



# SHRI VAISHNAV INSTITUTE OF MANAGEMENT & SCIENCE, INDORE

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Approved by AICTE, New Delhi and Affiliated to DAVV, Indore & RGPV, Bhopal, Madhya Pradesh, India UGC-NAAC Accredited 'A' Grade Institute  
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<b>B. Sc(CS) II Semester (Course Details)</b>				
<b>Session : January – June 2026</b>				
<b>Sr. No.</b>	<b>Course Type</b>	<b>Course Code</b>	<b>Subject Name</b>	<b>Total Credits</b>
1	Major - II (Core Course)	BSCCS – 201 (T)	Programming Methodologies & Data Structures (Using C/C++) (Theory)	4
		BSCCS – 201 (P)	Programming Methodologies & Data Structures (Using C/C++) (Practical)	2
2	Major - III (Core Course)	BSCCS – 202 (T)	Operating System & Office Tools (Theory)	4
		BSCCS – 202 (P)	Operating System & Office Tools (Practical)	2
3	Minor - II	BSCCS – 203 (A)	Ordinary Differential Equations (Theory)	4
		BSCCS – 203 (B) (T)	Thermodynamics (Theory)	3
		BSCCS – 203 (B) (P)	Thermodynamics (Practical)	1
4	Ability Enhancement Course	AEC – 201	English Language and Indian Culture	2
5	Value Added Course	VAC – 201	भारत बोध (Understanding India)	2
<b>Total Credits</b>				<b>20</b>



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<b>PART-A : Introduction</b>		
<b>Programme : B.Sc.(CS)</b>	<b>Class : I Year</b>	<b>Semester : II</b>
		<b>Session : January - June 2026</b>
<b>Subject : Computer Science</b>		<b>Theory/Practical : Theory</b>
<b>1.</b>	<b>Course Code</b>	<b>BSCCS – 201 (T)</b>
<b>2.</b>	<b>Course Title</b>	<b>Programming Methodologies &amp; Data Structures (Using C/C++) (Theory)</b>
<b>3.</b>	<b>Course Type</b>	<b>Major – II (Core Course)</b>
<b>4.</b>	<b>Pre-Requisite</b>	To study this course, Mathematics in XII standard is desirable.
<b>5.</b>	<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To enable students to develop strong problem-solving skills through structured programming principles and efficient use of data structures.</li> <li>2. To build the ability to design, analyze, and implement algorithms using iterative, recursive, and data-driven approaches.</li> <li>3. To select appropriate data structures for real-world applications, evaluate complexity, and create optimized solutions.</li> <li>4. To familiarize students with modern programming practices and recognize the contributions of Indian computer scientists in the field of programming and data structures.</li> </ol>
<b>6.</b>	<b>Course Outcomes (COs)</b>	<p>On completion of this course, learners will be able to:</p> <p>CO1. Develop simple algorithms and flow charts to solve a problem with programming using top-down design principles;</p> <p>CO2. Formulate iterative solutions and array processing algorithms for problems;</p> <p>CO3. Use recursive techniques, pointers and searching methods in programming;</p> <p>CO4. Implement fundamental data structures &amp; accustomed to the description of algorithms in both functional and procedural styles;</p> <p>CO5. Understand the complexity of basic operations like insert, delete, search on these data structures.</p> <p>CO6. Select appropriate data structure to suitable to different models;</p> <p>CO7. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs</p>



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		etc.; CO8. Implement and know the applications of algorithms for searching and sorting etc.; CO9. Identify the contributions of Indians in the field of programming and data structures.	
7.	<b>Expected Job Role/career opportunities</b>	Upon successful completion of this course, students will be capable of working in various professional roles such as: <ul style="list-style-type: none"> <li>• Software Developer / Software Engineer</li> <li>• Programmer Analyst</li> <li>• Algorithm and Data Structure Specialist</li> <li>• System Analyst / System Designer</li> <li>• Application &amp; Web Developer</li> <li>• Database Developer</li> <li>• Mobile App Developer</li> <li>• Technical Support and Maintenance Engineer</li> <li>• Research Associate in Computer Science</li> <li>• Quality Assurance / Software Testing Engineer</li> <li>• Junior Data Engineer / Data Analyst</li> </ul>	
8.	<b>Credit Value</b>	<b>Theory:</b> 4 Credits	
9.	<b>Total Marks</b>	<b>Max. Marks:</b> 100	<b>Min, Passing Marks:</b> 35



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<b>PART B: Content of the Course</b>		
<b>No. of Lectures (in hours per week): 2 Hrs. per week</b>		
<b>Total No. of Lectures: 60 Hrs.</b>		
<b>Unit</b>	<b>Topics</b>	<b>No. of Lectures</b>
I	<p>Relevant Indian Knowledge System (IKS) Inclusions: Algorithmic thinking in Ancient India. The Panini Grammar System (Ashtadhyayi). The ChandasShastra (Sanskrit Prosody) a recursive structure, The Brahmagupta Algorithm (7th century CE) an introduction to zero and place value notation.</p> <p>Data Structures &amp; Computational Methods in Ancient India: Vedic method of data structuring - preservation of ancient manuscripts (e.g., Rig Veda) using hierarchical structures. Resemblance of Graph Theory with the Indian Temple Architecture (the connectivity principles of temple design and city planning). Resemblance of efficient Sorting &amp; Searching techniques with Ancient Indian classification methods in Ayurveda &amp; Sanskrit texts. The Buddhist Numerical Sorting Method (Bhāskara II).</p> <p>Introduction to Programming: Program Concept, Characteristics of Programming, Stages in Program Development, Algorithms, Notations, Design, Flowcharts, Types of Programming Methodologies.</p> <p>Introduction to C/C++ Programming: Basic Program Structure in C/C++, Data Types, Variables, Constants, Operators and Basic I/O.</p> <p>Variables: Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar etc.), Formatted and Console I/O [printf(), scanf(), cin(), cout(), Using Basic Header Files (stdio.h, iostream.h, conio.h etc.), Simple Expressions in C/C++ (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions.</p> <p><u>Suggested activities for experiential learning:</u></p> <ol style="list-style-type: none"><li>1. Comparative Analysis: Research how Panini's grammar rules resemble formal grammar in programming languages.</li><li>2. Algorithm Simulation: Implement Brahmagupta's place-value system using C/C++.</li><li>3. Keyword Identification Exercise: Analyze the similarity between Sanskrit syntax and C/C++ keywords (e.g., structure in Sanskrit grammar vs. C/C++ struct).</li><li>4. Basic I/O Project: Implement a console-based quiz using formatted I/O.</li></ol>	10



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II	<p>Conditional Statements if construct, switch-case construct.          Iterative Statements: while, do-while, and for loops, use of break and continue in loops, Using Nested Statements (Conditional as well as Iterative).          Functions: Top-Down Design, Pre-defined Functions, Programmer defined Functions. Local Variables and Global variables, Functions with Default Arguments, Call-By-Value and Call-By-Reference, Parameters, Recursion.          Introduction to Arrays: Declaration and Referring Arrays, Arrays in Memory, Initializing Arrays. Arrays in Functions, Multi Dimensional Arrays.  <u>Suggested activities for experiential learning:</u>          1. Code Debugging Challenge: Assign buggy C/C++ programs for students to debug and improve.          2. Concept Visualization: Use flowcharts and pseudocode tools to map variable types and memory usage.          3. Conditional Logic Game: Design a decision-based game using if-else and switch-case.          4. Function Optimization Task: Analyze and optimize recursive vs. iterative function performance.          5. Nested Loops Visualization: Represent nested loops using Pascal's Triangle visualization.          6. Real-World Decision-Making Simulation: Create a banking/ATM system that demonstrates nested loops and conditional logic.</p>	8
III	<p>Structures: Member Accessing, Pointers to Structures, Structures and Functions, Arrays of Structures.          Unions: Declaration and Initialization. Strings: Reading and Writing Strings, Arrays of Strings, String and Function, Strings and Structure, Standard String Library Functions.          Searching Algorithms: Linear Search, Binary Search. File Handling: Use of files for data input and output, merging and copying files.          Ayurvedic Classification System: Map hierarchical classification of medicinal plants to data structures like arrays and pointers, Shulba Sutras for Spatial Computations: Understanding recursive patterns in Shulba Sutras and their application in functions.  <u>Suggested activities for experiential learning:</u>          1. Mapping Ayurvedic Taxonomy to Data Structures: Represent Ayurvedic classification of herbs using arrays and nested data structures.          2. Function Optimization Project: Implement recursive and iterative functions to compare execution time.          3. Group seminar and Online quiz based on searching algorithm and file handling          4. Vedic Sorting Implementation: Develop a sorting algorithm inspired by Ayurvedic classification techniques.</p>	8



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IV	<p>Data Structure: Basic concepts, Linear and Non-Linear data structures. Algorithm Specifications. Introduction, Recursive algorithms, Data Abstraction, Performance analysis.</p> <p>Linked List: Singly Linked Lists, Operations, Concatenating, circularly linked lists-Operations for Circularly linked lists, Doubly Linked Lists-Operations.</p> <p>Array: Representation of single, two-dimensional arrays, sparse matrices-array and linked representations.</p> <p>Stack: Operations, Array and Linked Implementations, Applications Infix to Postfix Conversion, Postfix Expression Evaluation, Recursion Implementation.</p> <p>Linked List Concept in Indian Knowledge: Ancient Sanskrit texts used linked hierarchical structuring for preserving information (e.g., Vedic oral tradition).</p> <p>Stack Analogy in Nyaya Logic: Indian logical frameworks used last-in first-out (LIFO) reasoning similar to stack operations.</p> <p><u>Suggested activities for experiential learning:</u></p> <ol style="list-style-type: none"> <li>1. Chart Preparation: Prepare charts Linked List, Array &amp; Stack</li> <li>2. Stack Simulation Exercise via Role-Play: Implement a LIFO-based task scheduler.</li> <li>3. Linked List Research Assignment: Compare linked list pointer-based structure with ancient manuscript referencing.</li> <li>4. Students will map historical Guru-Shishya Parampara in the form of a singly linked list (E.g., Vyasa → Shuka → Gaudapada → Govindapada → Adi Shankaracharya) Implement this as a linked list in C/C++, where each node represents a teacher and links to their disciples.</li> </ol>	12
V	<p>Queue: Definition, Operations, Circular Queue-Insertion and Deletion Operations, De queue (Double Ended Queue), Priority Queue Implementation.</p> <p>Trees: Representation of Trees, Binary tree, Properties of Binary Trees, Binary Tree Representations- Array and Linked Representations, Binary Tree Traversals, Threaded Binary Trees.</p> <p>Heap: Definition, Insertion, Deletion.</p> <p>Buddhist Numerical Sorting: Bhaskara II's early classification techniques, Efficient Searching in Ayurveda: Ayurvedic medicinal classification principles resemble hashing and tree-based sorting.</p> <p><u>Suggested activities for experiential learning:</u></p> <ol style="list-style-type: none"> <li>1. Queue-based Ticketing System: Develop a queue system (FIFO) for handling real-world ticket processing.</li> <li>2. Search Algorithm Hackathon: Implement linear, binary, and hashing techniques to solve real-world problems.</li> <li>3. Sorting Race: Students compete to optimize sorting algorithms based on Ayurvedic classification techniques.</li> </ol>	10



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	<p>4. Data Organization Challenge: Create efficient storage models for Ayurveda medicinal records using tree-based structures.</p> <p>5. Comparative Study: Research how Vedic knowledge management compares with modern database indexing.</p>	
VI	<p>Graphs: Graph ADT, Graph Representations, Graph Traversals, Searching.</p> <p>Hashing: Introduction, Hash tables, Hash functions, Overflow Handling.</p> <p>Sorting Methods: Comparison of Sorting Methods, Search Trees - Binary Search Trees, AVL Trees- Definition and Examples.</p> <p>Tree Representation in Ancient India: Genealogy (Gotra System) as an early example of hierarchical tree structures.</p> <p>Graph Connectivity in Temple Design: Principles of temple planning akin to graph traversal.</p> <p><u>Suggested activities for experiential learning:</u></p> <ol style="list-style-type: none"> <li>1. Family Tree Implementation: Use binary trees to model ancient Indian lineage systems.</li> <li>2. Graph Problem Solving: Model Indian temple network connectivity using graph algorithms.</li> <li>3. Heap Data Structure Exploration: Implement heap sorting for priority-based Ayurveda classification.</li> <li>4. Shortest Path Challenge: Use Dijkstra's Algorithm to optimize ancient pilgrimage route planning.</li> <li>5. Graph Theory Workshop: Study the resemblance of temple architecture to graph connectivity and model it using Graph viz/Network X.</li> <li>6. Tree Traversal Experiment: Implement tree traversal to simulate genealogy in Vedic lineage texts.</li> </ol>	10
VII	<p>Indian Contribution to the field: Innovations in India, origin of Julia Programming Language, Indian Engineers who designed new programming languages, open-source languages,</p> <p>Dr. SartajSahni — Computer Scientist - Pioneer of data structures, Murthy's Early Work in Software Development. Julia Programming Language's Indian Origins.</p> <p><u>Suggested activities for experiential learning:</u></p> <ol style="list-style-type: none"> <li>1. Research Presentation: Students present on Indian-origin computer scientists.</li> <li>2. Coding Tribute: Implement an algorithm inspired by SartajSahni's data structure optimizations.</li> <li>3. Innovation Showcase: Identify Indian-origin open-source projects and contribute to them.</li> <li>4. Documentary Screening &amp; Discussion: Screen a documentary on India's tech evolution and discuss its impact.</li> </ol>	2
<p><b>Keywords/Tags:</b> Programming, C++,Data Structures, Expressions, Control, File Handling, Arrays, Stack, Queue, Linked List, Tree, Graph, Structure, Union, Hash, Search, Sort, Algorithm</p>		



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## Part C-Learning Resources

### Text Books, Reference Books, Other resources

#### Suggested Readings:

- Lipschutz: Schaum's outline series Data structures, Tata McGraw-Hill
- Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffman, Pearson, 2015
- E. Balguruswamy, "C++ " TMH Publication ISBN 0-07-462038-X
- Herbertz Shield, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
- R. Lafore, "Object Oriented Programming C++"
- N. Dale and C. Weems, Programming and problem solving with C++: brief edition, Jones & Bartlett Learning.
- Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning.
- Tony Gaddis, Starting Out With Python
- Kenneth A. Lambert, Fundamentals of Python
- Kiparsky, P. (2009). Panini as a Formalist.
- Joseph, G. G. (1991). The Crest of the Peacock: Non-European Roots of Mathematics.
- Bhaskara II (12th Century), Lilavati and Bijaganita.
- Staal, F. (2006). The Science of Language and Logic in India.
- Pingree, D. (1978). Mathematical Astronomy in India.
- Kosambi, D. D. (1948). The Culture and Civilization of Ancient India.
- Sahni, S. (2005). Data Structures, Algorithms, and Applications in C++

#### Suggested online resources:

- <http://www.ndl.gov.in/he document/ekumbh/97>
- <http://www.ndl.gov.in/he document/npTEL/INN1CSaE 9093 NPDSaAuP1226512266>
- <https://archive.nptel.ac.in/courses/106/105/106105171/>
- <https://archive.nptel.ac.in/courses/106/105/106105234/>
- <https://archive.nptel.ac.in/courses/106/101/106101208/>
- <https://archive.nptel.ac.in/courses/106/106/106106133/>
- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=fBYckQKJvP3a/8Vd3L08tQ==>
- <https://nptel.ac.in/courses/106105151>



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<b>Part D-Assessment and Evaluation</b>		
<b>Suggested Continuous Evaluation Methods:</b>		
Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 Marks		
University Exam (UE): 70 Marks		
<b>Internal Assessment:</b>		
Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	Total Marks: 30
<b>External Assessment:</b>		
University Exam Section: Time : 03.00 Hours	<b>Section (A):</b> Objective Type <b>Section (B):</b> Short Questions <b>Section (C):</b> Long Questions	Total Marks: 70



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## PART-A : Introduction

<b>Programme : B.Sc.(CS)</b>		<b>Class : I Year</b>	<b>Semester : II</b>	<b>Session : January - June 2026</b>
<b>Subject : Computer Science</b>			<b>Theory/Practical : Practical</b>	
<b>1.</b>	<b>Course Code</b>	<b>BSCCS - 201 (P)</b>		
<b>2.</b>	<b>Course Title</b>	<b>Programming Methodologies &amp; Data Structures (Using C/C++) (Practical)</b>		
<b>3.</b>	<b>Course Type</b>	<b>Major – II (Core Course)</b>		
<b>4.</b>	<b>Pre-Requisite</b>	To study this course, Mathematics in XII standard is desirable.		
<b>5.</b>	<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To enable students to develop strong problem-solving skills through structured programming principles and efficient use of data structures.</li> <li>2. To build the ability to design, analyze, and implement algorithms using iterative, recursive, and data-driven approaches.</li> <li>3. To select appropriate data structures for real-world applications, evaluate complexity, and create optimized solutions.</li> <li>4. To familiarize students with modern programming practices and recognize the contributions of Indian computer scientists in the field of programming and data structures.</li> </ol>		
<b>6.</b>	<b>Course Outcomes (COs)</b>	<p>On completion of this course, learners will be able to:</p> <ol style="list-style-type: none"> <li>CO1. Develop simple algorithms and flow charts to solve a problem with programming using top-down design principles.</li> <li>CO2. Writing efficient and well-structured computer algorithms/programs.</li> <li>CO3. Formulate iterative solutions and array processing algorithms for problems.</li> <li>CO4. Apply recursive techniques, pointers and searching methods in programming.</li> <li>CO5. Select appropriate data structure suitable to different models;</li> <li>CO6. Implement and know the applications of algorithms for searching and sorting etc.</li> </ol>		



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<b>7.</b>	<b>Expected Job Role / Career Opportunities</b>	<p>Upon successful completion of this course, students will be capable of working in various professional roles such as:</p> <ul style="list-style-type: none"> <li>Software Developer / Software Engineer</li> <li>Programmer Analyst</li> <li>Algorithm and Data Structure Specialist</li> <li>System Analyst / System Designer</li> <li>Application &amp; Web Developer</li> <li>Database Developer</li> <li>Mobile App Developer</li> <li>Technical Support and Maintenance Engineer</li> <li>Research Associate in Computer Science</li> <li>Quality Assurance / Software Testing Engineer</li> <li>Junior Data Engineer / Data Analyst</li> </ul>	
<b>8.</b>	<b>Credit Value</b>	<b>Practical - 2 Credits</b>	
<b>9</b>	<b>Total Marks</b>	<b>Max. Marks: 100</b>	<b>Min. Passing Marks: 35</b>

## PART B: Content of the Course

**No. of Lab Practical (in hours per week): 2 per week**

**Total No. of Lab.: 30 Hrs.**

### Suggestive list of Practical

	<p><b>Given the problem statement, students are required to formulate problem, develop flowchart/algorithm, write code in C++, execute and test it. Students should be given assignments on following :</b></p> <ol style="list-style-type: none"> <li>1. a. To learn elementary techniques involving arithmetic operators and mathematical expressions, appropriate use of selection(if, switch, conditional operators) and control structures</li> <li style="padding-left: 20px;">b. Learn how to use functions and parameter passing in functions, writing recursive programs.</li> <li>2. Write a program to swap the content of two variables.</li> <li>3. Write a program for finding the roots of a Quadratic Equation.</li> <li>4. Write a program to find area of a circle, rectangle, and square using switch case.</li> <li>5. Write a program to check whether a given number is even or odd.</li> </ol>	30 hrs
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6. Write a program to print table of any number.
7. Write a program to print Fibonacci series.
8. Write a program to find factorial of a given number.
9. Write a program to convert decimal (integer) number into equivalent binary number.
10. Write a program to check given string is palindrome or not.
11. Write a program to perform multiplications of two matrices.
12. Write a program to print digits of entered number in reverse order.
13. Write a program to print sum of two matrices.
14. Write a program to print multiplication of two matrices.
15. Write a program to generate even/odd series from 1 to 100.
16. Write a program whether a given number is prime or not.
17. Write a program for call by value and call by reference.
18. Write a program to generate a series  $1+1/1!+2/2!+3/3!+\dots+n/n!$
19. Write a program to create a pyramid structure  
\*  
\*\*  
\*\*\*  
\*\*\*\*
20. Write a program to create a pyramid structure  
1  
12  
123  
1234
21. Write a program to check entered number is Armstrong or not.
22. Write a program for traversing an Array.
23. Write a program to input Numbers, add them and find average.
24. Write a program to find largest element from an array.
25. Write a program for Linear search.
26. Write a program for Binary search.
27. Write a program for Bubble sort.
28. Write a program for Selection sort.



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## PARTC: Learning Resources

### Text books ,Reference Books, Other Resources

#### Suggested Readings:

- Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Pearson, 2015
- E. Balguruswamy, "C++" TMH Publication ISBN 0-07-462038-X
- Herbertz Shield, "C++ The Complete Reference" TMH Publication ISBN 0-07-463880-7
- R. Lafore, "Object Oriented Programming C++"
- N. Dale and C. Weems, Programming and problem solving with C++: brief edition, Jones & Bartlett Learning.
- Adam Drozdek, "Data Structures and Algorithms in C++", Third Edition, Cengage Learning.
- Sartaj Sahani, Data Structures, Algorithms and Applications with C++, McGraw Hill.
- Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
- D.S. Malik, Data Structure using C++, Second edition, C language Learning.
- M.A. Weiss, Data structures and Algorithm Analysis in C, 2nd edition, Pearson.
- Lipschutz: Schaum's outline series Data structures, Tata McGraw-Hill

#### Suggestive digital platform web links:

<https://www.youtube.com/watch?v=BCIS40yzssA>  
<https://www.youtube.com/watch?v=vLnPwxZdW4Y&vl=en>  
<https://www.youtube.com/watch?v=UmmI ZQ5ItZw>  
<https://nptel.ac.in/courses/106/106/106106127/>

#### Suggested equivalent online courses

<https://nptel.ac.in/courses/106/105/106105151/>  
<https://nptel.ac.in/courses/106/105/106105171/>



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<b>PART D: Assessment and Evaluation</b>			
<b><u>Internal Assessment</u></b>	<b><u>Marks</u></b>	<b><u>External Assessment</u></b>	<b><u>Marks</u></b>
Class Interaction/Quiz	Nil	Viva voce on practical(20 Marks)	100
Attendance		Practical Record File (20 marks)	
Assignments (Charts/ Model/Seminar/ Technology Dissemination/Excursion/ Lab Visits /Industrial visit)		Table Work / Exercise Assigned (60 marks)	
<b>Total Marks :100</b>			



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<b>Programme : B.Sc.(CS)    Class : I Year    Semester : II    Session : January – June 2026</b>		
<b>Subject :                      Computer Science</b>		<b>Theory/Practical : Theory</b>
<b>1.</b>	<b>Course Code</b>	<b>BSCCS – 202 (T)</b>
<b>2.</b>	<b>Course Title</b>	<b>Operating System &amp; Office Tools (Theory)</b>
<b>3.</b>	<b>Course Type</b>	<b>Major – III (Core Course)</b>
<b>4.</b>	<b>Pre-Requisite</b>	To study this course, Mathematics in XII standard is desirable.
<b>5.</b>	<b>Course Objectives</b>	<ol style="list-style-type: none"><li>1. To provide learners with a foundational understanding of operating system concepts, functions, and architectures.</li><li>2. To develop analytical abilities related to process management, scheduling, concurrency, and memory management.</li><li>3. To build a clear understanding of file systems, I/O management, security mechanisms, and virtualization techniques.</li><li>4. To enable learners to gain proficiency in modern office productivity tools, including word processing, spreadsheets, presentations, database management, and collaboration platforms.</li><li>5. To familiarize learners with India's contributions to computing, knowledge structuring, and resource management methodologies.</li></ol>
<b>6.</b>	<b>Course Outcomes (COs)</b>	<p>On completion of this course, learners will be able to:</p> <ul style="list-style-type: none"><li>CO1. Understand the fundamental concepts or operating systems, their functions ,and architectures;</li><li>CO2. Analyze process management, scheduling, concurrency, and memory management techniques;</li><li>CO3. Understand the file systems, I/O management, security, and virtualization;</li><li>CO4. Develop proficiency in state-of-the-art office productivity tools ,including word processing, spreadsheets, presentations, database management, and collaboration tools;</li><li>CO5. Explain India's contributions towards computing, knowledge structuring, and resource management techniques.</li></ul>



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7.	<b>Expected Job Role / Career Opportunities</b>	<ul style="list-style-type: none"><li>• System Administrator</li><li>• IT Helpdesk Technician</li><li>• Operating System Analyst (Entry Level)</li><li>• Network Support Technician</li><li>• Cloud Support Associate</li><li>• Office IT Executive</li><li>• Productivity Tools Specialist / Documentation Executive</li></ul>
8.	<b>Credit Value</b>	<b>Theory : 4 Credits</b>
9.	<b>Total Marks</b>	<b>Max.Marks:100</b> <b>Min. Passing Marks:35</b>



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## PART B: Content of the Course

No. of Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures: 60 Hrs.

Unit	Topics	No. of Lectures
I	<p>Introduction to Operating Systems: Definition, Functions, Evolution, Types (Batch, Multiprogramming, Time- Sharing, Distributed, Real-Time, Embedded). Resource allocation concepts in Indian Philosophy. –Pancha Kosha theory - layered abstraction akin to OS design, Manuscript storage in ancient Indian libraries (Takshashila &amp; Nalanda) as an analogy for memory management.</p> <p>Suggested activities for experiential Learning</p> <ol style="list-style-type: none"><li>1. Compare modern OS resource allocation techniques with the layered structure of Pancha Kosha.</li><li>2. Group Discussion &amp; Concept Mapping: Explore how ancient manuscript storage systems parallel modern memory management.</li><li>3. Simulation exercise.-Develop a simulation that modern resource allocation algorithms (e.g., CPU scheduling) in an OS environment.</li><li>4. Conceptual Flowchart Development: Create flowcharts that map the evolution of OS design, linking abstract layers to practical resource management.</li></ol>	8
II	<p>Process Management: Process Concept, Process Scheduling (FCFS, SJF, Round Robin, Priority Scheduling), Threads, Inter-process Communication (IPC).</p> <p>Task scheduling in Vedic rituals: Yagna sequences similar to scheduling algorithms, Efficient computation models in Indian astronomy (Aryabhata's planetary motion calculations).</p> <p>Suggested Activities for experiential Learning:</p> <ol style="list-style-type: none"><li>1. Simulation Modeling: Develop a simulation of process scheduling (e.g., FCFS, SJF) and compare its performance with the sequential order observed in Vedic rituals.</li><li>2. Real-life Analogy: Ask students to map everyday situations (e.g., waiting in a queue, dividing tasks among teammates) to process scheduling concepts.</li><li>3. Role-Playing Exercise (Core CS): Organize a role-play where students act out process scheduling to understand priorities and time-sharing.</li><li>4. Thread Race Game- Create a hands-on game where students simulate threads competing for CPU time. Use physical tokens or cards to represent tasks and resources.</li></ol>	8



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<b>III</b>	<p>Concurrency &amp; Synchronization: Process Synchronization, Critical Sections, Deadlocks (Prevention, Avoidance, Detection), Semaphores, CPU Scheduling.</p> <p>Parallel execution concepts in Indian astronomical texts (e.g., Surya Siddhanta) compared to modern concurrent processing.</p> <p>Suggested Activities for experiential Learning:</p> <ol style="list-style-type: none"><li>1. Interactive Simulation. - Build a simulation to model concurrent process execution and explore synchronization techniques (e.g., semaphores, monitors).</li><li>2. Hands-On Lab.- Design and test synchronization protocols to resolve common issues like race conditions and deadlocks.</li><li>3. Role-Playing Activity: Have students simulate process synchronization, with roles assigned as processes and synchronization tools.</li><li>4. Organize a debate in which students argue the concept of "parallelism" in the Surya Siddhartha versus modern computational models.</li><li>5. Group Discussion: Discuss how tasks can be divided and executed simultaneously to reduce overall execution time.</li></ol>	<b>8</b>
<b>IV</b>	<p>Memory Management: Memory Hierarchy, Virtual Memory, Paging, Segmentation, Fragmentation, Thrashing.</p> <p>Indexing &amp; storage techniques in ancient Indian texts (Rigveda's indexing method similar to hierarchical memory management).</p> <p>Suggested Activities for experiential Learning:</p> <ol style="list-style-type: none"><li>1. Simulation Project: Develop a simulator for virtual memory management and paging, drawing analogies with ancient hierarchical indexing.</li><li>2. Comparative Research Assignment: Investigate and present on the similarities between ancient manuscript organization and modern cache memory systems.</li><li>3. Visualization Workshop: Design flowcharts or diagrams that illustrate memory allocation and fragmentation concepts.</li><li>4. Hands-On Implementation: Implement a memory management algorithm to study fragmentation and allocation strategies in a simulated OS environment.</li></ol>	<b>8</b>



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<b>V</b>	<p>File Systems &amp; I/O Management: File Organization, Allocation Methods (Contiguous, Linked, Indexed), Directory Structure, Disk Scheduling (FCFS, SSTF, SCAN, LOOK).</p> <p>Knowledge documentation in Indian scriptures (Palm-leaf manuscripts stored using structured indexing).</p> <p>Suggested activities for experiential learning:</p> <ol style="list-style-type: none"><li>1. File System Design Project: Design file system architecture inspired by the organized storage of ancient manuscripts.</li><li>2. Lab Exercise: Simulate different file allocation methods (contiguous, linked, indexed) using available tools.</li><li>3. Group Project: Develop a directory management system incorporating modern OS file system concepts.</li><li>4. Case Study Discussion: Analyze real-world file system challenges and propose solutions, integrating both historical insights and modern techniques.</li></ol>	<b>8</b>
<b>VI</b>	<p>Office Productivity Tools: Word Processing, Spreadsheets, Presentations, Database Management, Email &amp; Collaboration Tools.</p> <p>Emphasizing latest versions of widely used office productivity suites such as MS Office 365 (with AI support), Google Workspace, Libre Office, and any emerging tools. The focus will be on adaptability to evolving digital technologies.</p> <p>Suggested activities for experiential learning:</p> <ol style="list-style-type: none"><li>1. Tool Comparison Workshop: Compare different office productivity suites (e.g., document editors, spreadsheets, presentations) based on functionality and usability.</li><li>2. Integrated Project: Develop a comprehensive project that requires the creation and management of documents, spreadsheets, and presentations to simulate real-world business scenarios.</li><li>3. Collaborative Simulation: Organize a virtual group exercise using modern collaboration tools to solve a practical problem.</li><li>4. Expert Session: Invite an industry professional to demonstrate advanced features and discuss emerging trends in digital productivity.</li></ol>	<b>8</b>



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<b>VII</b>	<p>Security &amp; Virtualization: Basics of Computer Security, User Authentication, Access Control, Cloud Computing, Virtual Machines, Containers.</p> <p>Ancient Indian encryption techniques (Kautilya's Arthashastra on cryptography), Role of security in knowledge preservation (e.g., coded messages in ancient war strategies).</p> <p>Suggested activities for experiential learning:</p> <ol style="list-style-type: none"><li>1. Encryption Lab: Implement basic encryption and decryption algorithms inspired by ancient techniques and compare with modern methods.</li><li>2. Virtualization Simulation: Develop a simulation to understand virtualization concepts and the isolation of virtual environments.</li><li>3. Security Policy Workshop: Draft a security policy for a hypothetical organization, integrating both modern authentication protocols and historical secure communication practices.</li><li>4. Case Study Analysis: Examine historical instances of secure communication and relate them to contemporary security challenges.</li></ol>	<b>8</b>
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## Part C-Learning Resources

### Text Books, Reference Books, Other resources

#### Suggested Readings.-

- Silberschatz, Galvin, Gagne: Operating System Concepts, Wiley.
- William Stallings : Operating Systems : Internals & Design Principles, Pearson.
- Andrew S. Tanenbaum: Modern Operating Systems, Pearson.
- Rajaraman : Fundamentals of Computers, PHI Learning.
- ITL Education: Introduction to Information Technology, Pearson.
- S.(2004). Ancient Indian Knowledge Systems and Their Relevance to Modern Technology.
- Ghosh, A.(2001). Indian Philosophy and Organizational Systems.
- Nair, A.(2015). Indian Innovators in Computing.
- Rao, S.(2013). Technological Contributions from India.
- Mehta, P.(2006). Cryptography in Arthashastra.
- Desai, V.(2012). Ancient Security Practices and Modern Cryptography.
- Banejee, S.(2002). Documentation Systems in Ancient India.
- Singh, R.(2008). File Systems: An Indian Historical Perspective.
- Kumar, D.(2007). Ancient Indexing Methods and Modern Memory Systems.
- Jain, M.(2003). Memory and Manuscripts : An Indian Perspective.
- Reddy, N.(2010). Parallel is min Ancient Indian Astronomy.
- Menon, K.(2008). Concurrency Concepts in Historical Context.
- Gupta, P.(1999). Aryabhata's Contributions to Astronomy and Computing.
- Sharma, R.(2005). Ancient Scheduling Techniques in Indian Rituals.

#### Suggestive digital platforms weblinks :

- NPTEL Course: Operating System Principles — NPTEL Link
- Office Tools (Latest MS Office 365, AI Support)
- <https://nptel.ac.in/courses/106106144>
- <https://archive.nptel.ac.in/courses/106/10S/106105214/>
- <https://cpep.inflibnct.ac.in/Home/ViewSubicct?catid=fBYckC,IXJvP3a/8Vd3L08tCI==>



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## Part D-Assessment and Evaluation

### Suggested Continuous Evaluation Methods:

Maximum Marks: 100  
Continuous Comprehensive Evaluation (CCE): 30 Marks  
University Exam (UE): 70 Marks

### Internal Assessment:

Continuous Comprehensive  
Evaluation (CCE)

Class Test Assignment/Presentation

Total Marks: 30

### External Assessment:

University Exam Section:  
Time : 03.00 Hours

**Section (A):** Objective Type  
**Section (B):** Short Questions  
**Section (C):** Long Questions

Total Marks: 70



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<b>PART-A : Introduction</b>		
<b>Programme : B.Sc.(CS)</b>	<b>Class : I Year</b>	<b>Semester : II</b>
<b>Session : January - June 2026</b>		
<b>Subject :</b>	<b>Computer Science</b>	<b>Theory/Practical : Practical</b>
<b>1.</b>	<b>Course Code</b>	<b>BSCCS – 202 (P)</b>
<b>2.</b>	<b>Course Title</b>	<b>Operating System &amp; Office Tools (Practical)</b>
<b>3.</b>	<b>Course Type</b>	<b>Major – III (Core Course)</b>
<b>4.</b>	<b>Pre-Requisite</b>	To study this course, Mathematics in XII standard is desirable.
<b>5.</b>	<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To enable learners to implement and simulate core operating system mechanisms such as process scheduling, disk scheduling, and memory management.</li> <li>2. To develop the ability to detect and analyze deadlocks using appropriate modeling techniques.</li> <li>3. To build practical skills in file handling through Linux commands and shell scripting.</li> <li>4. To enhance learners' proficiency in formatting and managing text using various word-processing tools.</li> <li>5. To develop competency in creating and analyzing spreadsheets using formulas, functions, and pivot tables.</li> <li>6. To train learners in creating, organizing, and manipulating data using database management tools.</li> <li>7. To equip learners with the ability to design effective presentations using AI-enabled tools in an efficient and creative manner.</li> <li>8. To prepare learners to manage and conduct online meetings through platforms such as Google Meet, MS Teams, and Zoom.</li> </ol>
<b>6.</b>	<b>Course Outcomes (COs)</b>	<p>On completion of this course, learners will be able to:</p> <p>CO1. Perform the simulation for process scheduling, disk-scheduling, memory management techniques.</p> <p>CO2. Perform the dead-lock detection using modeling.</p> <p>CO3. Perform the file-handling using Linux commands and shell scripting.</p> <p>CO4. Perform the formatting of text on various word processing tools.</p>



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		CO5. Create spread sheet using formula and pivot tables. CO6. Create and manipulate the data using database tools. CO7. Create presentations using AI tools in quick and smart way. CO8. Manage online-meetings through Google meet, MS-teams, Zoom etc. applications.	
7.	<b>Expected Job Role/Career Opportunities</b>	<ul style="list-style-type: none"><li>• System Administrator (Entry-Level)</li><li>• Linux Operator / Linux Support Technician</li><li>• IT Support Engineer / Technical Support Executive</li><li>• Office Productivity Specialist</li><li>• Data Entry &amp; Data Management Executive</li><li>• Digital Office Executive</li><li>• Virtual Meeting Coordinator / Online Events Assistant</li></ul>	
8.	<b>Credit Value</b>	<b>Practical - 2 Credits</b>	
9.	<b>Total Marks</b>	<b>Max.Marks:100</b>	<b>Min .Passing Marks:35</b>



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<b>PART B:Content of the Course(Practical)</b>	
<b>No. of Lab Practical (in hours per week): 2 per week</b>	
<b>Total No. of Lab.: 30 Hrs.</b>	
<b>Suggestive list of Practical</b>	<b>No. of Labs.</b>
<p>1- Office Tools:</p> <p><b>1 Word Processing Tools:</b> Document formatting, referencing, macros (Using latest versions of MS Word, Google Docs, LibreOffice).</p> <ul style="list-style-type: none"> <li>• Create a document and apply different Editing options.</li> <li>• Create Banner for your college.</li> <li>• Design a Greeting Card using Word Art for different festivals.</li> <li>• Design your Bio data and use page borders and shading.</li> <li>• Create a document and insert header and footer, page title, date, time, apply various page formatting features etc.</li> <li>• Implement Mail Merge.</li> <li>• Insert a table into a document and try different formatting options for the table.</li> </ul> <p><b>2 Spreadsheet Tools:</b> Advanced formulas, data visualization, pivot tables (Using latest Excel, Google Sheets).</p> <ul style="list-style-type: none"> <li>• Design your class Time Table.</li> <li>• Prepare a Mark Sheet of your class result.</li> <li>• Prepare a Salary Slip of an employee of an organization.</li> <li>• Prepare a bar chart &amp; pie chart for analysis of Election Results.</li> <li>• Prepare a generic Bill of a Super Market.</li> <li>• Work on the following exercises on a Workbook:</li> <li>• Copy an existing Sheet</li> <li>• Rename the old Sheet</li> <li>• Insert a new Sheet into an existing Workbook</li> <li>• Delete the renamed Sheet.</li> <li>• Prepare an Attendance sheet of 10 students for any 6 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student &amp; average of attendance.</li> <li>• Create a worksheet of Students list of any 4 faculties and perform following database functions on it.               <ul style="list-style-type: none"> <li>○ Sort data by Name</li> <li>○ Filter data by Class</li> <li>○ Subtotal of no. of students by Class.</li> </ul> </li> </ul>	30 hrs



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**3 Presentation Tools:** AI-assisted slide design, animation, transitions (Using PowerPoint, Google Slides).

- Design a presentation of your institute using auto content wizard, design template and blank presentation.
- Design a presentation illustrating insertion of pictures, Word Art and ClipArt.
- Design a presentation, learn how to save it in different formats, copying and opening an existing presentation.
- Design a presentation illustrating insertion of movie, animation and sound.
- Illustrate use of custom animation and slide transition (using different effects).
- Design a presentation using charts and tables of the marks obtained in class.



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## Part C-Learning Resources

### Text Books, Reference Books, Other resources

#### Suggested Readings.-

1. Silber schatz ,Galvin,Gagne: Operating System Concepts,Wiley.
2. William Stallings: Operating Systems:Internals & Design Principles ,Pearson.
3. Andrew S.Tanenbaum: Modem Operating Systems ,Pearson.
4. Rajaraman: Fundamentals of Computers, PHI Learning.
5. ITL Education : Introduction to Information Technology, Pearson.

### Suggestive digital platforms weblinks:

#### Suggested Digital Learning Resources.

- NPTEL Course: Operating System Principles
- YouTube Lectures:

Operating System Fundamentals

Office **Tools** (Latest MS Office 365, AI Support)

## PART D: Assessment and Evaluation

<u>Internal Assessment</u>	<u>Marks</u>	<u>External Assessment</u>	<u>Marks</u>
Class Interaction/Quiz	Nil	Viva voce on practical(20 Marks)	100
Attendance		Practical Record File (20 marks)	
Assignments (Charts/ Model/Seminar/ Technology Dissemination/Excursion/ Lab Visits /Industrial visit)		Table Work / Exercise Assigned (60 marks)	
<b>Total Marks :100</b>			



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<b>PART-A : Introduction</b>		
<b>Programme : B.Sc.(CS) Class : I Year Semester : II Session : January - June 2026</b>		
<b>Subject: Computer Science</b>		<b>Theory/Practical : Theory</b>
<b>1.</b>	<b>Course Code</b>	<b>BSCCS – 203</b>
<b>2.</b>	<b>Course Title</b>	<b>Ordinary Differential Equations</b>
<b>3.</b>	<b>Course Type</b>	<b>Minor – II</b>
<b>4.</b>	<b>Pre-Requisite</b>	To study this course, Mathematics in XII standard is desirable
<b>5.</b>	<b>Course Objectives</b>	<ol style="list-style-type: none"><li>1. To explore the historical development and significance of differential equations in mathematics and applied sciences.</li><li>2. To attain a clear understanding of first-order and higher-order differential equations along with their solution techniques.</li><li>3. To study homogeneous differential equations and analyze their properties and applications.</li><li>4. To understand the construction and interpretation of mathematical models involving differential equations and their real-world uses.</li></ol>
<b>6.</b>	<b>Course Outcomes (COs)</b>	<p>On completing this course, Learner will be able to:</p> <p>CO1. Identify and classify differential equations based on order, degree, and type, distinguishing between linear and nonlinear forms.</p> <p>CO2. Recognize ordinary differential equations in various contexts and formulate appropriate differential equations for given mathematical or real-life situations.</p> <p>CO3. Apply analytical methods to solve ordinary differential equations and use them to model practical problems across physics, biology, engineering, and economics.</p> <p>CO4. Develop and analyze mathematical models of diverse systems—such as mechanical, biological, and electrical systems—using differential equations as a foundational tool.</p>



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<b>7.</b>	<b>Expected Job Role/Career Opportunities</b>	<ul style="list-style-type: none"> <li>Data Analyst</li> <li>Quantitative Analyst</li> <li>Research Scientist</li> <li>Mathematical Modeler</li> <li>Simulation Engineer</li> <li>Software Developer (Modeling/Computation)</li> <li>Financial Analyst / Economic Modeler</li> </ul>	
<b>8.</b>	<b>Credit Value</b>	<b>Theory: 4 Credit</b>	
<b>9.</b>	<b>Total Marks</b>	<b>Max.Marks:100</b>	<b>Min. Passing Marks:35</b>

<b>PART B: Content of the Course</b>		
<b>No. of Lectures (in hours per week): 2 Hrs. per week</b>		
<b>Total No. of Lectures: 60 Hrs.</b>		
Unit	Topics	No. of Lectures
I	<b>Indian Knowledge System:</b> 1.1 Historical Background of Differential Equations 1.2 Contribution of Indian Mathematicians in Differential Equations: 1.2.1 Aryabhata Bhaskracharya, Madhava	5
II	<b>Differential Equations-I:</b> 2.1 Linear differential equations 2.1.1 Linear equation 2.1.2 Equations reducible to the linear form 2.1.3 Change of variables 2.2 Exact differential equations 2.3 First order and higher degree differential equations 2.3.1 Equations solvable for x,y and p 2.3.2 Equations homogenous in x and y, Clairaut's equation Singular solutions	20
IV	<b>Differential Equations-III:</b> 4.1 Method of variation of parameters Ordinary Simultaneous Differential Equation of First Order.	10
Case Study	<b>Industrial Applications:</b> Applications of Differential equations to solve the problems related to Industries, Business and Economics.	5



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## Part C-Learning Resources

### Text Books, Reference Books, Other resources

#### Suggested Readings:

##### Text Books:

1. Gorakh Prasad: Integral Calculus, Pothishala Private Ltd., Allahabad, 2015.
2. M. D. Raisinghania: Ordinary and Partial Differential Equations, S Chand & Co Ltd, 2017.
3. Gerard G. Emch, R. Sridharan and M. D. Srinivas: Contributions to the History of Indian Mathematics. Hindustan Book Agency, Vol. 3, 2005.
4. Bharati Krsna Tirthaji Maharaja, "Vedic Mathematics", Motilal Banarasidas Publisher, Delhi, 1994.
5. Udayan S. Patankar & Sunil S. Patankar: Elements of Vedic Mathematics, TTU Press, 2018.
6. Enrique Fernández-Cara: Ordinary Differential Equations and Applications, World Scientific, 2024.

##### Reference Books:

1. G.F. Simmons: Differential Equations, Tata McGraw Hill, 1972.
2. E. A. Codrington: An Introduction to ordinary differential Equation, Prentice Hall of India, 1961.
3. D.A. Murray: Introductory Course in Differential Equations, Orient Longman (India) 1967.
4. H.T. H. Piaggio: Elementary Treatise on Differential Equations and their Application, C.B.S. Publisher & Distributors, Delhi, 1985.
5. Bibhutibhusan Datta and Avadhesh Narayan Singh: History of Hindu Mathematics, Asia Publishing House, 1962.
6. Balachandra Rao: Differential Equations with Applications, Universities Press, 1996.

##### Suggestive digital platforms weblinks:

1. \ <https://epgp.inflibnet.ac.in>
2. <https://freevideolectures.com/university/iit-roorkee>
3. <https://www.eshiksha.mp.gov.in/mpdhe>

##### Suggested Equivalent Online Courses:

1. <https://nptel.ac.in/courses/111106146/>
2. <https://nptel.ac.in/courses/122102004/L02>
3. <https://nptel.ac.in/courses/111/101/111101080>



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## Part D-Assessment and Evaluation

<b>Suggested Continuous Evaluation Methods:</b>		
Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 Marks		
University Exam (UE): 70 Marks		
<b>Internal Assessment:</b>		
Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	Total Marks: 30
<b>External Assessment:</b>		
University Exam Section: Time : 03.00 Hours	<b>Section (A):</b> Objective Type <b>Section (B):</b> Short Questions <b>Section (C):</b> Long Questions	Total Marks: 70



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<b>PART-A : Introduction</b>		
<b>Programme : B.Sc.(CS)      Class : I Year      Semester : II      Session : January - June 2026</b>		
<b>Subject : Computer Science</b>		<b>Theory/Practical : Theory</b>
<b>1.</b>	<b>Course Code</b>	<b>BSCCS – 203 (T)</b>
<b>2.</b>	<b>Course Title</b>	<b>Thermodynamics</b>
<b>3.</b>	<b>Course Type</b>	<b>Minor - II</b>
<b>4.</b>	<b>Pre-Requisite</b>	To study this course, a student must have had the subject Physics in 12 <sup>th</sup> Class
<b>5.</b>	<b>Course Objectives</b>	<ol style="list-style-type: none"><li>1. To understand the historical development of thermodynamics, with a focus on Indian knowledge systems, contributions from Satyendra Nath Bose and Meghna d Saha.</li><li>2. To identify the key characteristics and significance of thermal power plants located in Madhya Pradesh.</li><li>3. To learn working of a heat engine to transform heat into work.</li><li>4. To apply the principles of calorimeter and Newton's Law of cooling in practical scenarios.</li></ol>
<b>6.</b>	<b>Course Outcomes (COs)</b>	<p>On completion of this course, learner will be able to:</p> <p>CO1.Outline the historical progression of thermodynamics, specifically recognizing the foundational ideas present in Indian knowledge systems and the key contributions of modern Indian physicists Satyendra Nath Bose and Meghnad Saha.</p> <p>CO2.Identify the key operational characteristics and the regional significance of thermal power plants located within the state of Madhya Pradesh Students will comprehend the working principles of a heat engine and the mechanisms by which thermal energy is systematically transformed into mechanical or electrical work.</p> <p>CO3.Apply the theoretical principles of calorimeter (the measurement of heat transfer) and Newton's law of cooling (the rate of heat loss) to solve problems in practical, real-world scenarios</p>



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7.	<b>Expected job roles /carrier opportunities</b>	A strong understanding and practical experience in thermodynamics open up diverse career opportunities in 1. Mechanical 2. Chemical 3. Aerospace 4. Research and Development (R&D) Engineer/Scientist 5. Piping Designer 6. Simulation These roles involve designing, analyzing, and optimizing systems that manage heat and energy transfer in a wide array of industries.	
8.	<b>Credit Value</b>	<b>Theory:3</b>	
9.	<b>Total Marks</b>	<b>Max Marks: 100</b>	<b>Min. Passing Marks:35</b>

**PART B: Content of the Course (Theory)**



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No. of Lectures (in hours per week): 2 Hrs. per week		
Total No. of Lectures: 60 Hrs.		
Unit	Topics	No. of Lectures
Unit I	<p><b>Historical background &amp; Kinetic theory</b></p> <ol style="list-style-type: none"><li>1. Historical context of thermodynamics in Indian knowledge systems, Contributions of Satyendra Nath Bose to statistical physics. Biography and significant contributions of Meghnad Saha.</li><li>2. Thermal Power Plants Located in Madhya Pradesh and Their Key Characteristics.</li><li>3. Kinetic Theory of gases, Maxwell's speed distribution, Mean free path. Elementary treatment of transport phenomena,</li><li>4. Viscous flow and Thermal conduction in gases. Real gases, Andrew's curves, Equation of state.</li><li>5. Virial coefficients, Vander Waals equation, Critical constants.</li></ol> <p><b>Activities:</b></p> <ol style="list-style-type: none"><li>1. Visit thermal power plant (if possible) / make model of thermal power plant / make chart of thermal power plant.</li><li>2. To compare the viscosity of different fluids by observing how they flow down an inclined surface.</li></ol> <p><b>Keywords/Tags:</b> Thermodynamics. Thermal Power Plants.</p>	09
Unit II	<p><b>Laws of thermodynamics</b></p> <ol style="list-style-type: none"><li>1. Thermo dynamical system, Thermodynamic equilibrium, Zeroth law of thermodynamics. The concept of path function and point function, First law of thermodynamics, Reversible and irreversible processes</li><li>2. Heat engine and its efficiency, Carnot's engine and its efficiency. Carnot's theorem, Otto engine and diesel engine.</li><li>3. Second law of thermodynamics, Statement of Kelvin-Planck and Clapeyron, Third law of thermodynamics.</li></ol> <p><b>Activities:</b></p> <ol style="list-style-type: none"><li>1. Compare Otto and Diesel engines via model and chart.</li><li>2. Illustrate the Second Law of Thermodynamics with a chart on entropy, heat flow, and applications.</li></ol> <p><b>Keywords/Tags:</b> Thermodynamic equilibrium. Reversible and irreversible processes. Heat engine</p>	15



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<b>Unit III</b>	<p><b>Entropy</b></p> <ol style="list-style-type: none"><li>1. Concept of entropy, Clausius theorem, Entropy change in adiabatic reversible process, Entropy as point function, Change in entropy of universe in reversible and irreversible processes.</li><li>2. Principle of increase of entropy. Entropy and unavailable energy, Entropy of ideal gases, Entropy as a thermodynamic variable, T-S diagram.</li></ol> <p><b>Activities:</b></p> <ol style="list-style-type: none"><li>1. Ask students to observe the example of reversible and irreversible process in daily life.</li><li>2. Ask students to present the 'T-S Diagram using the graph.</li></ol> <p><b>Keywords/Tags:</b> Entropy, T-S diagram.</p>	15
<b>Unit IV</b>	<p><b>Thermodynamic potentials</b></p> <ol style="list-style-type: none"><li>1. Thermodynamic functions: Internal energy. Enthalpy, Helmholtz and Gibb's free energy. Maxwell's thermodynamical equations and their applications.</li><li>2. TdS equations, Derivation of expressions of <math>C_p-C_v</math> for ideal and real gases, derivation of the expression <math>E_s/E_T = C_p/C_v</math> Energy and heat capacity equations, Clapeyron equations and its applications (sublimation, vaporization).</li></ol> <p><b>Activities:</b></p> <ol style="list-style-type: none"><li>1. Assign students to create a flowchart or diagram showing the relationships between internal energy, enthalpy, Helmholtz free energy, and Gibb's free energy.</li><li>2. Provide numerical problems where students calculate <math>C_p-C_v</math> for ideal gases and compare results with real gases.</li></ol> <p><b>Keywords/Tags:</b> Thermodynamic potential, Internal energy, Enthalpy, Helmholtz free energy, Gibb's free energy.</p>	11



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<b>Unit V</b>	<b>Thermometry, Calorimetry and Radiation</b> 1. Types of thermometers, Platinum Resistance Thermometer, Seebeck effect, Peltier effect, Absolute scale of temperature. Calorimetry, Newton's law of cooling, calorific value of fuels, coefficient of thermal conductivity, Searle's method, Lee's method for badconductors. 2. Blackbody Radiation, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum theory of radiation.	10
	<b>Activities:</b> 1. Study temperature management techniques used in ancient Indian architecture, such as cooling in public buildings, stepwells, and havelis, 2. Study Scientific significance of Rituals and Yajnas. <b>Keywords/Tags:</b> Seebeck effect, Peltier effect, Radiations.	

## Part C-Learning Resources

### Text Books, Reference Books, Other resources

1. Bhaskara II, "Siddhanta Shiromani", (1150 CE).
2. Dongre N. G., Nene S. G., "Physics in Ancient India", National Book Trust, India.
3. Saha, M. N., & Srivastava, B. N. (1958). Treatise on Heat. Indian Press.
4. Zemansky M. W. & Dittman R., "Heat and Thermodynamics", Tata McGraw-Hill.
5. Sears and Salinger, "Thermodynamics, Kinetic Theory & Statistical Thermodynamics", Narosa.
6. Garg S. C. & Ghosh C. K., "Thermal Physics", Tata McGraw-Hill.
7. Subrahmanyam N., Brij Lal, Hemne P.S., " Heat Thermodynamics and statistical", S. Chand, 2012.

### Suggestive digital platforms weblinks:

1. <https://www.eshiksha.mp.gov.in/mpdhe/> Learning Management System, Department of higher education, Government of Madhya Pradesh (M.P.).
2. <https://www.edx.org/course/thermodynamics/> Thermodynamics course.



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## Part D-Assessment and Evaluation

### Suggested Continuous Evaluation Methods:

Maximum Marks: 100  
Continuous Comprehensive Evaluation (CCE): 30 Marks  
University Exam (UE): 70 Marks

#### Internal Assessment:

Continuous Comprehensive  
Evaluation (CCE)

Class Test Assignment/Presentation

Total Marks: 30

#### External Assessment:

University Exam Section:  
Time : 03.00 Hours

**Section (A):** Objective Type

**Section (B):** Short Questions

**Section (C):** Long Questions

Total Marks: 70





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9.	<b>Total Marks</b>	<b>Max. Marks: 100</b>	<b>Min. Passing Marks:35</b>
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<b>PART B: Content of the Course</b>		
<b>No. of Lectures (in hours per week): 1 Hr. per week</b>		
<b>Total No. of Lectures: 15 Hrs.</b>		
<b>Sr. No.</b>	<b>List of experiments</b>	<b>No. of Practical</b>
1.	Determination of the mechanical equivalent of heat by Callender & Barne's method	15 Hrs.
2.	Determination of Efficiency of electrical Kettle with variable voltages.	
3.	Determination of thermal conductivity of a bad conductor by Lee's disc method.	
4.	Verification of Newton's law of cooling	
5.	Determination of Ratio of specific heat of air by Clement-Desorme's method)	
6.	Determination of Specific heat of a liquid using Newton's law of cooling.	
7.	Determination of Thermal conductivity of a metal by Searl's method.	
8.	Determination of Thermal conductivity of rubber using calorimeter.	
9.	Determination of Mechanical equivalent of heat (J) using Joule calorimeter.	
10.	Determination of Temperature coefficient of resistance by Carey-Foster bridge.	



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## Part C-Learning Resources

### Text Books, Reference Books, Other resources

#### Suggested Reading

1. Prakash I. & Ramakrishna, "A Text Book of Practical Physics", Kitab Mahal, 2011, 11/e.
2. Squires G. L., "Practical Physics", Cambridge University Press, 2015, 4/e.
3. Flint B. L. and Worsnop H. T., "Advanced Practical Physics for students", Asia Publishing House, 1971.
4. Chattopadhyay D. & Rakshit P. C., "An Advanced Course in Practical Physics", New Central Book Agency.

#### Suggestive digital platforms weblinks:

1. <https://www.vlab.co.in/broad-area-physical-sciences>
2. <https://storage.googleapis.com/uniquecourses/online.html>

## PART D: Assessment and Evaluation

<u>Internal Assessment</u>	<u>Marks</u>	<u>External Assessment</u>	<u>Marks</u>
Class Interaction/Quiz	Nil	Viva voce on practical(20 Marks)	100
Attendance		Practical Record File (20 marks)	
Assignments (Charts/ Model/Seminar/ Technology Dissemination/Excursion/ Lab Visits /Industrial visit)		Table Work / Exercise Assigned (60 marks)	
<b>Total Marks :100</b>			



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<b>PART-A : Introduction</b>		
<b>Programme : B.Sc./BCA/BBA /BBA FT/BBA HA</b>		
<b>Class : I Year</b>	<b>Semester : II</b>	<b>Session : January - June 2026</b>
<b>Subject : Ability Enhancement Course</b>		<b>Theory / Practical: Theory</b>
1.	<b>Course Code</b>	AEC – 201
2.	<b>Course Title</b>	English Language and Indian Culture
3.	<b>Course Type</b>	Ability Enhancement Course
4.	<b>Pre-Requisite</b>	Not Required
5.	<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To imbibe values which make students aware of national heritage and making them responsible citizens.</li> <li>2. To critically read texts to identify main ideas, infer meanings, and assess the author's purpose.</li> <li>3. To use grammar and vocabulary effectively for communication.</li> <li>4. To write appropriate correspondence and reports for various professional and social contexts.</li> <li>5. To prepare students for various competitive exams by developing English Language competence.</li> </ol>
6.	<b>Course Outcomes (COs)</b>	<p>On completion of this course, learners will be able to:</p> <p>CO1. Imbibe values which make them aware of national heritage and making them responsible citizens.</p> <p>CO2. Critically read texts to identify main ideas, infer meanings, and assess the author's purpose.</p> <p>CO3. Use grammar and vocabulary effectively for communication.</p> <p>CO4. Write appropriate correspondence and reports for various professional and social contexts.</p> <p>CO5. Prepare for various competitive exams by developing their English Language competence.</p>
7.	<b>Expected Job Role/career opportunities</b>	<ul style="list-style-type: none"> <li>• Content Writer</li> <li>• Copy Editor</li> <li>• Proofreader</li> <li>• Corporate Communication Executive</li> <li>• Customer Relationship Executive</li> </ul>
8.	<b>Credit Value</b>	<b>Theory – 2 Credits</b>
9.	<b>Total Marks</b>	<b>Max. Marks: 100      Min. Passing Marks: 35</b>



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## PART B: Content of the Course (Theory)

Total No. of Lectures: 30 Hrs.

Unit	Topics	No. of Lectures
I	<p><b>Understanding Indian Culture</b></p> <ol style="list-style-type: none"><li>1. Rabindranath Tagore "Where the mind is without fear"</li><li>2. Swami Vivekananda - "Chicago Speech (1893)"</li><li>3. R. K. Narayan - "Astrologer's Day"</li><li>4. Introduction to Sundarkand of Valmiki's Ramayan</li><li>5. A.L Basham: "The wonder that was India" (an excerpt)</li></ol> <p><b>Keywords:</b> Heritage, Diversity, Pluralism, Values, Patriotism, Spirituality, Humanism, Social Harmony, Tradition, Modernity.</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"><li>• Group Discussion on theme - "fearless thinking &amp; nationalism" (Tagore), "religious harmony &amp; tolerance" (Vivekananda), "social observations" (R.K. Narayan).</li><li>• Creative Expression-Poster or Collage on "What Indian culture means to me,"</li><li>• A short presentation on a specific cultural aspect of the students' home state (e.g., a festival, a craft, a local custom).</li></ul>	12
II	<p><b>Comprehension Skills</b></p> <ol style="list-style-type: none"><li>1. Reading Techniques: Skimming, Scanning</li><li>2. Identifying the Main Idea and Theme</li><li>3. Making Inferences and Drawing Conclusions</li><li>4. Analysing unseen passages on Indian history, society, and art.</li></ol> <p><b>Keywords</b> - Inference, Main Idea, Theme, Tone, Purpose, Context Clues, Summary, Paraphrasing, Critical Reading</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"><li>• Worksheets with unseen passages followed by questions on comprehension, vocabulary, and inference.</li><li>• Summarizing articles from newspapers or magazines on cultural or social issues in India.</li></ul>	02



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III	<p><b>Basic Language Skills</b></p> <p><b>Grammar:</b></p> <ol style="list-style-type: none"> <li>1. Parts of Speech</li> <li>2. Articles</li> <li>3. Subject-Verb Agreement</li> <li>4. Tenses and their application</li> </ol> <p><b>Vocabulary:</b></p> <ol style="list-style-type: none"> <li>1. Synonyms, Antonyms, Homonyms, and Homophones</li> <li>2. One-word substitutes</li> <li>3. Word formation: Suffixes and Prefixes</li> </ol> <p><b>Keywords-</b>Tense, Agreement, Clause, Phrase, Synonym, Antonym, Prefix, Suffix.</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Grammar exercises (fill-in-the-blanks, error correction, sentence transformation).</li> <li>• Vocabulary-building games and quizzes.</li> </ul>	08
IV	<p><b>Writing Skills</b></p> <ol style="list-style-type: none"> <li>1. The Writing Process: Pre-writing, Drafting, Revising, and Editing</li> <li>2. Paragraph Writing: Structure, Topic Sentence, and Coherence.</li> <li>3. Letter writing: Formal/Informal</li> </ol> <p><b>Keywords:</b> Cohesion, Coherence, Topic Sentence, Drafting, Revising, Editing</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Paragraph on given topics (e.g., "My Favourite Indian Festival," or "The Importance of Technology in Modern India").</li> <li>• Letter/Application writing exercises</li> <li>• Essay Writing on contemporary relevant issues.</li> </ul>	04
V	<p><b>Situational Conversation-Context, Audience, Purpose, Type, Register</b></p> <ol style="list-style-type: none"> <li>1. Meeting/Greeting - Introducing Self, Introducing people to one another</li> <li>2. Apologies/Responses</li> <li>3. Enquiring about a Course/ Requesting Information</li> <li>4. Agreeing/Disagreeing (with a Proposal)</li> </ol> <p><b>Keywords</b> - Register, Tone, Style, Audience, Purpose,-Context, Etiquette, Persuasion.</p>	04



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<p><b>Activity:</b></p> <ul style="list-style-type: none"><li>• Introducing and Greeting (e.g., formal business meeting, college orientation, conference with a guest speaker, informal club gathering).</li><li>• Debate-Agreeing &amp; Disagreeing with Proposals - such as: "The college should make attendance optional for lectures."</li></ul>	
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## Part C-Learning Resources

### Text Books, Reference Books, Other resources

1. Tagore,R (1912). Gitanjali (Song Offerings). London: Macmillan. "Where the Mind is Without Fear" is Poem No. 35 in this collection.
2. Complete Works of Swami Vivekananda. Vol. 1. Advaita Ashrama (Publication Department of Ramakrishna Math, Belur Math, Kolkata).
3. Swami Tapasyananda, Sundarkandam of Srimad Valmiki Ramayana, Sri ram Krishna Math, Madras
4. Narayan, R.K. Malgudi Days. Indian Thought Publications; Ist edition (11 December 2019); ISBN-10: 9788185986173
5. Cultural Heritage of India by S. Radhakrishnan & Haridas Bhattacharyya (ed.)
6. A Course in English Grammar and Composition by Geetha Nagaraj
7. Functional English by Dr. P. Kiranmai Duit & Geetha Rajeevan (Foundation Books/Cambridge India)
8. Communicative English by E. Suresh Kumar, P. Srechari, and J. Savithri (Orient Black Swan)
9. Practical English Usage by Michael Swan (Oxford)
10. Modern English Grammar by N.Krishnaswany, Macmillan Publication
11. Developing Reading Skills: A Practical Guide to Reading Comprehension Exercises" by Francoise Grellet (Cambridge)
12. Writing Skills by Norman Coe, Robin Rycroft & Pauline Ernest (Cambridge)

### Suggested Equivalent Online Course

1. NPTEL Course-"Communication Skills" (by IIT Kharagpur)  
<https://nptel.ac.in/courses/109/106/109106175/>
2. Swayam Course - "English Language for Competitive Exams" (by IIT Madras)  
[https://onlinecourses.nptel.ac.in/noc23\\_hs51/preview](https://onlinecourses.nptel.ac.in/noc23_hs51/preview)
3. British Council India - "Learn English: Speaking and Writing Skills"  
<https://www.britishcouncil.in/english/courses-adults/learnonline>
4. Coursera "Write Professional Emails in English" (by Georgia Tech)  
<https://www.coursera.org/learn/professional-emails-english>



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## Part D- Assessment and Evaluation

### Suggested Continuous Evaluation Methods:

Maximum Marks : 100 Marks

<b>External Assessment:</b> University Exam Section: Time : 03.00 Hours	<b>Section (A):</b> Very Short Questions (50 Words)	5*4=20
	<b>Section (B):</b> Short Questions (200 Words)	5*10=50
	<b>Section (C):</b> Long Questions (500 Words)	2*15=30



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<b>PART – A: Introduction</b>			
<b>Programme: B.Sc./BCA/BBA /BBA FT/BBA HA</b>			
<b>Class: I Year</b>		<b>Semester: II</b>	<b>January-June 2026</b>
<b>Subject: Value Added Course (VAC)</b>		<b>Theory / Practical: Theory</b>	
1.	<b>Course Code</b>	VAC – 201	
2.	<b>Course Title</b>	भारत बोध (Understanding India)	
3.	<b>Course Type (Core Course/DSE/Minor/M D-ID/SEC/VOC)</b>	VAC	
4.	<b>Pre-Requisite (if any)</b>	Class 12 <sup>th</sup> Pass	
5.	<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To develop a fundamental understanding of India's historical, cultural, and Constitutional Nature (Sanvidhanik Swaroop).</li> <li>2. To develop awareness among students towards the Indian education system, the tradition of knowledge, and national values.</li> <li>3. To help students understand the India's independence movement, democratic development, and global role.</li> <li>4. To make students responsible citizens by providing knowledge of the rights and duties enshrined in the Constitution.</li> </ol>	
6.	<b>Course Outcomes (COs)</b>	<p>On completion of the course, learners will be able to:</p> <p>CO1. Develop a fundamental understanding of India's historical, cultural, and social diversity.</p> <p>CO2. Develop awareness towards the Indian knowledge tradition and national values.</p> <p>CO3. Understand the India's independence movement, development journey, and global role.</p> <p>CO4. Become responsible citizens by acquiring knowledge of the rights and duties enshrined in the Constitution.</p>	
7.	<b>Expected Job Role / Career Opportunities</b>	<ul style="list-style-type: none"> <li>• Civil service candidates</li> <li>• Social workers</li> <li>• Journalists/media professionals</li> <li>• Counselors/motivational trainers</li> <li>• Legal assistants</li> </ul>	
8.	<b>Credit Value</b>	2 Credits	
9.	<b>Total Marks</b>	<b>Max. Marks: 100</b>	<b>Min. Passing Marks: 35</b>



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PART – B: Content of the Course		
No. of Lectures per week: 02 Hours per week)		
Total No. of Lectures Required: T: 30 Hours		
Unit	Topics	No. of Lectures
I	<p><b>Indian History and Cultural Heritage</b> Characteristics of the Sindhu, Vedic, and Classical periods Indian concepts of co-existence and diversity Cultural Symbols: Religious architecture, music, dance and folk traditions Modern relevance of texts such as “Vasudhaiva Kutumbakam” and “Sarve Bhavantu Sukhinah”</p> <p><b>Activity:</b> The program "Dialogue with the People"-discussion and note-taking about traditional lifestyle-values and knowledge from an elder of the family or community</p> <p><b>Assignment:</b> Write a short essay (about 500 words) with pictures on any cultural heritage/festival/folk art of your village or town.</p>	06
II	<p><b>Indian Constitution and Civic Duties</b> The Vedic Concept of State Duties(Vedic Rajdharma) and the modern Constitution Fundamental Rights and Duties: Dharma-Kartavya-Naitikta Youth citizens and their democratic participation Role of Education to Nation-Building</p> <p><b>Activity:</b> “Public Policy Dialogue” – Organizing a Mock Constituent Assembly among students, where the fundamental values of India are presented and discussed.</p> <p><b>Assignment 1:</b> Analyze any one fundamental right and its related duty from a Vedic/classical perspective.</p> <p><b>Assignment 2:</b> Write an essay (400 words) on the role of youth in Indian democracy, from the perspective of “From Swaraj to Suraj”.</p>	06



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<b>III</b>	<p><b>Indian Knowledge Tradition and Educational Perspective</b> Sources of Indian knowledge: Vedas, Upanishads, Philosophy, Smriti, Folk literature Gurukul Tradition: Student-centered learning, oral tradition, and memory-based learning Purpose of Education: Self-realization (Atmokaarsha) and social welfare (Lokasangraha) Role of the Teacher: "Acharya Devo Bhava"- character building and contribution to social reconstruction</p> <p><b>Activity 1:</b> Knowledge-sharing session: Demonstration of traditional teaching methods (dialogue, memorization-based learning).</p> <p><b>Activity 2:</b> Recreation of Shlokas and meaning- based discussion - Especially from Shikshavalli and Bhagavad Gita etc.</p> <p><b>Assignment 1:</b> Explain the objectives of Indian education based on any Vedic hymn or Upanishadic statement.</p> <p><b>Assignment 2:</b> Write a short essay on examples of Guru-Shishya tradition or life values observed in your school, village, or family.</p>	<b>06</b>
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<b>IV</b>	<p><b>India's Philosophy of Life and the Concept of a Sustainable Future</b> Indian Life Perspective: Purusharth Chatushtaya, Ashrama system, Duty-Based Ethics Harmony with Nature: Yagya, Panchamahabhutas, ecological cycle and environmental balance Indian Economic Thought: Arthashastra, Swadeshi, labour culture, and public sector enterprises Indian Concept of Sustainable development and environmental balance</p> <p><b>Activity 1:</b> Poster or slogan writing on "Simple Living, High Thinking"</p> <p><b>Activity 2:</b> Group presentation on Indian environmental traditions (yagya, tree worship, river, festivals, etc.)</p> <p><b>Assignment 1:</b> Panchamahabhutas and Indian life perspective</p> <p><b>Assignment 2:</b> Journey from 'Swadeshi' to 'Atmanirbhar Bharat' (Self-reliant India)</p>	<b>06</b>
<b>V</b>	<p><b>Contemporary India and Global Role</b> Role of Religious, Cultural, and Intellectual Leadership in the Indian independence movement India's contributions: Space science, Yoga, diplomacy, peace philosophy Atmanirbhar Bharat: Integration of tradition and innovation India's soft power in the global context and its role in a multipolar world</p> <p><b>Activity 1:</b> Student presentation on policy alternatives (Indian Model vs Western Model)</p> <p><b>Activity 2:</b> Essay writing on the theme "<i>India @ 2047</i>"</p> <p><b>Assignment 1:</b> Global India and Possibilities of Cultural Leadership</p> <p><b>Assignment 2:</b> Technology and Ethics: Exploring the Indian Model of Integration</p>	<b>06</b>



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<b>Part – C: Learning Resources</b>
<b>Textbooks, Reference Books, Other Resources</b>
<b>Suggested Readings:</b> <ol style="list-style-type: none"><li>1. Katdre, Indumati – Bharatiya Shiksha: Sankalpna evam Swaroop/ Punarsrijan, Prakashan Seva trust, Ahmedabad</li><li>2. Kumar, Krishan – PrachinBharatiya Shiksha Paddhati, Shri Saraswati Sadan, Delhi</li><li>3. Saluja, Chand Kiran (2023) – Shiksha: BharatiyaPariprekshya Sanskrit Samvardhan Pratishthan, New Delhi</li><li>4. Kapoor, Kapil &amp; Singh, Avdhesh Kumar (Editor), (2005) – <b>Indian Knowledge Systems</b> (Khand 1-2) Indian Institution of Advance Study, Shimla; D.K. Printworld, New Delhi</li></ol>
<b>Textbooks:</b> <ol style="list-style-type: none"><li>1. Swaroop, Devendra – Sanskriti: Ek Naam – Roop, Anek Pratiman Pratibha Prakashan, New Delhi</li><li>2. Swaroop, Devendra (Editor), (2010) – Rashtriya Shiksha Andolan ka Itihas (Hindi Sanskaran) Prabhat Pratisthan, New Delhi</li><li>3. Agrawal, Vasudev Sharan (Editor), (2023) – Rashttra, Dharma aur Sanskriti (Nibandh Sanchayan). Prabhat Prakashan, New Delhi</li></ol>
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. Mishra, Rameshwar Pankaj (2024) – Advitiya samajshastra, Prabhat Prakashan, New Delhi</li><li>2. Pandey, Om Prakash (Editor) (2023) – Bharat Vaibhav, Rashtriya Pustak Nyas (NBT) , New Delhi</li><li>3. Subbarayappa, B.V. – Bhartiya Vigyan Parampara, Rashtriya Pustak Nyas (NBT) , New Delhi</li></ol>
<b>Suggestive Digital Platform Web Links:</b> <ul style="list-style-type: none"><li>● <a href="https://www.youtube.com/watch?v=VUOyldPx8h4">https://www.youtube.com/watch?v=VUOyldPx8h4</a></li><li>● <a href="https://www.youtube.com/watch?v=1livkUGjeFA&amp;list=PLfGFNxUDX0eholQwKZ2ekqaxY3PDtoDq-&amp;index=4">https://www.youtube.com/watch?v=1livkUGjeFA&amp;list=PLfGFNxUDX0eholQwKZ2ekqaxY3PDtoDq-&amp;index=4</a></li><li>● <a href="https://www.youtube.com/watch?v=SuMnvLxc9ic">https://www.youtube.com/watch?v=SuMnvLxc9ic</a></li><li>● <a href="https://www.youtube.com/watch?v=iPuRqFlmoSc">https://www.youtube.com/watch?v=iPuRqFlmoSc</a></li><li>● <a href="https://www.youtube.com/watch?v=YZQeUq5d48Q&amp;list=PL_a1TI5CC9RG8wPaNNDOK6VjSdhe0K3HE&amp;index=6">https://www.youtube.com/watch?v=YZQeUq5d48Q&amp;list=PL_a1TI5CC9RG8wPaNNDOK6VjSdhe0K3HE&amp;index=6</a></li><li>● <a href="https://www.youtube.com/watch?v=9PLs_N6WbxE">https://www.youtube.com/watch?v=9PLs_N6WbxE</a></li></ul>



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<b>Part – D: Assessment and Evaluation</b>		
<b>Only External Assessment</b>		<b>Total Marks: 100</b>
<b>External Assessment End Semester Exams Time: 03 Hours</b>	(A) Five Short Answer Type Questions	<b>Total Marks: 100</b>
	(B) Five Long Answer Type Questions	
<b>Total Marks</b>	100	
<b>Credit Value</b>	02	
<b>Minimum Passing Marks</b>	35	



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भाग अ : परिचय		
कार्यक्रम : बी.एस.सी./बी.सी.ए/बी.बी.ए./बी.बी.ए. एफ. टी./बी.बी.ए. एच.ए.		
कक्षा : I वर्ष	सेमेस्टर: II	सत्र: जनवरी – जून 2026
विषय: Value Added Course (VAC)	Theory/ Practical: Theory	
1.	पाठ्यक्रम कोड	VAC – 201
2.	पाठ्यक्रम शीर्षक	भारत बोध (Understanding India)
3.	पाठ्यक्रम प्रकार (कोर कोर्स/वोकेशनल) डीएसई/ माइनर /एमडी-आईडी/एसईसी/वीओ सी)	VAC
4.	पूर्वापेक्षा (यदि कोई हो)	कक्षा 12 वी उत्तीर्ण
5.	पाठ्यक्रम का उद्देश्य	<ol style="list-style-type: none"><li>1. भारत के ऐतिहासिक, सांस्कृतिक और सवैधानिक स्वरूप की मूलभूत समझ विकसित करना।</li><li>2. भारत शिक्षा पद्धति, ज्ञान परंपरा और राष्ट्रीय मूल्यों के प्रति छात्रों में संवेदनशीलता उत्पन्न करना।</li><li>3. भारत की स्वतंत्रता संग्राम, लोकतांत्रिक विकास और वैश्विक भूमिका को समझने में सहायता करना।</li><li>4. संविधान में निहित दायित्वों एवं अधिकारों की जानकारी देकर छात्रों को जिम्मेदार नागरिक बनाना।</li></ol>
6.	पाठ्यक्रम अध्ययन की उपलब्धियां (कोर्स लर्निंग आउटकम)	<p>इस कोर्स का अध्ययन करने के बाद विद्यार्थी में,</p> <ol style="list-style-type: none"><li>1. विद्यार्थी भारत की ऐतिहासिक,सांस्कृतिक और सामाजिक विविधता की मूलभूत समझ विकसित कर सकेंगे।</li><li>2. विद्यार्थी भारतीय ज्ञान परंपरा और राष्ट्रीय मूल्यों के प्रति संवेदनशीलता विकसित कर सकेंगे।</li><li>3. विद्यार्थी भारत के स्वतंत्रता संग्राम, विकास यात्रा और वैश्विक भूमिका को समझ सकेंगे।</li><li>4. विद्यार्थी संविधान में निहित अधिकारों एवं कर्तव्यों का ज्ञान प्राप्त कर जिम्मेदार नागरिक बन सकेंगे।</li></ol>
7.	संभावित नौकरी भूमिकाएँ/ करियर अवसर	<ul style="list-style-type: none"><li>• सिविल सेवा अभ्यर्थी</li><li>• सामाजिक कार्यकर्ता</li><li>• पत्रकार / मीडिया प्रोफेशनल</li><li>• काउंसलर / मोटिवेशनल ट्रेनर</li><li>• कानून से जुड़े सहायक कार्य</li></ul>



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8.	क्रेडिट मान	02	
9.	कुल अंक	अधिकतम अंक: 100	न्यूनतम अंक: 35

भाग ब-पाठ्यक्रम सामग्री	
प्रति सप्ताह कक्षाओं की संख्या: 2 घंटे प्रति सप्ताह	
आवश्यक व्याख्यानों की कुल संख्या : थ्योरी (T) 30 घंटे	
ईकाई	विषय
I	<p><b>भारतीय इतिहास और सांस्कृतिक विरासत</b></p> <ul style="list-style-type: none"><li>● सिन्धु, वैदिक, और शास्त्रीय काल की विशेषताएँ</li><li>● सह-अस्तित्व और बहुलता की भारतीय अवधारणा</li><li>● सांस्कृतिक प्रतीक : धर्म स्थापत्य, संगीत, नाट्य, लोकाचार</li><li>● 'वसुधैव कुटुम्बकम्', 'सर्वे भवन्तु सुखिनः' जैसे सूत्रों की आधुनिक प्रासंगिकता</li></ul> <p><b>गतिविधियाँ :</b></p> <ul style="list-style-type: none"><li>● 'लोक से संवाद' कार्यक्रम-परिवार या समुदाय के किसी बुजुर्ग से पारंपरिक जीवन-मूल्य एवं ज्ञान पर चर्चा, और उसका लेखा-जोखा।</li></ul> <p><b>असाइनमेंट विषय:</b></p> <ul style="list-style-type: none"><li>● अपने गाँव या नगर की किसी स्थानीय सांस्कृतिक धरोहर/पर्व/लोककलाओं का लघु लेख चित्रों सहित तैयार करें (500 शब्द)।</li></ul>
II	<p><b>भारतीय संविधान और नागरिक दायित्व</b></p> <ul style="list-style-type: none"><li>● वैदिक राजधर्म और आधुनिक संविधान</li><li>● मूल अधिकार और कर्तव्य : धर्म-कर्तव्य – नैतिकता</li><li>● युवा नागरिक और लोकतांत्रिक भागीदारी</li><li>● शिक्षा का राष्ट्रनिर्माण में योगदान</li></ul> <p><b>गतिविधियाँ:</b></p> <ul style="list-style-type: none"><li>● 'जननीति संवाद'-छात्रों के बीच मॉक संविधान सभा या युवा संसद का आयोजन, जिसमें भारत के मूल मूल्य प्रस्तुत करें।</li></ul> <p><b>असाइनमेंट विषय:</b></p> <ul style="list-style-type: none"><li>● किसी एक मौलिक अधिकार और उससे जुड़े कर्तव्य का वैदिक/शास्त्रीय दृष्टिकोण से विश्लेषण करें।</li><li>● भारतीय लोकतंत्र में युवाओं की भूमिका पर 'स्वराज से सुराज तक' दृष्टिकोण में निबंध (400 शब्द)</li></ul>



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<p style="text-align: center;"><b>III</b></p>	<p><b>भारतीय ज्ञान परंपरा और शिक्षा दृष्टिकोण</b></p> <ul style="list-style-type: none"><li>● भारतीय ज्ञान के स्रोत : वेद, उपनिषद, दर्शन, स्मृति, लोक साहित्य</li><li>● गुरुकुल परंपरा: शिष्य-केंद्रित शिक्षण, वाचिक परंपरा और स्मृति आधारित अधिगम</li><li>● शिक्षा का उद्देश्य : आत्मोत्कर्ष एवं लोकसंग्रह</li><li>● शिक्षक की भूमिका 'आचार्य देवो भवः' चरित्र निर्माण, सामाजिक पुनर्निर्माण में योगदान</li></ul> <p><b>गतिविधियाँ:</b></p> <ul style="list-style-type: none"><li>● ज्ञानवार्ता गोष्ठी-शास्त्रीय शिक्षा पर आधारित शिक्षण पद्धति (उदाहरण: संवाद, स्मृति आधारित अभ्यास) का डेमो प्रस्तुत करना।</li><li>● श्लोक-गायन और उसका अर्थार्थ संवाद-विशेष रूप से शिक्षावल्ली (तैत्तिरीयोपनिषद), गीता आदि से।</li></ul> <p><b>असाइनमेंट विषय:</b></p> <ul style="list-style-type: none"><li>● किसी वैदिक ऋचा या उपनिषद वाक्य के आधार पर भारतीय शिक्षा के उद्देश्य का विवेचन करें।</li><li>● अपने विद्यालय/ग्राम/परिवार में देखे गए गुरु-शिष्य परंपरा या जीवन-परमार्थ के उदाहरण पर लघु लेख।</li></ul>
<p style="text-align: center;"><b>IV</b></p>	<p><b>भारत का जीवन – दर्शन और सतत भविष्य की अवधारणा</b></p> <ul style="list-style-type: none"><li>● भारतीय जीवन –दृष्टि: पुरुषार्थ चतुष्टय, आश्रम व्यवस्था और कर्तव्य आधारित नैतिकता</li><li>● प्रकृति के साथ सामंजस्य: यज्ञ, पंचमहाभूत ऋतुचक्र और पर्यावरण संतुलन</li><li>● भारतीय अर्थदर्शन: अर्थशास्त्र , स्वदेशी , श्रम-संस्कृति और लोक-उद्यम</li><li>● सतत विकास और पर्यावरणीय न्याय की भारतीय अवधारणा</li></ul> <p><b>गतिविधियाँ:</b></p> <ul style="list-style-type: none"><li>● 'सादा जीवन उच्च विचार' विषय पर पोस्टर या स्लोगन लेखन</li><li>● भारतीय पर्यावरणीय परंपराओं (जैसे यज्ञ, वृक्ष-पूजन, नदी महोत्सव आदि) पर समूह प्रस्तुति</li></ul> <p><b>असाइनमेंट विषय:</b></p> <ul style="list-style-type: none"><li>● पंचमहाभूत और भारतीय जीवन-दृष्टि</li><li>● स्वदेशी से 'आत्मनिर्भर भारत' तक की यात्रा</li></ul>



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<b>V</b>	<p><b>समकालीन भारत और वैश्विक भूमिका</b></p> <ul style="list-style-type: none"><li>● स्वतंत्रता संग्राम में धार्मिक, सांस्कृतिक और बौद्धिक नेतृत्व की भूमिका</li><li>● भारत का योगदान: अंतरिक्ष विज्ञान, योग, कूटनीति, शांति दर्शन</li><li>● 'आत्मनिर्भर भारत' परंपरा और नवाचार का समन्वय</li><li>● वैश्विक परिप्रेक्ष्य में भारत 'सॉफ्ट पावर', बहुध्रुवीय विश्व में भूमिका</li></ul> <p><b>गतिविधियाँ:</b></p> <ul style="list-style-type: none"><li>● छात्रों द्वारा नीति – विकल्प प्रस्तुत करना (Indian Model vs Western Model)</li><li>● "भारत @ 2047" विषय पर निबंध</li></ul> <p><b>असाइनमेंट विषय:</b></p> <ul style="list-style-type: none"><li>● "ग्लोबल भारत और सांस्कृतिक नेतृत्व की संभावना"</li><li>● "तकनीक और नैतिकता : भारतीय समन्वय की खोज"</li></ul>
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<b>भाग-स: अध्ययन संसाधन</b>
<b>पाठ्यपुस्तकें, संदर्भ पुस्तकें, अन्य संसाधन</b>
<p><b>अनुशंसित पाठ्यसामग्री</b></p> <ol style="list-style-type: none"><li>1. काटदरे, इंदुमति। भारतीय शिक्षा : संकल्पना एवं स्वरूप/ पुनरुत्थान प्रकाशन सेवा ट्रस्ट, अहमदाबाद।</li><li>2. कुमार, कृष्ण। प्राचीन भारतीय शिक्षा पद्धति। श्री सरस्वती सदन, दिल्ली।</li><li>3. सलूजा, चंद किरण (2023)। शिक्षा: भारतीय परिप्रेक्ष्य। संस्कृत संवर्धन प्रतिष्ठान, नई दिल्ली।</li><li>4. कपूर, कपिल एवं सिंह, अवधेश कुमार(संपादक)। (2005)। Indian Knowledge Systems (खंड 1-2)। इंडियन इंस्टिट्यूट ऑफ एडवांस्ड स्टडी, शिमला; डी.के. प्रिंटवर्ल्ड, नई दिल्ली।</li></ol>
<p><b>पाठ्यपुस्तकें:</b></p> <ol style="list-style-type: none"><li>1. स्वरूप, देवेद्र। संस्कृति एक: नाम-रूप अनेक प्रतिभा प्रकाशन, नई दिल्ली।</li><li>2. स्वरूप, देवेद्र। (संपादक)। (2010)। राष्ट्रीय शिक्षा आंदोलन का इतिहास (हिंदी संस्करण)। प्रभात प्रतिष्ठान, नई दिल्ली।</li><li>3. अग्रवाल, वासुदेव शरण (संपादक)। (2023)। राष्ट्र, धर्म और संस्कृति (निबंध संचयन)। प्रभात प्रकाशन, नई दिल्ली।</li></ol>
<p><b>संदर्भपुस्तकें:</b></p> <ol style="list-style-type: none"><li>1. मिश्र, रामेश्वर 'पंकज '(2024)। अद्वितीय समाजशास्त्र। प्रभात प्रकाशन, नई दिल्ली।</li><li>2. पाण्डेय, ओम प्रकाश (संपादक)। (2023)। भारत वैभव। राष्ट्रीय पुस्तक न्यास (एनबीटी), नई दिल्ली।</li><li>3. सुब्बारायप्पा, बी.वी.। भारतीय विज्ञान परंपरा। राष्ट्रीय पुस्तक न्यास (एनबीटी), नई दिल्ली।</li></ol>



# SHRI VAISHNAV INSTITUTE OF MANAGEMENT & SCIENCE, INDORE

(Autonomous)

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ISO 9001:2015 Certified

## अनुशसित डिजिटल प्लेटफॉर्म वेब लिंक:

- <https://www.youtube.com/watch?v=VUOyldPx8h4>
- <https://www.youtube.com/watch?v=1livkUGjeFA&list=PLfGFNxUDX0eholQwKZ2ekqaxY3PDtoDq-&index=4>
- <https://www.youtube.com/watch?v=SuMnvLxc9ic>
- <https://www.youtube.com/watch?v=iPuRqFlmoSc>
- [https://www.youtube.com/watch?v=YZQeUq5d48Q&list=PL\\_a1TI5CC9RG8wPaNNDOK6VjSdhe0K3HE&index=6](https://www.youtube.com/watch?v=YZQeUq5d48Q&list=PL_a1TI5CC9RG8wPaNNDOK6VjSdhe0K3HE&index=6)
- [https://www.youtube.com/watch?v=9PLs\\_N6WbxE](https://www.youtube.com/watch?v=9PLs_N6WbxE)

भाग-द: आकलन एवं मूल्यांकन		
केवल बाह्य मूल्यांकन		कुल अंक: 100
बाह्य मूल्यांकन अंतिम सेमेस्टर परीक्षा समय: 03 घंटे	(अ) पांच लघु प्रश्न (ब) पांच दीर्घ उत्तरीय प्रश्न	कुल अंक: 100
अधिकतम अंक	100	
क्रेडिट मान	02	
न्यूनतम उत्तीर्ण अंक	35	