



St. Paul Institute of Professional Studies, Indore

An Autonomous Institute Affiliated to Devi Ahilya Vishwavidyalaya, Indore

Accredited by NAAC with 'A' Grade

Phone No. 0731-2499911, 49661355, 4961356

E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com



PART A: Introduction

Program: Certificate		Class: B.C.A.	Year: I Year	Session: 2025-26
Subject: Computer Applications				
1.	Course Code	BC-S101T		
2.	Course Title	Computer Architecture (Theory)		
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major -I (Core Course)		
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.		
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: 1. About the contributions of ancient Indian scholars (Pingala, Panini) and modern Indian scientists in the field of computer architecture. 2. An understanding of number systems, binary arithmetic, coding schemes, logic gates, and Boolean algebra. 3. Design and analyze combinational and sequential circuits. 4. To describe and evaluate the organization of computer systems, including instruction sets, control units (RISC/CISC), pipelining and so on. 5. To understand real-world problem solving, thereby preparing for career opportunities in computer hardware design, embedded systems, networking, and IT industries.		
6.	Credit Value	Theory - 4 Credits		
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks: 35	

PART B: Content of the Course

Total No. of Lectures: 60

Module	Topics	No. of Lectures
1	Indian Knowledge System: Ancient Indian Contribution in Computer Architecture: Pingala's "Chandahśāstra", Panini Sanskrit Grammar. Modern Contribution: Dr. Vinod Dhami, Dr. Ajay Bhat, Dr. Vinod Khosla, Dr. Vijay P Bhatkar.	02

Handwritten signatures and initials:
A.S., P.S., G.T., S. G. Sharda, Anamika, A.S., P.S., S. G. Sharda, Anamika, A.S., P.S., S. G. Sharda, Anamika



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V	<p>Processor and Control Unit: Hardwired vs. Micro programmed Control Unit, General Register Organization, Stack Organization, Instruction Format, Data Transfer & Manipulation, Program Control, Introductory concept of RISC, CISC, advantages and disadvantages of both.</p> <p>Pipelining: concept of pipelining, introduction to Pipelined data path and control – Handling Data hazards & Control hazards.</p> <p><i>Suggested Activities:</i> Debate on Hardware vs. Microprogrammed Control, Assignment on designing a simplified processor. Discussion on RISC vs. CISC architectures, Analyze how modern processors handle instruction execution</p>	12
VI	<p>Memory and I/O Systems - Peripheral Devices, I/O Interface.</p> <p>Data Transfer Schemes - Program Control, Interrupt, DMA Transfer, I/O Processor.</p> <p>Memory Hierarchy, Processor vs. Memory Speed, High-Speed Memories, Main memory, Auxiliary memory, Cache Memory, Associative Memory, Interleaving, Virtual Memory, Memory Management.</p> <p>Ancient Manuscript Storage (Nalanda, Takshashila Libraries): Similarity to hierarchical memory and indexing methods.</p> <p><i>Suggested Activities:</i> Understanding memory allocation in modern computers, Compare manuscript storage methods with modern hierarchical memory, Field Visit (if possible): Visit a digital archive/library to understand memory organization</p>	10

Note - Individual passing marks are required in External, Internal, and Practical

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Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **100**
Continuous Comprehensive Evaluation (CCE): **30 Marks**
Autonomous Exam (AE) : **70 Marks**

Internal Assessment:

Continuous Comprehensive Evaluation (CCE)	Class Test /Assignment Presentation/ Quiz / Peer Teaching	Total Marks: 30
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External Assessment:

Autonomous Exam Section Time: 03.00 Hours	Section (A) : Multiple Choice Questions Section (B) : Short Questions Section (C) : Long Questions	Total Marks: 70
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PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
Session: 2025-26			
Subject: Computer Applications			
1.	Course Code	BC-S101P	
2.	Course Title	Computer Architecture (Practical)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major - 1 (Core Course)	
4.	Pre-Requisite (if any)	Nil	
5.	Course Learning Outcomes(CLO)	After the completion of this course, a successful student will be able to do the following: 1. Realization of the basic logic and universal gates. 2. Verify the behavior of logic gates using truth tables. 3. Implement Binary-to -Gray, Gray-to -Binary code conversions. 4. Design half and full adder circuit using basic gates. 5. Design and construct flip flops and verify the excitation tables. 6. To understand real-world problem solving, thereby preparing for career opportunities in computer hardware design, embedded systems, networking, and IT industries	
6.	Credit Value	Practical - 2 Credits	
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35

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Suggestive list of Practical's

1. Verification and interpretation of truth table for AND, OR, NOT gates
2. Verification and interpretation of truth table for NAND, NOR gates
3. Verification and interpretation of truth table for Ex-OR, Ex-NOR gates
4. Study of half adder using XOR and NAND gates and verification of its operation
5. Study of full adder using XOR and NAND gates and verification of its operation
6. Study of half subtractor and verification of its operation
7. Study of full subtractor and verification of its operation
8. Realization of logic functions with the help of NAND -Universal Gates
9. Realization of logic functions with the help of NOR -Universal Gates
10. Verify the truth table of RS flip-flops using NAND and NOR gates
11. Verify the truth table of JK flip-flops using NAND and NOR gates
12. Verify the truth table of T and D flip-flops using NAND and NOR gates
13. Implementation of 4x1 multiplexer using logic gates
14. Implementation of 1x4 demultiplexer using logic gates
15. Verify Gray to Binary conversion using NAND gates only
16. Verify Gray to Binary conversion using NAND gates only

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.
2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. M. Morris Mano: "Computer System Architecture", PHI.
4. Heuring Jordan: "Computer System Design & Architecture" (A.W.L.).
5. Donald P Leach, Albert Paul Malvino, Goutam Saha: "Digital Principles & Applications", Tata McGraw Hill Education Private Limited, 2011 Edition.
6. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।
7. RituSindhu, Computer Organisation & Architecture, August 2024, New Age International

Reference Books:

1. William Stalling, "Computer Organization & Architecture", Pearson Education Asia.
2. V. Carl Hamacher, "Computer Organization", TMH
3. Tannenbaum, "Structured Computer Organization", PHI.
4. Er. Rajiv Chopra, "Computer Architecture", Revised 3rd Edition, S. Chand & Company Pvt. Ltd

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Suggested Digital Platforms Web links:

<https://epgp.inflibnet.ac.in>

<https://www.eshiksha.mp.gov.in/mpdhe>

Suggested equivalent online courses

<https://nptel.ac.in/courses/106/105/10610516/>

<https://nptel.ac.in/courses/106/106/10610616/>

<https://nptel.ac.in/courses/106/106/10610613/>

PART D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Internal Assessment

Class Interaction/Quiz

Attendance

Total Marks 100

Assignments (Charts/ Model/Seminar/Rural Services/
Technology Dissemination/Report of Excursion/Lab
visit/ Survey/Industrial Visit)

Total 100

External Assessment

Viva voce practical

Practical record file

Table work/Experiment

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PART A: Introduction			
Program: Certificate	Class: B.C.A.	Year: I Year	Session: 2025-26
Subject: Computer Applications			
1.	Course Code	BC-S102T	
2.	Course Title	Programming Methodology (Theory)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major – II (Core Course)	
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.	
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: <ol style="list-style-type: none"> 1. Relate ancient and modern Indian contributions to core programming concepts. 2. Apply structured programming techniques using C++ for problem-solving. 3. Build modular applications using functions, classes, and inheritance in C++. 4. Use advanced C++ features to develop efficient and error-handled programs. 	
6.	Credit Value	Theory – 4 Credits	
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks: 35

PART B: Content of the Course		
Total No. of Lectures: 60		
Module	Topics	No. of Lectures
I	Indian Knowledge System: Ancient Indian Contribution: Brahmagupta "Chakravala method", Aryabhata Algorithm. The Panini Grammar System (Ashtadhyayi). Modern Contribution: Origin of Julia Programming Language, Indian Scientist who designed new programming languages and open source languages.	02

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	<i>Suggested Activities: Discuss how Panini's grammar rules resemble formal grammar in programming languages, Aryabhata Algorithm.</i>	
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II	<p>Introduction to Programming - Program Concept, Characteristics of Programming, Stages in Program Development, Algorithms, Notations, Design, Flowcharts, Types of Programming Methodologies.</p> <p>Basics of C++: A Brief History of C++, Application of C++, Compiling & Linking, Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Symbolic Constant, Type Compatibility, Reference Variables, Operator in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator.</p> <p>Conditional Statements if construct, switch-case construct.</p> <p>Iterative Statements: while, do-while, and for loops, use of break and continue in loops, Using Nested Statements (Conditional as well as Iterative).</p>	12
	<i>Suggested Activities: Implement a console-based quiz using formatted I/O, Use flowcharts and pseudocode tools to map variable types and memory usage.</i>	
III	<p>Functions In C++: The Main Function, Function Prototyping, Call by Reference Call by Address, Call by Value, Return by Reference, Inline Function, Default Arguments, Constant Arguments, Function Overloading, Function with Array.</p>	10
IV	<p>Classes & Objects: A Sample C++ Program with class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member, Functions, Array of Objects, Object as Function Arguments, Friend Functions, Virtual functions, Returning Objects, Constant member functions, Pointer to Members, Local Classes.</p>	12
	<i>Suggested Activities: Combine all the modules to create a comprehensive Library Management System with features like adding books, managing users, calculating late fees, and tracking library statistics. Design a Simple Banking System in C++.</i>	
V	<p>Constructor & Destructor: Constructor, Parameterized Constructor, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructor and Destructor.</p>	12

Handwritten signatures and initials:
 A, Bess, GC, G, Anon, G. B. S. D. S.
 A, ~~Aamir~~, M, G. S. S., C. S. S., M. S. S.



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PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

Textbooks:

1. Gerard G. Emch, R. Sridharan, M. D. Srinivas: Contributions to the History of Indian Mathematics, Hindustan Book Agency, Vol. 3, 2005.
2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. J. R. Hanly and E. B. Koffman, "Problem Solving and Program Design in C", Pearson, 2015.
4. E. Balguruswamy, "C++ ", TMH Publication ISBN O-07-462038-X eighth edition 2020
5. Herbert Schildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7.
6. Let us C++ by Yashwant Kanetkar, 2020
7. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें ।

Reference Books:

- R. Lafore, 'Object Oriented Programming C++'
N. Dale and C. Weems, "Programming and problem solving with C++: brief edition", Jones & Bartlett Learning.

Suggestive Digital Platform Web Links:

<https://www.eshiksha.mp.gov.in/mpdhe>

Suggested Equivalent Online Courses:

<https://nptel.ac.in/courses/106/105/106105151/> <https://nptel.ac.in/courses/106/105/106105234/>

Part D – Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **100**
Continuous Comprehensive Evaluation (CCE) : **30 marks**
Autonomous Exam (AE) : **70 Marks**

Internal Assessment	Class Test /Assignment Presentation/ Quiz / Peer Teaching	
Continuous Comprehensive Evaluation (CCE)		30
External Assessment	Section (A): Multiple Choice Questions Section (B): Short Questions Section (C): Long Questions	70
Autonomous Exam Section Time: 03:00 Hours		

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PART A: Introduction

Program: Certificate		Class: B.C.A.	Year: I Year	Session: 2025-26
Subject: Computer Applications				
1.	Course Code	BC-S102P		
2.	Course Title	Programming Methodology (Practical)		
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major – II (Core Course)		
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.		
5.	Course Learning Outcomes (CLO)	<p>After the completion of this course, a successful student will be able to do the following:</p> <ol style="list-style-type: none"> 1. Apply basic programming constructs to solve standard problems in C++. 2. Design algorithms and flowcharts, and implement them as executable programs. 3. Use functions and object-oriented concepts to build modular applications. 4. Employ advanced C++ features for efficient and structured problem-solving 		
6.	Credit Value	Practical – 2 Credits		
7.	Total Marks	Max. Marks: 30+70	Min. Passing Marks: 35	

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Textbooks, Reference Books, Other Resources

Suggested Readings:

Textbooks:

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2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. J. R. Hanly and E. B. Koffman, "Problem Solving and Program Design in C", Pearson, 2015
3. E. Balguruswamy, "C++ ", TMH Publication ISBN O-07-462038-X
4. Herbert Schildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7.
5. Let us C++, By Yashwant Kanetkar, 2020
6. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें ।

Reference Books:

- 1.R. Lafore, 'Object Oriented Programming C++'
- 2.N. Dale and C. Weems, "Programming and problem solving with C++: brief edition", Jones & Bartlett Learning.

Suggestive Digital Platform Web Links:

<https://www.eshiksha.mp.gov.in/mpdhe>

Suggested Equivalent Online Courses:

<https://nptel.ac.in/courses/106/105/106105151/> <https://nptel.ac.in/courses/106/105/106105234/>

PART D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Internal Assessment	External Assessment
Class Interaction/Quiz	Viva voce practical
Attendance	Practical record file
Assignments (Charts/ Model/Seminar/Rural Services/ Technology Dissemination/Report of Excursion/Lab visit/ Survey/Industrial Visit)	Table work/Experiment
Total	100

AS, PPS, [Signature], [Signature], [Signature]

 AS, [Signature], [Signature], [Signature], [Signature], [Signature]



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PART A: Introduction			
Program: Certificate		Class: B.C.A.	Year: I Year
		Session: 2025-26	
Subject: Computer Applications			
1.	Course Code	BC-S103P	
2.	Course Title	Data Structures (Practical)	
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Major – III (Core Course)	
4.	Pre-Requisite (if any)	To study this course , a student must have basic knowledge of Computers	
5.	Course Learning Outcomes(CLO)	<p>After the completion of this course, a successful student will be able to do the following:</p> <ol style="list-style-type: none"> 1. Will be familiar with fundamental data structures, their implementation; become accustomed to the description of algorithms in both functional and procedural styles. 2. Have knowledge of complexity of basic operations like insert, delete, search on these data structures. 3. Possess ability to choose a data structure to suitably model any data used in computer applications. 4. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc. 5. Assess efficiency tradeoffs among different data structure implementations. 6. Implement and know the applications of algorithms for searching and sorting. 7. Know the contributions of Indians in the field of programming and data structures. 	
6.	Credit Value	Practical - 2 Credits	
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35

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Suggested Digital Platforms Web links:
https://www.eshiksha.mp.gov.in/mpdhe
https://epgp.inflibnet.ac.in
Suggested equivalent online courses
https://nptel.ac.in/courses/106/102/106102064/
https://nptel.ac.in/courses/106/106/106106127/
https://nptel.ac.in/courses/106/105/106105085/

PART D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Internal Assessment	External Assessment
Class Interaction/Quiz	Viva voce practical
Attendance	Practical record file
Assignments (Charts/ Model/Seminar/Rural Services/ Technology Dissemination/Report of Excursion/Lab visit/ Survey/Industrial Visit)	Table work/Experiment
Total	100

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PART B: Content of the Course

Total No. of Lectures: 60

Module	Topics	No. of Lectures
I	Indian Knowledge System: Basic concepts of Mathematical Logic in ancient India: Panini's Logical Structure, Avaktavtakta, Navya-Nyaya Logic. Indian Contributions in Statistics: P. C. Mahalanobis, C. Radhakrishna Rao, Samanta Chandra Sekhar Harichandan, J. K. Ghose, P. Maiti. <i>Suggested Activities: Decoding Ancient Logic, Statistical Legends: A Tribute to Indian Pioneers, Logic Meets Statistics: A Fun Debate.</i>	05
II	Determinants: Basic Properties of Determinants, Minor determinant, Cofactors, Applications of determinants in finding the area of a triangle. Matrices: Concept of Matrices, Notation, order and equality of Matrices, Types of Matrices, Operations on Matrices, Addition and multiplication, Multiplication with a scalar, Simple properties of addition, multiplication and scalar multiplication, Transpose of a Matrix, Application of Matrices to solve real world problems. <i>Suggested Activities: Applications of Matrices to solve the problems related to Industries, Business, Economics and real-world problems.</i>	15
III	Frequency distribution, Measures of central tendency: Mean, Median, Mode. Measure of dispersion: mean deviation, variance and standard deviation of ungrouped/grouped data. <i>Suggested Activities: Applications of Mean, Median, Mode, mean deviation, variance and standard deviation to solve the problems related to Industries, Business, Economics and real-world problems</i>	20
IV	Mathematical Logic: Statements and notations, Propositions and Truth table, Negation, Conjunction and Disjunction, Implications and Double implication, Bi-conditional propositions, Contrapositive Implication and converse, Contrapositive and inverse propositions, Tautology and Contradiction, Logical equivalences, De-Morgan Law. <i>Suggested Activities: Applications of Mathematical Logic to solve the problems related to Industries, Business, Economics and real-world problems</i>	20

Note – Individual passing marks are required in External, Internal, and Practical.

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PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Textbooks:

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2. Udayan S. Patankar & Sunil M. Patankar: Elements of Vedic Mathematics, TTU Press, Tallinn 2018.
3. Nita H. Shah, Forum A. Thakkar: Matrix and Determinant Fundamentals and Applications, CRC Press, 2020.
4. H. C. Saxena and J. N. Kapoor: Mathematical Statistics, S. Chand and Company, 2010.
5. R. M. Somasundaram: Discrete Mathematical Structures, PHI Learning Pvt. Ltd., 2003.
6. Fundamental Mathematics (Volume- I) by Dr. Prafull Chhabra : For students of BBA, BCA, B. Tech. and competitive examinations , September 2023
7. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें।

Reference Books:

8. Hari Kishan: A Textbook of Matrices, Atlantic Publishers & Dist., 2008
9. Shanti Narayan and P K Mittal: A Textbook of Matrices, S. Chand Publishing, 1953.
10. E. Rukmangadachari: Probability and Statistics, Pearson Education India; First edition, 2012.
11. R. P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.:

Suggested Readings:

Suggested Digital Platforms & Web links:

1. <https://www.eshiksha.mp.gov.in/mpdhe>
2. <https://epgp.inflibnet.ac.in>

Suggested equivalent online courses:

1. <https://nptel.ac.in/courses/111106112/>
2. <https://nptel.ac.in/courses/111105090/>
3. <https://nptel.ac.in/courses/1081041577>.

Handwritten signatures and initials:
A. A. S. Pass, G. T. Ghosh, Anon, Anurag, P. S., P. S., P. S., P. S., P. S., P. S.



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Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE): 30 Marks
Autonomous Exam (AE) : 70 Marks

Internal Assessment:		Total Marks: 30
Continuous Comprehensive Evaluation (CCE)	Class Test /Assignment Presentation/ Quiz / Peer Teaching	
External Assessment:		Total Marks: 70
Autonomous Exam Section Time: 03.00 Hours	Section (A) : Multiple Choice Questions Section (B) : Short Questions Section (C) : Long Questions	

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A.S. Jai Shachy Pass GT a Abor
Anita Q.S. P.S. Shukla U.S.



St. Paul Institute of Professional Studies, Indore
 An Autonomous Institute Affiliated to Devi Ahilya Vishwavidhyalaya, Indore
 Accredited by NAAC with 'A' Grade
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PART A: Introduction

Program: Certificate		Class: B.C.A.	Year: I Year	Session: 2025-26
Subject: Computer Applications				
1.	Course Code	BC-S105T		
2.	Course Title	Operating System (Theory)		
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Minor II		
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of computers.		
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to do the following: - <ol style="list-style-type: none"> Explain the fundamental concepts, objectives, and evolution of modern operating systems, including their role in managing computer system resources. Analyze process management, scheduling algorithms, multithreading, memory management techniques, and deadlock handling to optimize system performance. Demonstrate understanding of file systems, disk space management, and operating system security mechanisms to ensure efficient and secure system operations. Operate and administer Linux-based systems using shell programming, and explore the Android operating system architecture and its application framework. 		
6.	Credit Value	Theory – 3 Credits		
7.	Total Marks	Max. Marks : 30 + 70	Min. Passing Marks: 35	

PART B: Content of the Course

Total No. of Lectures: **45**

Module	Topics	No. of Lectures
I	Indian Knowledge System: The BOSS operating system, open source softwares, growth of LINUX, Aryabhata Linux, contributions of innovators – Rajen Sheth, Sunder Pichai etc. <i>Suggested Activities: Aryabhata Linux Coding Sprint, Open-Source Innovation Hackathon</i>	02

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 As of BOSS / BOSS / BOSS
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IV	<p>LINUX: Introduction, History and features of Linux, advantages, hardware requirements for installation, Linux architecture, file system of Linux - boot block, super block, inode table, data blocks.</p> <p>Linux standard directories, Linux kernel, Partitioning the hard drive for Linux, installing the Linux system, system - startup and shut-down process, in it and run levels. Process, Swap, Partition, fdisk, checking disk free spaces. Difference between CLI OS & GUI OS, Windows v/s Linux, Importance of Linux Kernel, Files and Directories. Concept of Open-Source Software.</p> <p><i>Suggested Activities: Linux OS Architecture Poster, Linux System Installation Lab, Linux File System Exploration, CLI vs. GUI Challenge, Linux Kernel Deep Dive, Open-Source Software Debate.</i></p>	13
Note- Individual passing marks are required in External, Internal and Practical		

PART C: Learning Resources	
Textbooks, Reference Books, Other Resources	
<p>Suggested Readings:</p> <ol style="list-style-type: none">1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications.2. A. S. Tanenbaum, Modern Operating Systems, 5th Edition, Pearson Education. 20243. Operating System by Peterson.4. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें ।5. Operating System-2nd Edition by Vijay Shukla, S. Kataria & sons, 2023	
<p>Reference Books</p> <ol style="list-style-type: none">1. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education.2. W. Stallings, Operating Systems, Internals & Design Principles, 8th Edition, Pearson Education.3. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill.	

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4. Operating System design and Concepts by Milan Milenkovic

- Suggested Readings:**
- Suggested Digital Platforms & Web links:**
1. <https://www.eshiksha.mp.gov.in/mpdhe>
 2. <https://epgp.inflibnet.ac.in>
 3. <https://nptel.ac.in/courses/106/102/106102132/>

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:		
Maximum Marks:	100	
Continuous Comprehensive Evaluation (CCE):	30 Marks	
Autonomous Exam (AE):	70 Marks	
Internal Assessment:	Class Test /Assignment Presentation/ Quiz / Peer Teaching	Total Marks: 30
Continuous Comprehensive Evaluation (CCE)		
External Assessment:	Section (A) : Multiple Choice Questions Section (B) : Short Questions Section (C) : Long Questions	Total Marks: 70
Autonomous Exam Section Time: 03.00 Hours		

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PART A: Introduction

Program: Certificate		Class: B.C.A.	Year: I Year	Session: 2025-26
Subject: Computer Applications				
1.	Course Code	BC-S105P		
2.	Course Title	Operating System (Practical)		
3.	Course Type (Core Course/DSE/Minor/MD-ID/SEC/VOC)	Minor – II		
4.	Pre-Requisite (if any)	To study this course, a student must have basic knowledge of Computers.		
5.	Course Learning Outcomes(CLO)	After the completion of this course, a successful student will be able to do the following: <ol style="list-style-type: none"> 1. Operate the Linux system. 2. Do administration 3. Do Shell programming 		
6.	Credit Value	Practical - 1 Credits		
7.	Total Marks	Max. Marks: 100	Min. Passing Marks: 35	

PART B: Content of the Course

Total No. of Labs: 30

Suggestive list of Practical's	No. of Labs.
<ol style="list-style-type: none"> 1. Linux Directory Commands: pwd, mkdir, rm -rf, ls, cd, cd /, cd ~ 2. Linux File Commands: touch, cat, cat >, cat >>, rm, cp, mv, rename 3. Linux Permission Commands: su, id, useradd, passwd, groupadd, chmod, groupdel, chown, chgrp 4. Linux File Content & Filter Commands: head, tail, tac, more, less, grep, cat, cut, grep, comm, sed, tee, tr, uniq, wc, od, sort, diff. 5. Linux Utility Commands: find, bc, locate, date, cal, sleep, time, df, mount, exit, clear, gzip, gunzip. 6. Linux Networking Commands: ip, ssh, mail, ping, host 7. Edit Crontab file: to wall message on system on particular time automatically. 8. Vi editor: Create file, edit, save and quit. Highlighting the searched term within a file. cut, yank, undo. 	30

Dr. Shachi BSS *Dr. Anamika* *Dr. ...*
Dr. ... *Dr. ...* *Dr. ...*



PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings: Textbooks: 1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications. 2. A.S. Tanenbaum. Modern Operating Systems, 3rd Edition, Pearson Education. 3. Operating System by Peterson. 4. मध्य प्रदेश हिन्दी ग्रंथ अकादमी की पुस्तकें । Reference Books: 1. G. Nutt, Operating Systems: A Modern Perspective. 2nd Edition Pearson Education. 2. W. Stallings, Operating Systems, Internals & Design Principles, 8th Edition, Pearson Education. 3. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill. 4. Operating System design and Concepts by Milan Milenkovic.
Suggested Digital Platforms Web links: https://www.eshiksha.mp.gov.in/mpdhe https://epgp.inflibnet.ac.in
Suggested equivalent online courses https://nptel.ac.in/courses/106/102/106102132/

PART D: Assessment and Evaluation	
Suggested Continuous Evaluation Methods:	
Internal Assessment	External Assessment
Class Interaction/Quiz	Viva voce practical
Attendance	Practical record file
Assignments (Charts/ Model/Seminar/Rural Services/ Technology Dissemination/Report of Excursion/Lab visit/ Survey/Industrial Visit)	Table work/Experiment
Total	100

Jas
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