



श्री Davara University

Established under Chhattisgarh Private Universities (Establishment and Operation) Act, 2005

# BCA

## SEMESTER-II

### Programme Curriculum



**SEMESTER II**

S.NO	COURSE CODE	COURSE TITLE	TEACHING HOURS PER WEEK				EXAMINATION SCHEME				TOTAL MARKS
			L	T	P	C	THEORY		PRACTICAL		
DISCIPLINE SPECIFIC CORE						EX	IN	EX	IN		
1.	CASC-04	Digital Electronics	3	1	0	4	70	30	-	-	100
2.	CASC-05T	Programming in C++	3	-	0	3	70	30	-	-	100
3.	CASC-06T	Data Structure	3	-	0	3	70	30	-	-	100
<b>GENERAL ELECTIVE</b>											
4.	DUECOSC-02	Basics of Indian Economy	4	-	0	4	70	30	-	-	100
<b>ABILITY ENHANCEMENT COURSE</b>											
5.	DUHIAEC-01	Hindi	2	-	0	2	35	15	-	-	50
<b>SKILL ENHANCEMENT COURSE</b>											
6.	CASEC-01	Artificial Intelligence	2	-	-	2	35	15	-	-	50
<b>PRACTICAL LAB</b>											
7.	CASC-05P	Programming in C++	-	-	2	1	-	-	35	15	50
8.	CASC-06P	Data Structure	-	-	2	1	-	-	35	15	50
<b>Total Credit: 20</b>							<b>Total Marks: 600</b>				



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**FOUR YEAR UNDERGRADUATE PROGRAMME (2025-29)**

**DEPARTMENT OF COMPUTER APPLICATION**

**COURSE CURRICULUM**

<b>PART-A:Introduction</b>		
<b>PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)</b>	<b>Semester-II</b>	<b>Session: 2025-2029</b>
<b>Course Code</b>	<b>CASC-04</b>	
<b>Course Title</b>	<b>Digital Electronics</b>	
<b>Course Type</b>	<b>DSC (Discipline Specific Course)</b>	
<b>Prerequisite</b>	<b>As per PROGRAMME</b>	
<b>Course Learning Outcomes (CLO)</b>	<b>At the end of this course, the students will be able</b> <ul style="list-style-type: none"><li>• To understand fundamental concept of Digital electronic.</li><li>• Understand how computer system identifies the data inside.</li><li>• To understand and examine the structure of various number system.</li><li>• To perform basic arithmetic calculations in binary and hexadecimal.</li><li>• The ability to understand, analyze and design various combinational and sequential circuit.</li><li>• To identify the basic requirement according to the specification for to a newly customized digital circuit and design it in a cost effective manner.</li></ul>	
<b>Credit Value</b>	<b>4 Credits</b>	<b>1 Credit = 15 Hours - Learning &amp; Observation</b>
<b>Total Marks</b>	<b>Max. Marks:100</b>	<b>Min marks -40</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-Learning Periods (01 Hr. per period)-60 Periods (60 Hours) No. of Topics (Course contents)</b>		
<b>Unit</b>	<b>Topics (Course Content)</b>	<b>No. of Period</b>
<b>I</b>	<b>Number System and Data Representation:</b> Introduction of number system (binary, decimal, octal, hexadecimal), inter – conversion between number systems, arithmetic operations, complements in number system, representation of numeric data (binary representation of integers, fixed point and floating point data representation), codes and its classification(weighted codes and its types like NBCD, non weighted codes like (Excess -3 code Gray Code etc. ) alphanumeric code like (ASCII, UNICODE, EBCDIC, etc), Error detecting code like (parity bit coding techniques) Error Correcting codes like (hamming code)	<b>15</b>
<b>II</b>	<b>BOOLEAN ALGEBRA:</b> Boolean algebra and basic operations, sum of product, product of sum, simplification of Boolean expression using simplification techniques: Boolean laws and K-Map. <b>FUNDAMENTALS OF DIGITAL CIRCUIT DESIGN:</b> 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 circuits, sequential circuits)	<b>15</b>



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<b>III</b>	<b>COMBINATIONAL CIRCUIT:</b> Adder (half adder, full adder, N bit adder), Subtractor (half subtractor, full subtractor, N bit subtractor), Decoder, Encoder, Multiplexer, De-multiplexer, Comparator, Code Convertor <b>SEQUENTIAL CIRCUIT:</b> 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.	<b>15</b>
<b>IV</b>	<b>MICROPROCESSORS:</b> 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)	<b>15</b>
<b>Keywords</b>	Number System, Logic Gates, Combinational Circuits, Sequential Circuits, flip-flop, Registers, Counters, Microprocessors	

**Name and Signature of Convener & Members of CBoS**

### **PART-C: Learning Resources**

**Text Books, Reference Books and Others**

**Text books recommended:**

- D. Nasib, S Gill, J.B. Dixit, Digital Design and computer organization, Laxmi Publication
- K.K Neniwal, Digital Electronics(Hindi), Paperback Publication

**Reference Books Recommended:**

- M. Morris Mano, Digital Logic and computer design
- A. K, Maini, Digital Electronics Principles, Devices and Application, John Wiley and Sons,Ltd.

### **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

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

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**FOUR YEAR UNDERGRADUATE PROGRAMME (2025-29)**

**DEPARTMENT OF COMPUTER APPLICATION**

**COURSE CURRICULUM**

<b>PART-A: Introduction</b>		
<b>PROGRAMME: Bachelor in Computer Application</b> (Certificate/Diploma/Degree/Honors)	<b>Semester-II</b>	<b>Session: 2025-2025</b>
<b>Course Code</b>	<b>CASC-05T</b>	
<b>Course Title</b>	<b>Programming in C++</b>	
<b>Course Type</b>	<b>DSC (Discipline Specific Course)</b>	
<b>Prerequisite</b>	<b>As per PROGRAMME</b>	
<b>Course Learning Outcomes (CLO)</b>	<p><b>At the end of this course, the students will be able</b></p> <ul style="list-style-type: none"> <li>To understand the fundamental concept of object oriented Programming.</li> <li>Write Programming related to concept of object oriented Programming.</li> <li>Define function, class, and to create own libraries.</li> <li>Write Programs for file handling.</li> <li>Develop small Programs to solve real world Problem.</li> </ul>	
<b>Credit Value</b>	<b>3 Credits</b>	<b>1 Credit = 15 Hours - Learning &amp; Observation</b>
<b>Total Marks</b>	<b>Max. Marks:100</b>	<b>Min marks -40</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)</b>		
<b>Unit</b>	<b>Topics (Course Content)</b>	<b>No. of Period</b>
<b>I</b>	<b>Introduction and Programming concepts:</b> Definition of PROGRAMME, 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 PROGRAMME, 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.	<b>12</b>
<b>II</b>	<b>Introduction to Object Oriented Programming:</b> Concept of object oriented Programming, Features C++, Structure of C++ PROGRAMME, Data types, structure, class and objects, Access Specifiers: Private, Public, Protected, inline functions, static data and static functions. <b>Constructor:</b> Default constructor, Copy constructor, Parameterized constructor, Destructor.	<b>11</b>
<b>III</b>	<b>Inheritance:</b> Definition, Concept of base and derived class, Types of Inheritance: Single, Multilevel, Multiple. Hierarchical and Hybrid Inheritance <b>Polymorphism:</b> Definition, Compile time polymorphism: Function overloading, Operator overloading, constructor overloading, Runtime polymorphism: Virtual Function, pure virtual function. Inline function, friend function, friend class.	<b>11</b>



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<b>IV</b>	<b>Input-Output and File Handling:</b> I/O classes, File and Stream classes, Char I/O, String I/O, Object I/O, File Pointer, Opening and Closing file. <b>Exception Handling and Standard Template Library:</b> Definition, Exception basics, try, catch and throws keywords, Template.	<b>11</b>
<b>Keywords</b>	Token, Identifier, Keyword, Array, Function, Class, Object, Polymorphism, Inheritance, Constructor, Template.	

**Name and Signature of Convener & Members of CBoS**

### **PART-C: Learning Resources**

**Text Books, Reference Books and Others**

**Text Books Recommended:**

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

**Reference Books Recommended:**

- Peter Juliff, PROGRAMMEDesign, PHI publication,
- Yashwant Kanetkar, Let Us C: BPB Publication.
- E. Balaguruswamy Programming in ANSI C, Tata McGraw Hill.

### **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

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



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**FOUR YEAR UNDERGRADUATE PROGRAMME (2025-29)**

**DEPARTMENT OF COMPUTER APPLICATION**

**COURSE CURRICULUM**

<b>PART-A: Introduction</b>		
<b>PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)</b>	<b>Semester-II</b>	<b>Session: 2025-2029</b>
<b>Course Code</b>	<b>CASC-05P</b>	
<b>Course Title</b>	<b>Programming in C++</b>	
<b>Course Type</b>	<b>Practical</b>	
<b>Prerequisite</b>	<b>As per PROGRAMME</b>	
<b>Course Learning Outcomes (CLO)</b>	<b>At the end of this course, the students will be able</b> <ul style="list-style-type: none"><li>• To understand the fundamental concept of object oriented programming.</li><li>• Write PROGRAMMEs related to concept of object oriented Programming.</li><li>• Define function, class, and to create own libraries.</li><li>• Write Programs for file handling.</li><li>• Develop small Programs to solve real world Problem.</li></ul>	
<b>Credit Value</b>	<b>1 Credits</b>	<b>1 Credit = 30 Hours – Lab practical's &amp; training</b>
<b>Total Marks</b>	<b>Max. Marks:50</b>	<b>Min marks -20</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)</b>		
<b>Module</b>	<b>Topics(Course Content)</b>	<b>No. of Period</b>
<b>List of practical's Experiments</b>	<ol style="list-style-type: none"><li>01. Write a PROGRAMME in C++ for addition of two numbers using float data type.</li><li>02. Write a PROGRAMME in C++ to find the biggest number between two numbers.</li><li>03. Write a PROGRAMME in C++ to find the factorial value of any entered number using do- while loop.</li><li>04. Write a PROGRAMME in C++ for various arithmetic operations using switch case statements.</li><li>05. Write a PROGRAMME in C++ for Multiplication of two 3X3 matrices.</li><li>06. Write a PROGRAMME in- C++ to store five books of information using-structure.</li><li>07. Write a PROGRAMME in C++ to store six employee information using union.</li><li>08. Write a PROGRAMME in C++ to calculate simple interest using call by value and call by reference method.</li><li>09. Write a PROGRAMME in C++ to find the sum and average of five numbers using class and objects.</li><li>10. Write a PROGRAMME in C++ to multiply two numbers using private and</li></ol>	<b>30</b>



- public member functions.
11. Write a PROGRAMME in C++ to print structure like this using scope resolution operator  
1  
2  
123  
1234  
12345
  12. Write a PROGRAMME in C++ for constructor and Destructor.
  13. Write a PROGRAMME in C++ for multiple inheritance.
  14. Write a PROGRAMME in C++ for operator overloading.
  15. Write a PROGRAMME in C++ for friend class and friend function.
  16. Write a PROGRAMME in C++ for virtual function and virtual class.
  17. Write a PROGRAMME in C++ for Exception Handling.
  18. Write a PROGRAMME in C++ to open and close a file using file Handling.
  19. Given two ordered arrays of integers, write a PROGRAMME 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 menu-driven PROGRAMME to perform following Matrix Operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose
  24. 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).
  25. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
  26. Create a class Box containing length, breadth and height. Include following methods in it:
    - a) Calculate surface Area
    - b) Calculate Volume
    - c) Increment, operator (both prefix & postfix)
    - d) Decrement, Overload 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
  27. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
  28. Write a PROGRAMME to retrieve the student information from the file created in the previous question and print it in the following format: Roll No. Name Marks
  29. Copy the contents of one text file to another file, after removing all whitespaces.
  30. Write a PROGRAMME for exception handling.
  31. Write a PROGRAMME to insert data into file and to display it.
- Note: Concerned teacher can add additional experiment as per requirement



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### PART-C: Learning Resources

**Text Books, Reference Books and Others**

**Text Books Recommended:**

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

**Reference Books Recommended:**

- Peter Juliff, PROGRAMME Design, PHI publication,
- Yashwant Kanetkar, Let Us C: BPB Publication.
- E. Balaguruswamy Programming in ANSI C, Tata McGraw Hill.

### 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:-10 & 10  
Assignment /seminar-05  
Total marks:-15**

**Better marks out of the two  
test/Quiz+ obtained marks in  
assignment shall be considered  
against 15 marks.**

**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)-10marks**  
**C. Viva-voce(based on principle/technology)- 5 marks**

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**FOUR YEAR UNDERGRADUATE PROGRAMME (2025-29)**  
**DEPARTMENT OF COMPUTER APPLICATION**  
**COURSE CURRICULUM**

<b>PART-A: Introduction</b>		
<b>PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)</b>	<b>Semester-II</b>	<b>Session: 2025-2029</b>
<b>Course Code</b>	<b>CASC-06T</b>	
<b>Course Title</b>	<b>Data Structure</b>	
<b>Course Type</b>	<b>DSC (Discipline Specific Course)</b>	
<b>Prerequisite</b>	<b>As per Programme</b>	
<b>Course Learning Outcomes (CLO)</b>	<p><b>At the end of this course, the students will be able</b></p> <ul style="list-style-type: none"> <li>Understand and fundamental of data structure.</li> <li>Utilize various algorithms for real world problem solving.</li> <li>Understand about data management in computer memory.</li> <li>Apply stack, queue, lists, trees, and graphics form real world.</li> <li>Understand how various data structure can be used to implement through any Programming language.</li> </ul>	
<b>Credit Value</b>	<b>3 Credits</b>	<b>1 Credit = 15 Hours - Learning &amp; Observation</b>
<b>Total Marks</b>	<b>Max. Marks:100</b>	<b>Min marks -40</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)</b>		
<b>Unit</b>	<b>Topics(Course Content)</b>	<b>No. of Period</b>
<b>I</b>	<p><b>Introduction and Basic Concepts:</b> Introduction, Fundamentals of Algorithms, Data types: Primitive, Non-Primitive Absent Data Type (ADT), Classification of Data Structure: Linear and Nonlinear Data Structure. <b>Array:</b> Arrays and its types, Memory allocation and address calculations of Array, Sparse Array. <b>Linked List:</b> Types of Linked List and various Operations Like INSERT, DELETE, TRAVERSE. Introduction and Application of Stack and Queue.</p>	<b>12</b>
<b>II</b>	<p><b>Stack:</b> 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.</p> <p><b>Queue:</b> 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</p>	<b>11</b>



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<b>III</b>	<b>Tree:</b> 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. <b>Graph:</b> 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	<b>11</b>
<b>IV</b>	<b>Sorting Methods:</b> Types of Sorting Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Radix Sort. <b>Searching:</b> Linear search, Binary search.	<b>11</b>
<b>Keywords</b>	Data, ADT, Array, Linked List, Stack, Queue, Tree, Graph, Searching, Sorting.	

**Name and Signature of Convener & Members of CBoS**

### PART-C: Learning Resources

**Text Books, Reference Books and Others**

**Text Books Recommended:**

- Michael T, Goodrich Data Structure and algorithm in C++, Wiley
- Horowitz and Sahani fundamentals of data structure computer Science Press

**Reference Books Recommended:**

- Alfred v. Aho, data structure and algorithm
- Jean Paul Trembley and Paul Sorenson

### 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:-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 marks: Q2. Short answer type-5x4=20 marks  
Section B: Descriptive answer type question, 1 out of 2 from each unit-  
4x10=40 marks**

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## FOUR YEAR UNDERGRADUATE PROGRAMME (2025-29)

### DEPARTMENT OF COMPUTER APPLICATION

### COURSE CURRICULUM

<b>PART-A: Introduction</b>		
<b>PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)</b>	<b>Semester-II</b>	<b>Session: 2025-2029</b>
<b>Course Code</b>	<b>CASC-06P</b>	
<b>Course Title</b>	<b>Lab 4-Data Structure Lab</b>	
<b>Course Type</b>	<b>Practical</b>	
<b>Prerequisite</b>	<b>As per Programme</b>	
<b>Course Learning Outcomes (CLO)</b>	<p><b>At the end of this course, the students will be able</b></p> <ul style="list-style-type: none"> <li>Understand and fundamental of data structure.</li> <li>Utilize various algorithms for real world problem solving.</li> <li>Understand about data management in computer memory.</li> <li>Apply stack, queue, lists, trees, and graphics form real world.</li> <li>Understand how various data structure can be used to implement through any Programming language.</li> </ul>	
<b>Credit Value</b>	<b>1 Credits</b>	<b>1 Credit = 30 Hours – Lab practical’s &amp; training</b>
<b>Total Marks</b>	<b>Max. Marks:50</b>	<b>Min marks -20</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)</b>		
<b>Module</b>	<b>Topics(Course Content)</b>	<b>No. of Period</b>
<b>List of practical’s Experiments</b>	01. Write a PROGRAMME to create a square matrix, fill the data inside and print the diagonal elements. 02. Write a PROGRAMME to perform addition and subtraction on two matrices. 03. Write a PROGRAMME to perform multiplication on two matrices. 04. Write a PROGRAMME to perform insertion, deletion of nodes from the end in singly linked list. 05. Write a PROGRAMME to perform insertion and deletion of nodes from the end in a circular doubly linked list. 06. Write a PROGRAMME to perform push and pop operations in stack, where stack should be created using array. 07. Write a PROGRAMME to perform push and pop operation in stack, where stack should be created linked list. 08. Write a PROGRAMME to calculate factorial of given number using stack. 09. Write a PROGRAMME to perform insertion and deletion of data items in queue. Queue should be implemented by using a linked list. 10. Write a PROGRAMME to perform insertion and deletion of data items in queue. Queue should be implemented by using arrays. 11. Write a PROGRAMME to demonstrate functioning of a double ended queue. 12. Write a PROGRAMME to read the postfix arithmetic expression and evaluate its value using the stack.	<b>30</b>



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	<ol style="list-style-type: none"> <li>13. Write a PROGRAMME to show how to handle the overflow and underflow situation in stack.</li> <li>14. Write a PROGRAMME to convert infix notation-based expression into the postfix notation-based expression using the stack.</li> <li>15. Write a PROGRAMME to implement the concept of priority-based element traversing using priority queue.</li> <li>16. Write a PROGRAMME to create binary search tree using the concept of linked list and array, suppose data set will be given at the run time.</li> <li>17. Write a PROGRAMME to create a binary tree with any data set and traverse the data items in pre-order, in-order and post-order manner using recursion.</li> <li>18. Write a PROGRAMME to perform deletion of any data item from the binary search tree.</li> <li>19. Write a PROGRAMME to find the height of any tree.</li> <li>20. Write a PROGRAMME to create any given undirected graph using the adjacency matrix, and print each node/element with list of its adjacent elements.</li> <li>21. Write a PROGRAMME to find the height of any given tree.</li> <li>22. Write a PROGRAMME to traverse the element of given graph according BFS and DFS.</li> <li>23. Write a PROGRAMME to find the minimum spanning tree of any given graph.</li> <li>24. Write a PROGRAMME to search any run time given element from the array of 10 elements in the array are unsorted.</li> <li>25. Write a PROGRAMME to demonstrate the binary search.</li> <li>26. Write a PROGRAMME to find the smallest and largest element in any array.</li> <li>27. Write a PROGRAMME to arrange the data items of any array in ascending order.</li> <li>28. Write a PROGRAMME to arrange the data items of any array in descending order using quick sort.</li> </ol>	
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<b>Keywords</b>	Keyword: Array, Linked List, Stack, Queue, traversing, Tree, Graph, Searching, Sorting, Hashing.
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**PART-C: Learning Resources**

**Text Books, Reference Books and Others**

**Text Books**

- Michael T, Goodrich Data Structure and algorithm in C++,Wiley
- Horowitz and Sahani fundamentals of data structure computer Science Press

**Reference Books Recommended:**

- Alfred v. Aho, Data Structure and Algorithm
- Jean Paul Trembley and Paul Sorenson

**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

<b>Continuous Internal</b>	<b>Internal test/Quiz:-10 &amp; 10</b>	<b>Better marks out of the two</b>
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<b>Assessment (CIA): (By Course Teacher)</b>	<b>Assignment /seminar-05 Total marks:-15</b>	<b>test/Quiz+ obtained marks in assignment shall be considered against 15 marks.</b>
<b>End Semester Exam (ESE):</b>	<b>Laboratory/field skill performance: on spot Assessment</b> <b>A. Performed the task based on lab work- 20 marks</b> <b>B. Spotting based on tools &amp; technology(written)-10marks</b> <b>C. Viva-voce(based on principle/technology)- 5 marks</b>	
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**FOUR YEAR UNDERGRADUATE PROGRAMME (2025-29)**

**DEPARTMENT OF ECONOMICS**

**COURSE CURRICULUM**

<b>PART-A: Introduction</b>		
<b>PROGRAMME: Bachelor in Arts (Certificate/Diploma/Degree Honors)</b>	<b>Semester-II</b>	<b>Session: 2025-2029</b>
<b>Course Code</b>	<b>DUECOSC-02</b>	
<b>Course Title</b>	<b>Basics of Indian Economy</b>	
<b>Course Type</b>	<b>Discipline Specific Course</b>	
<b>Pre-requisite(if any)</b>	<b>As per Programme</b>	
<b>Course Learning Outcomes (CLO)</b>	After completion of the course, the student shall be able to. <ul style="list-style-type: none"><li>➤ The students learn about the state of Indian Economy pre and post independence.</li><li>➤ The student's gets and understanding about the planning process and achievement in Indian Economy.</li><li>➤ The student will come to know about social problem like over population, un education, poor health, malnutrition, poverty and unemployment.</li><li>➤ It covers the topics like industrial development, foreign trade in India, role of different factors and their significance.</li><li>➤ The students learn about various industries and infrastructure development of Chhattisgarh.</li></ul>	
<b>Credit Value</b>	<b>4 Credits</b>	<b>Credit =60 Hours-learning &amp; Observation</b>
<b>Total Marks</b>	<b>Max. Marks:=100</b>	<b>Min Passing Marks: 40</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-learning Periods (01 Hr. per period) -45 Periods (45 Hours)</b>		
<b>Unit</b>	<b>Topics (Course contents)</b>	<b>No. of Period</b>
<b>I</b>	<b>An Introduction To Indian Economy</b> 1. Indian Economy At The Time Of Independence 2. Post Independence Indian Economy 3. Development Through Five Year Plans 4. NITI Aayog 5. New Economic Reforms	<b>15</b>
<b>II</b>	<b>Demography</b> 1. Demographic Trends Of India 2. Issues Of Education, Health, Malnutrition And Migration. 3. Poverty And Inequality 4. Unemployment & Occupational Distribution	<b>15</b>
<b>III</b>	<b>Agriculture</b> 1. Nature & Importance Of Agriculture 2. Agriculture Production & Productivity 3. Major Problems In Indian Agriculture 4. Land Use Pattern & Land Reforms 5. New Agriculture Strategies & Green Revolution	<b>15</b>



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<b>IV</b>	<b>Industry &amp; Foreign Trade</b> 1. Industrial Growth & Productivity 2. Industrial Policy & Economic Reforms 3. Micro, Small & Medium Industries (MSME) 4. Problems Of Small Scale Industries 5. Public Enterprises In India 6. Role Of Foreign Trade In India's Development	<b>15</b>
<b>Keywords</b>	<b>Political theory, state, sovereignty, right, they, democracy, constitution, party.</b>	
<b>Signature of Convener &amp; Members (CBoS)</b>		

### **PART-C: Learning Resources**

#### **Text Books, Reference Books and Others**

##### **Text books and Reference Books recommended:**

- Uma Kapila ,India Economy: Performance & Policies, Academic Foundation
- Datt, Ruddar & K.P.M. Sundharam, Indian Economy S. Chand & Co. new Delhi
- Mishra & Puri, Indian Economy, Himalaya Publishing House
- Govt. of India, Economic Survey (Various Issues), Govt. of India
- Brahmanand, P.R. & V.R. Panchmukhi (Eds), The development process of the Indian Economy, Himalaya Publishing, Mumbai

### **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

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

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<b>PART-A: Introduction</b>		
<b>PROGRAMME:</b> Department of Science (Certificate/Diploma/Degree Honors)	<b>Semester-II</b>	<b>Session:2025-2029</b>
<b>Course Code</b>	<b>DUHIAEC-01</b>	
<b>Course Title</b>	<b>Hindi</b>	
<b>Course Type</b>	<b>AEC (Ability Enhancement Course)</b>	
<b>Pre-requisite(if any)</b>	<b>As per PROGRAMME</b>	
<b>Course Learning Outcomes (CLO)</b>	1- विद्यार्थी हिन्दी भाषा एवं व्याकरण संबंधी ज्ञान से समृद्ध होंगे। 2- भाषा ज्ञान के माध्यम से भारतीय संस्कृति एवं भावनात्मक एकता के महत्व को समझने की क्षमता विकसित हो सकेगी। 3- मुहावरे एवं लोकोक्तियाँ का महत्व समझ सकेंगे। 4- व्यंग्य, निबंध एवं कविता विधा से परिचित होंगे। 5- निबंध लेखन एवं अपठित गद्यांश के माध्यम से विद्यार्थियों का बौद्धिक विकास हो सकेगा।	
<b>Credit Value</b>	<b>2 Credits</b>	<b>Credit = 15 Hours – Learning &amp; Observation</b>
<b>Total Marks</b>	<b>Max. Marks:=50</b>	<b>Min PassingMarks:20</b>
<b>PART-B: Content of the Course</b>		
<b>TotalNo.ofTeaching-learningPeriods (1 hours perperiod)-30Periods(30 Hours)</b>		
<b>Unit</b>	<b>Topics(Course Contents)</b>	<b>No. of Period</b>
<b>I</b>	रचनाएं भारतवंदना-सूर्यकांत त्रिपाठी 'निराला' (कविता) भोलाराम का जीव-हरिश्चंकर परसाई (व्यंग्य) चोरी और प्रायश्चित्त-महात्मा गांधी(निबंध)	<b>8</b>
<b>II</b>	हिन्दी व्याकरण एवं शब्द रचना उपसर्ग, प्रत्यय, संधि, समास पर्यायवाची शब्द, विलोम शब्द, अनेकार्थी शब्द, समश्रुत शब्द, अनेकशब्दों के लिए एक शब्द	<b>7</b>
<b>III</b>	हिन्दी व्याकरण एवं रचनापक्ष मुहावरे एवं लोकोक्तियाँ पारिभाषिक शब्दावली एवं हिन्दी में पदनाम, शब्दशुद्धि, वाक्य शुद्धि	<b>8</b>
<b>IV</b>	रचनात्मक लेखन निबंध लेखन अपठित गद्यांश (नोट-विद्यार्थी को किसी एक विषय पर निबंध व प्रदत्त गद्यांश का शीर्षक तथा सारांश लिखना होगा।)	<b>7</b>
<b>Keywords</b>		
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<b>PART-C: Learning Resources</b>		



**Text Books, Reference Books and Others**

- 1- भारतीयता के अमर स्वर –डॉ. धनंजय वर्मा, मध्य प्रदेश हिन्दी अकादमी
- 2- आधुनिक हिन्दी व्याकरण और रचना–डॉ वासुदेवनंदन
- 3- हिन्दी भाषा और व्यवहार–डॉ. गंगाचरण त्रिपाठी
- 4- हिन्दी व्याकरण माला–डॉ. के. आर. गहिया, डॉ.विमलेश शर्मा
- 5- हिन्दी व्याकरण–कामता प्रसाद गुरु

**Online Resources-**

- <http://libgmm.com>
- [www.bookspace.in](http://www.bookspace.in)
- <http://www.gkexams.com>

**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:-10 & 10  
Assignment /seminar-05  
Total marks:-15**

**Better marks out of the two  
test/Quiz+ obtained marks in  
assignment shall be considered  
against 15 marks.**

**End Semester Exam (ESE):**

**Two section- A&B  
Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks  
Section B: Descriptive answer type question, 1 out of 2 from each unit-  
4x5=20 marks  
Total = 35 marks**

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**FOUR YEAR UNDERGRADUATE PROGRAMME (2025- 29)**

**DEPARTMENT OF COMPUTER APPLICATION**

**COURSE CURRICULUM**

<b>PART-A: Introduction</b>		
<b>PROGRAMME: Bachelor in Computer Application (Certificate/Diploma/Degree/Honors)</b>	<b>Semester-II</b>	<b>Session: 2025-2029</b>
<b>Course Code</b>	<b>CASEC-01T</b>	
<b>Course Title</b>	<b>Artificial intelligence</b>	
<b>Course Type</b>	<b>SEC (Skill Enhancement Course)</b>	
<b>Prerequisite</b>	<b>As per PROGRAMME</b>	
<b>Course Learning Outcomes (CLO)</b>	<p><b>At the end of this course, the students will be able</b></p> <ul style="list-style-type: none"> <li>To understand the basics of AI.</li> <li>To understand problem solving techniques in AI.</li> <li>To aware AI Tools.</li> <li>Explore application in various domains.</li> </ul>	
<b>Credit Value</b>	<b>2 Credits</b>	<b>1 Credit = 15 Hours - Learning &amp; Observation</b>
<b>Total Marks</b>	<b>Max. Marks:50</b>	<b>Min marks -20</b>
<b>PART -B: Content of the Course</b>		
<b>Total No. of Teaching-Learning Periods (01 Hr. per period)-45 Periods (45 Hours) No. of Topics (Course contents)</b>		
<b>Unit</b>	<b>Topics (Course Content)</b>	<b>No. of Period</b>
<b>I</b>	Introduction: overview of artificial intelligence (AI), Foundation of AI, Areas and application of AI in various Domains, AI in India, Impact and examples of AI, Future of AI.	<b>7</b>
<b>II</b>	Advanced AI: basic concept of machine learning, deep learning, computer vision, natural language processing, speech recognition, generative AI application.	<b>7</b>
<b>III</b>	AI Tools: conversational AI: ALEXA, CORTANA, SIRI, etc., AI tools for content generation, image creation, presentation, video editing etc.	<b>8</b>
<b>IV</b>	Application of AI: agriculture, healthcare, environment, teaching, learning, ecommerce, industry, research etc.	<b>8</b>
<b>Keywords</b>	Token, Identifier, Keyword, Array, Function,	
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<b>PART-C: Learning Resources</b>		
<b>Text Books, Reference Books and Others</b>		
<ul style="list-style-type: none"> <li><b>Artificial Intelligence: A Modern Approach</b> <i>Stuart Russell &amp; Peter Norvig</i></li> </ul>		



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- **Artificial Intelligence**  
*Elaine Rich & Kevin Knight*
- **Artificial Intelligence: Foundations of Computational Agents**  
*David L. Poole & Alan K. Mackworth*
- **Machine Learning**  
*Tom M. Mitchell*
- **Pattern Recognition and Machine Learning**  
*Christopher M. Bishop*
- **Deep Learning**  
*Ian Goodfellow, Yoshua Bengio & Aaron Courville*
- **Artificial Intelligence Basics: A Non-Technical Introduction**  
*Tom Taulli*

### **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

<b>Continuous Internal Assessment (CIA): (By Course Teacher)</b>	<b>Internal test/Quiz:-10 &amp; 10 Assignment /seminar-05 Total marks:-15</b>	<b>Better marks out of the two test/Quiz+ obtained marks in assignment shall be considered against 15 marks.</b>
<b>End Semester Exam (ESE):</b>	<b>Two section- A&amp;B Section A: Q1. Objective-05 marks: Q2. Short answer type-5x2=10 marks Section B: Descriptive answer type question, 1 out of 2 from each unit- 4x5=20 marks Total = 35 marks</b>	
<b>Name and Signature of Convener &amp; Members of CBoS.</b>		