce (based on principle/technology)- 05 Marks	

Name and Signature of Convener & Members of CBaS:

Dr. H.S. Hora
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Krishna
(Suresh Thakur)

Dr. V. K. Choudhary

Shri. V. K. Choudhary

Dr. P. M. S.

Dr. P. M. S.

Dr. P. M. S.

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