ST. PAUL INSTITUTE OF PROFESSIONAL STUDIES
Autonomous College Accredited with NAAC 'A' Grade

Department of Science & Computer Science – BCA I Year

S. No.	Course Title	Course Type
1.	Computer Fundamental Organization Architecture	Major
2.	Prog. Meth. & Data Structure	Major
3.	Operating System	Minor
4.	Multimedia and Animation	Elective
5.	Data Analysis & Visualization through spreadsheet	Elective
6.	Web Designing	Vocational
7.	Digital Marketing	Vocational
8.	Basics of Computer Science	Bridge Course
9.	Digital Graphics and Visuals	Value Added Certificate
10.	Marketing in the Digital Age	Value Added Certificate
11.	AI: Tools and Applications	Value Added Certificate
12.	Advanced Skills and Functions	Value Added Certificate
13.	Developing Websites with HTML & CSS	Value Added Certificate

St. Paul Institute of Professional Studies, Indore

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Phone No. 0731-2499911, 49661355, 4961356
E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

PART A: Introduction

Program: Certificate/Diploma/Degree	Class: B.C.A. I Year - Semester I		Session: 2025-26
Subject: Computers			
1.	Course Code		BC-101T-S
2.	Course Title		Computer Fundamentals, Organization and Architecture
3.	Course Type (Core Course/Elective Generic Elective/ Vocational)		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: • Understand the basic structure, operation and characteristics of digital computer. • Design simple combinational digital circuits based on given parameters. • Understand the working of arithmetic and logic unit. • Know about hierarchical memory system including cache memories and virtual memory. • Know the contributions of Indians in the field of computer architecture and related technologies
6.	Credit Value		Theory-4 Credits Practical-2 Credits
7.	Total Marks		Max Marks: 30+70	Min. Passing Marks: 35

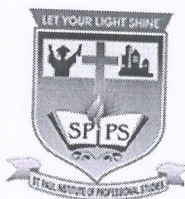| PART B: Content of the Course		
No. of Lectures (in hours per week): **4 Hrs. per week**		
Total No. of Lectures: **60 Hrs.**		
Module	Topics	No. of Lectures
I	**Fundamentals of computers:** Definition, Characteristics, capabilities and limitations. **Types of Computers:** Analog, Digital, Micro, Mini, Mainframe & Super Computers, Work Station, Server computers. Generations of Computers. **Smart Systems:** definition, characteristics and applications. Definition of Embedded system, GIS, GPS, Cloud Computing. Uses of computers in e-governance and various public domains and services.	12
II	Block diagram of computer and its functional units. Concept of hardware, software and firmware. Types of software. **Input devices:** keyboard, scanner, mouse, light pen, bar code reader, OMR, OCR, MICR, track ball, joystick, touch screen camera, mic etc. **Output devices:** monitors classification of monitors based on technology -CRT & flat panel, LCD, LED monitors, speakers, printers- dot matrix printer, ink jet printer, laser printer, 3D Printers, Wi-Fi enabled printers, plotters and their types, LCD/LED projectors. **Computer memory and its types, Storage devices:** Magnetic tapes, Floppy Disks, Hard Disks, Compact Disc - CD-ROM, CD-RW, VCD, DVD, DVD-RW, USB drives, Blue Ray Disc, SD/MMC Memory cards.	12
III	**Fundamentals of Digital Electronics:** Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Binary and other Codes, Error Detection Codes. Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Sequential Circuits, simple combinational circuit design problems. **Combinational Circuits -** Adder- Subtractor, Multiplexer, Demultiplexer, Decoders, Encoders **Sequential Circuits -** Flip-Flops, Registers, Counters.	12

|		
IV	**Basic Computer Organization:** Instruction codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycles, Memory Reference Instruction, Input-Output & Interrupts Instruction formats, Addressing modes, Instruction codes, Machine language, Assembly language. **Register Transfer and Micro operations:** Register Transfer Language, Register Transfer, Bus & Memory Transfer, Arithmetic Micro- operations, Logic Micro-operations, Shift Micro-operations. **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.	12
V	**Pipelining:** concept of pipelining, introduction to Pipelined data path and control- Handling Data hazards & Control hazards. **Memory and I/O Systems -** Peripheral Devices, I/O Interface, **Data Transfer Schemes -** Program Control, Interrupt, DMA Transfer. I/O Processor. **Memory Hierarchy:** Processor vs. Memory Speed, High-Speed Memories, Main memory & its types, Auxiliary memory, Cache Memory, Associative Memory, Interleaving, concept of Virtual Memory, Hardware support for Memory Management. **Application Software :** Types , Database,Graphics , Education , Entertainment Software, Mobile App Software, Social Media Software : Instant messaging, Email , Chatbot, Web Blogs. Free Open Source Software (FOSS). **Application Software uses :** Word Processing , Spreadsheet, Presentation, Database,designing, Recording sound and video, newsletter , posters,websites, multimedia presentation, audio, video, media steaming and E-publications, blog, forum ,Wiki , Social networking. **Using Office tools :** MS Office Tools	12
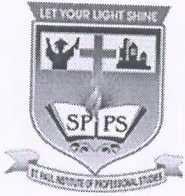
PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings
Textbooks:
1. M. Moria Mano, "Computer System Architecture", PHI 2. Heuring Jordan, "Computer System Design & Architecture" (A.W.L.) 3. मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तक
Reference Books:
4. William Stalling. "Computer Organization & Architecture", Pearson Education Asia 5. V. Carl Hamacher, "Computer Organization", TMH 6. Tannenbaum, "Structured Computer Organization", PHI 7. Er. Rajiv Chopra, "Computer Architecture". Revised 3rd Edition, S. Chand & Company Pvt. Ltd
Suggestive digital platform web links
https://www.youtube.com/watch?v=4TzMyXmzL8M https://nptel.ac.in/courses/106/106/106106166/ https://nptel.ac.in/courses/106/106/106106134/
Suggested equivalent online courses
https://nptel.ac.in/courses/106/105/106105163/

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):30	Class Test Assignment/Presentation E-quiz	30
External Assessment: University Exam Section: 70 Time : 03.00 Hours	**Section(A) : Six Very Short Questions**	06 x 01 = 06
	Section (B) : Five Short Questions	05 x 08 = 40
	Section (C) : Two Long Questions	02 x 12 = 24 Total 70

PART A: Introduction

Program: Certificate/Diploma/Degree	Class: B.C.A. I Year – Semester I		Session: 2025-26
Subject: Computers			
1.	Course Code		BC-101P-S
2.	Course Title		Computer Fundamentals and Digital Lab
3.	Course Type (Core Course/Elective Generic Elective/ Vocational)		Core Course
4.	Pre-Requisite (if any)		Open for All
5.	Course Learning Outcomes (CLO)		After the completion of this course, a successful student will be able to do the following: • Familiarity with parts of the computer and peripheral devices used with the computer. • Realization of the basic logic and universal gates. • Verify the behavior of logic gates using truth tables. • Implement Binary-to-Gray, Gray-to-Binary code conversions. • Design half and full adder circuit using basic gates. • Design and construct flip flops and verify the excitation tables.
6.	Credit Value		Practical - 2 Credits
7.	Total Marks		Max Marks: 30+70	Min. Passing Marks: 35

PART B: Content of the Course

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

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

Suggestive list of Practicals	No. of Labs
I. Computer Fundamentals a) Identity various parts of the computer by physical examination. b) Identify various parts inside the CPU like motherboard, SMPS, ports, buses, IC chips, Processor, HDD, RAM etc. c) Identify various I/O devices available in the lab physically. II. Digital Electronics a) Verification and interpretation of truth table for AND, OR, NOT gates b) Verification and interpretation of truth table for NAND, NOR gates c) Verification and interpretation of truth table for Ex-OR, Ex-NOR d) Study of half adder using XOR and NAND gates and verification of its operation	30

e) Study of full adder using XOR and NAND gates and verification of its operation

f) Study of half subtractor and verification of its operation

g) Study of full subtractor and verification of its operation

h) Realization of logic functions with the help of NAND-Universal Gates

i) Realization of logic functions with the help of NOR -Universal Gates

j) Verify the truth table of RSflip-flops using NAND and NOR gates

k) Verify the truth table of JKflip-flops using NAND and NOR gates

l) Verify the truth table of T and D flip-flops using NAND and NOR gates

m) Implementation of 4x1 multiplexer using logic gates

n) Implementation of 1x4 demultiplexer using logic gates

o) Verify Gray to Binary conversion using NAND gates only

p) Verify Binary to Gray conversion using NAND gates only

q) MS office Tools Practicals are below:

USING Text Editor Tool:

1. Create a document and apply different Editing options.
2. Create Banner for your college.
3. Design a Greeting Card using Word Art for different festivals.
4. Design your Bio data and use page borders and shading.
5. Create a document and insert header and footer, page title, date, time, apply   various page formatting features etc.
6. Implement Mail Merge.
7. Insert a table into a document and try different formatting options for the table

Using a Spreadsheet Tool

1. Design your class Time Table.
2. Prepare a Mark Sheet of your class result.
3. Prepare a Salary Slip of an employee of an organization.
4. Prepare a bar chart & pie chart for analysis of Election Results.
5. Prepare a generic Bill of a Super Market.
6. Work on the following exercises on a Workbook:
    a. Copy an existing Sheet
    b. Rename the old Sheet
    c. Insert a new Sheet into an existing Workbook
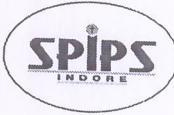   d. Delete the renamed Sheet
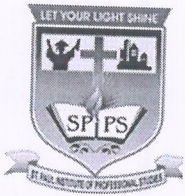
7. Prepare an Attendance sheet of 10 students for any 6 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student & average of attendance.
8. Create a worksheet of Students list of any 4 faculties and perform following database functions on it.
   a. Sort data by Name
   b. Filter data by Class
   c. Subtotal of no. of students by Class.

Using a Presentation Tools

1. Design a presentation of your institute using auto content wizard, design template and blank presentation.
2. Design a presentation illustrating insertion of pictures, Word Art and ClipArt.
3. Design a presentation, learn how to save it in different formats, copying and opening an existing presentation.
4. Design a presentation illustrating insertion of movie, animation and sound.
5. Illustrate use of custom animation and slide transition (usin(2, different effects).
6. Design a presentation using charts and tables of the marks obtained in class

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Textbooks:

- M. Moria Mano, "Computer System Architecture", PHI
- Heuring Jordan, "Computer System Design & Architecture" (A.W.L.)
- मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तक

Reference Books:

- William Stalling. "Computer Organization & Architecture", Pearson Education Asia
- V. Carl Hamacher, "Computer Organization", TMH
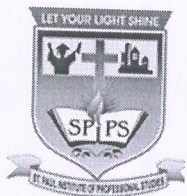- Tannenbaum, "Structured Computer Organization", PHI

Suggestive digital platform web links

https://de-iitr.vlabs.ac.in/

Suggested equivalent online courses

https://nptel.ac.in/courses/106/105/106105163/

PART D: Assessment and Evaluation

Internal Assessment: Continuous Comprehensive Evaluation (CCE): 30 Marks		External Assessment: University Exam (UE) – 70 Marks Time: 02.00 Hours	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	10 Marks	Practical record file	10 Marks
Viva	5 Marks	Viva voce practical	20 Marks
Lab Test from practical list	7 Marks	Table works/ Exercise Assigned (02) in practical exam	30 Marks
Assignments (Charts/ Models) Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	8 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	10 Marks
Total *Excursion/ Lab visits/ Industrial Training is compulsory	**30 Marks**	Total	**70 Marks**

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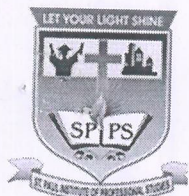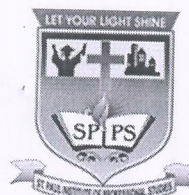E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

PART A- Introduction

Program: Certificate/Diploma/Degree		Class: BCA I Year- Semester II	Session:2025-26
Subject: Computer Science			
1	Course Code	BC-102T-S	
2	Course Title	Programming Methodology & Data Structures	
3	Course Type	Core Course	
4	Pre-Requisite	To study this course, a student must have basic knowledge of Computers	
5	Course Learning Outcomes	**After the completion of this course, a successful student will be able to do the following:** • Develop simple algorithms and flow charts to solve a problem with programming using top-down design principles. • Learn to formulate iterative solutions and array processing algorithms for problems. • Use recursive techniques, pointers and searching methods in programming. • Will be familiar with fundamental data structures, their implementation; become accustomed to the description of algorithms in both functional and procedural styles. • Have knowledge of complexity of basic operations like insert, delete, search on these data structures. • Possess ability to choose a data structure to suitably model any data used in computer applications. • Assess efficiency tradeoffs among different data structure implementations. • Implement and know the applications of algorithms for searching and sorting. • Know the contributions of Indians in the field of programming and data structures.	
7	Credit value	Theory – 4 Credits Practical – 2 Credits	
8	Total Marks	Max. Marks: 30+70 Min. Passing Marks: 35	

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PART B- Content of the Course

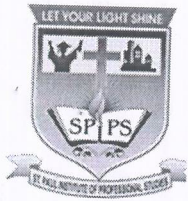**Total no. of Lectures (in hours per week): -4 Hrs. Per week**   **Total Lectures: -60**

Unit	Topic	No. of Lectures
I	**Basics of C++:** Program Concepts, 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 Operators. **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. **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.	14
II	**Constructor & Destructor:** Constructor, Parameterized Constructor, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, DynamicConstructor and Destructor. **Inheritance:** Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance. **Polymorphism:** Virtual Base Classes, Abstract Classes, Constructor in Derived Classes, Nesting of Classes. Operator Overloading & Type Conversion. **Pointers & Streams:** Pointers with Arrays C++, Streams, C++ Stream Classes, Unformatted I/O Operation, Formatted I/O Operations, Managing Output with Manipulators, Exception Handling.	10
III	**Data Structures** - Basic concepts, Linear and Non-Linear Data Structures, Algorithm Specification-Introduction, complexity. **Arrays:** Introduction to Arrays - Declaration and Referring Arrays, Arrays in Memory, Initializing Arrays. single, two-dimensional arrays, Multi-dimensional Arrays, Arrays in function. Sparse Matrices, **Linked Lists:** Singly Linked Lists, Operations, Concatenating, circularly linked lists-Operations for Circularly linked lists, Doubly Linked Lists- Operations.	12

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IV	**Stacks-** Operations, Array and Linked Representation, Applications, Polish Notations-Infix to Postfix Conversion, Postfix Expression Evaluation, Recursion & Implementation. **Queues-** Definition, Operations, Linear Linked Implementations. Circular Queue-Insertion and Deletion Operations, Dequeue (Double Ended Queue), Priority Queue- Implementation.	10
V	**Trees & Graphs-** Representation of Trees, Binary tree, Properties, Binary Tree Representations-Array and Linked Representations, Binary Tree Traversals, Threaded Binary Trees, Binary Search Trees, AVL Trees, Heap creation. **Graphs -** Graph ADT, Graph Representations, Graph Traversals. **Sorting & Searching**: Sorting Methods: Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, Comparison of Sorting Methods **Searching Algorithms -** Linear Search, Binary Search. **Hashing-** Introduction, Hash tables, Hash functions.	14
Keywords/ Tags	Programming, C++, Data Structures, Expressions, Control, File Handling, Arrays, Stack, Queue, Linked List, Tree, Graph, Structure, Union, Hash, Search, Sort, Algorithm	

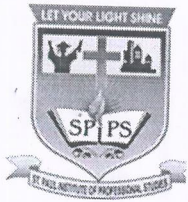## PART C- Learning Resources

Textbooks/ Reference Books:

1. J. R. Hanly and E. B. Koffman, "Problem Solving and Program Design in C", Pearson, 2015
2. E. Balguruswamy, "C++", TMH Publication ISBN 0-07-462038-X
3. Herbert Shildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
4. मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तक
5. R. Lafore, 'Object Oriented Programming C++
6. N. Dale and C. Weems, "Programming and problem solving with C++: brief edition", Jones & Bartlett Learning.
7. Adam Drozdek, "Data Structures and algorithm in C++". Third Edition, Cengage Learning.
8. Sartaj Sahani, "Data Structures, Algorithms and Applications with C++", McGraw Hill.
9. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
10. D.S. Malik, "Data Structure using C++", Second edition, Cengage Learning.
11. M. A. Weiss, "Data structures and Algorithm Analysis in C", 2nd edition, Pearson.
12. Lipschutz, "Schaum's outline series Data structures". Tata McGraw-Hill

Suggested Digital Platforms, Web Links:

1. https://www.youtube.com/watch?v=BCIS40yzssA
2. https://www.youtube.com/watch?v=yLnPwxZdW4Y&vl=en
3. https://www.youtube.com/watch?v=Umm1ZQ5ltZw

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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):30	Class Test Assignment/Presentation E-quiz	30
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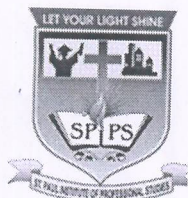Phone No. 0731-2499911, 49661355, 4961356
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PART A: Introduction		
Program: Certificate/Diploma/Degree	Class: BCA I Year- Semester II	Session:2025-26
Subject: Computer Science		
1.	Course Code	BC-102P-S
2.	Course Title	**Programming Methodology & Data Structures Lab**
3.	Course Type (Core Course/Elective Generic Elective/ Vocational)	**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. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles. 2. Writing efficient and well-structured computer algorithms/programs. 3. Learn to formulate iterative solutions and array processing algorithms for problems. 4. Use recursive techniques, pointers and searching methods in programming. 5. Possess ability to choose a data structure to suitably model any data used in computer applications. 6. Implement and know the applications of algorithms for searching and sorting etc.
6.	Credit Value	**Practical - 2 Credits**
7.	Total Marks	Max Marks: **30+70** Min. Passing Marks: **35**

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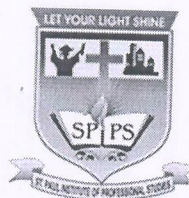
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| PART B: Content of the Course	
No. of Lectures (in hours per week): **2 Hrs. per week**	
Total No. of Lectures: **30 Hrs.**	
Suggestive list of Practical	No. of Labs

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:**
 	
 1.   Write a program to swap the contents of two variables.
 2.   Write a program for finding the roots of a Quadratic Equation.
 3.   Write a program to find area of a circle, rectangle, square using switch case.
 4.   Write a program to print table of any number.
 5.   Write a program to print Fibonacci series.
 6.   Write a program to find factorial of a given number using recursion.
 7.   Write a program to convert decimal (integer) number into equivalent binary number.
 8.   Write a program to check given string is palindrome or not.
 9.   Write a program to print digits of entered number in reverse order.
 10.   Write a program to print sum of two matrices.
 11.   Write a program to print multiplication of two matrices.
 12.   Write a program to generate even/odd series from 1 to 100.
 13.   Write a program whether a given number is prime or not.
 14.   Write a program for call by value and call by reference.
 15.   Write a program to create a pyramid structure
         1
         12
         123
         1234
 16.   Write a program to check entered number is Armstrong or not.
 17.   Write a program to input N numbers and find their average.
 18.   Write a program to find the area and volume of a rectangular box using constructor.
 19.   Write a program to design a class time with hours, minutes and
	30
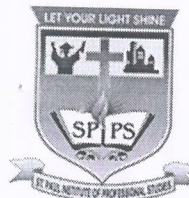
	seconds as data members. Use a data function to perform the addition of two times objects in hours, minutes and seconds.
20.	Write a program to implement single inheritance.
21.	Write a program to find largest element from an array.
22.	Write a program to implement push and pop operations on a stack using array.
23.	Write a program to perform insert and delete operations on a queue using array.
24.	Write a program for Linear search.
25.	Write a program for Binary search.
26.	Write a program for Bubble sort.
27.	Write a program for Selection sort.
28.	Write a program for Quick sort.
29.	Write a program for Insertion sort.
30.	Write a program to implement linked list.

Part C

Suggested Readings: Textbooks, Reference Books, Other Resources:

1. J. R. Hanly and E. B. Koffman, "Problem Solving and Program Design in C", Pearson, 2015
2. E. Balguruswamy, "C++", TMH Publication ISBN 0-07-462038-X
3. Herbert Shildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
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10. D.S. Malik, "Data Structure using C++", Second edition, Cengage Learning.
11. M. A. Weiss, "Data structures and Algorithm Analysis in C", 2nd edition, Pearson.
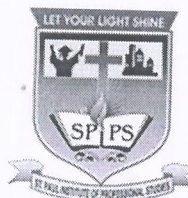12. Lipschutz, "Schaum's outline series Data structures". Tata McGraw-Hill

Suggestive digital platform web links:
1. https://www.youtube.com/watch?v=BCIS40yzssA
2. https://www.youtube.com/watch?v=yLnPwxZdW4Y&vl=en
3. https://www.youtube.com/watch?v=Umm1ZQ5ltZw

Suggested equivalent online courses

St. Paul Institute of Professional Studies, Indore

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Accredited by NAAC with 'A' Grade
Phone No. 0731-2499911, 49661355, 4961356
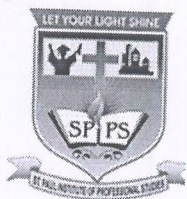E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

S. No.	Online Course	Duration	Platform
1.	Programming in C++ https://nptel.ac.in/courses/106/105/106105151/	8 weeks	NPTEL
2.	Beginning C++ Programming- From Beginner to Beyond https://www.udemy.com/course/beginning-c-plus-plus-programming/'	Self placed	Udemy

PART D: Assessment and Evaluation			
Internal Assessment: Continuous Comprehensive Evaluation (CCE): **30 Marks**		**External Assessment:** University Exam (UE) – **70 Marks** Time: **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	10 Marks	Practical record file	10 Marks
Mock Viva	5 Marks	Viva voce practical	20 Marks
Lab Test from practical list	7 Marks	Table works/ Exercise Assigned (02) in practical exam	30 Marks
Assignments (Charts/ Models) Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	8 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	10 Marks
Total ***Excursion/ Lab visits/ Industrial Training is compulsory**	**30 Marks**	Total	**70 Marks**

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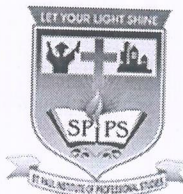E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

PART A: Introduction		
Program: Certificate/Diploma/Degree	**Class: BCA I Year- Semester I**	**Session:2025-26**
Subject: Computer Science		
1.	Course Code	
2.	Course Title	BC-103T-S
		Operating System
3.	Course Type (Core Course/Elective Generic Elective/ Vocational)	Minor
4.	Pre-Requisite (if any)	Open for all
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to: - Describe the importance of computer system sources and the role of operating system in their management policies and algorithm. - Specify objectives of modem operating systems and describe how operating systems have evolved over time. - Understand various process management concepts and can compare various scheduling techniques, synchronization, and deadlocks - Describe the concepts of memory management techniques - Identify the best suited process management technique for any process. - Describe various file operations, file allocation methods and disc space management. - To understand and identify potential threat to operating systems and the security features to guard against them. - Learn to operate the Linux system
6.	Credit Value	Theory-4 Credits Practical-2 Credits
7.	Total Marks	Max Marks: **30+70** Min. Passing Marks: **35**

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Module	PART B: Content of the Course	
	No. of Lectures (in hours per week): **4 Hrs. per week**	
	Total No. of Lectures: **60 Hrs.**	
	Topics	**No. of Lectures**
I	**Introduction to Operating System:** Basic OS functions, Resource Abstraction. Types of Operating Systems - Batch Systems, Multiprogramming Systems, Multiprocessing Systems, Time Sharing Systems, Distributed OS, Real Time Systems. Applications of OS. Some prevalent operating systems - Windows, UNIX/Linux, Android, MacOS, Blackberry OS, Symbian, Bada etc. **Process Management:** Process Concepts, Process States & Process Control Block. **Process Scheduling:** Scheduling Criteria. Scheduling Algorithms (Preemptive & Non - Preemptive) FCFS, SJF, SRTN, RR Priority, Multiple-Processor, Real-Time, Multilevel Queue & Multilevel Feedback Queue Scheduling.	10
II	**Deadlock-**Definition, Deadlock Characterization, Conditions for Deadlock. **Deadlock Handling Approaches:** Prevention, Avoidance. Detection and Recovery. **Memory Management:** Introduction, Address finding, Logical versus Physical Address Space, Swapping Contiguous & Non-Contiguous Allocation, Fragmentation (Internal & External), Compaction, Paging. Segmentation, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms.	14
III	**File Management:** Concept of File System (File Attributes, Operations, Types) Functions of File System, Types of File System, Access Methods (Sequential, Direct & other methods), Directory Structure (Single-Level, Two-Level, Tree-Structured, Acyclic-Graph, General Graph), Allocation Methods - Contiguous, Linked, Indexed. **Disk Management:** Structure, Disk Scheduling Algorithms (FCFS, SSTF, SCAN, C-SCAN, LOOK), Swap Space Management, Disk Reliability, Recovery. **Security:** Security Threats, Security policy mechanism, Protection, Trusted Systems, Authentication and Internal Access Authorization, Windows Security.	12
IV	**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. Linux Standard Directories, Linux Kernel, Partitioning the hand drive for Linux, Installing the Linux System, System- Startup and Shut-down Process, init and run levels. Process, Swap, Partition, fdisk, Checking Disk Free Spaces. Difference between CLI OS & GUI OS, Windows v/s Linux, Linux Kernel, Files and Directories. Concept of Open Source Software.	10
V	**System Programming Language:** Basic fundamentals of Programming, Algorithms, Flowcharts, Data types & Operators, Flow Control Structure, Iterations. **Indian Contribution to the field:** Aryabhatt Linux, Contribution of innovators- Rajen Sheth, Sundar Pichai etc.	14

Keywords / Tags :	Process, Deadlock, File Management, Disk Management, Kernel, Shell

PART C- Learning Resources

Textbooks, Reference Books, Other Resources

Textbooks:

- Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications
- AS. Tuneshaum, Modern Operating Systems, 3rd Edition, Pearson Education.
- Operating System by Peterson
- Linux by Sumitabh Das
- मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तक

Reference Books:

- G. Nott, Operating System: A Modem Perspective, 2nd Edition Pearson Education.
- W. Stallings, Operating Systems, Internals & Design Principles, 8th Edition, Pearson Education.
- M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill
- Operating System design and Concepts by Milan Milenkovic

Suggestive digital platform, Web links:

1. https://web.iitd.ac.in/~minati/MTL458.html
2. https://www.cse.iitb.ac.in/~mythili/os/
3. https://www.youtube.com/watch?v=aCJ3YgoolHQ

Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods:
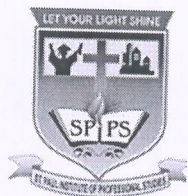
Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) 70 marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation - E-quiz	30
External Assessment: University Exam Section: 70 Time : 03.00 Hours	Section(A) : Six Objective Questions	06 x 01 = 06
	Section (B) : Five Short Questions	05 x 08 = 40
	Section (C) : Two Long Questions	02 x 12 = 24
		Total 70

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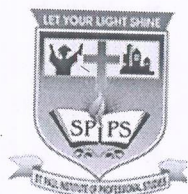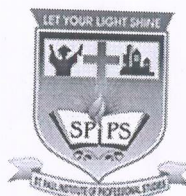E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

PART A: Introduction			
Program: Certificate/Diploma/Degree	Class: BCA I Year- Semester I		Session:2025-26
Subject: Computer Science			
1.	Course Code	BC-103P-S	
2.	Course Title	Operating System Lab	
3.	Course Type (Core Course/Elective Generic Elective/ Vocational)	Minor	
4.	Pre-Requisite (if any)	Open for all	
5.	Course Learning Outcomes (CLO)	After the completion of this course, a successful student will be able to: - Operate the Linux System. - Do administration - Use Vi Editor - Understand basic programming using C++.	
6.	Credit Value	Practical - 2 Credits	
7.	Total Marks	Max Marks: 30+70	Min. Passing Marks: 35

PPRACTICALS : PART B: Content of the Course No. of Lectures (in hours per week): 1 Hr.per week **Total No. of Lectures: 30** **Suggestive list of Practicals**	No. of Labs
DOS: a) External Commands b) Internal Commands	30

Linux:

a) Linux Directory Commands: pwd, mkdir, rm-rf, ls, cd, cd/, cd~

b) Linux File Commands: touch, cat, cat >, cat >>, rm, cp, mv, rename

c) Linus Permission Commands: su, id, useradd, passwd, groupadd, chmod, groupdel, chown, chgrp

d) Linus File Content & Filter Commands: head, tail, tac, more, less, grep, cat, cut, grep, comm, sed, tee, tr, uniq, wc, od, sort, diff

e) Linux Utility Commands: find, be, locate, date, cal, sleep, time, df, mount, exit, clear, gzip, gunzip

f) Linux Networking Commands: ip, ssh, mail, ping, host

g) Edit Crontab file: to wall message on system on particular time automatically.

h) Vi Editor: Create file, edit, save , quit. Highligting the searched term within a file, cut, yank, undo.

C++ Programs:

a) Program to add/subtract/multiply/divide two and more numbers

b) Program to check if a number is even/odd and prime/composite

c) Program to swap two numbers using/without using a third variable

d) Program to find the largest/smallest number among three numbers

e) Program to compute the given power of a number

f) Program demonstrating basic nested if-else conditions

g) Program demonstrating loops

PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings
Textbooks: • Linux by Sumitabh Das • Linux Bible • मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तक
Suggestive digital platform web links https://web.iitd.ac.in/~minati/MTL458.html https://www.cse.iitb.ac.in/~mythili/os/ https://www.youtube.com/watch?v=aCJ3YgoolHQ
Suggested equivalent online courses https://nptel.ac.in/courses/106/102/106102132/ https://www.youtube.com/watch?v=OHCMfsNpqCc

PART D: Assessment and Evaluation

Internal Assessment: Continuous Comprehensive Evaluation (CCE): 30 Marks		External Assessment: University Exam (UE) – 70 Marks Time: **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	10 Marks	Practical record file	10 Marks
Mock Viva	5 Marks	Viva voce practical	20 Marks
Lab Test from practical list	7 Marks	Table works/ Exercise Assigned (02) in practical exam	30 Marks
Assignments (Charts/ Models) Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	8 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	10 Marks
Total *Excursion/ Lab visits/ Industrial Training is compulsory	**30 Marks**	Total	**70 Marks**

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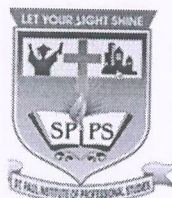E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

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INDORE

PART A: Introduction		
Program: Certificate	**Class: I Year – Semester II**	**Session: 2025-2026**
Subject: Multimedia & Animation		
1. Course Code	EL-105T-S	
2. Course Title	**Multimedia & Animation**	
3. Course Type (Core Course/Elective/Generic Elective/ Vocational	**Elective**	
4. Pre-Requisite (if any)	To study this course, a student must have prior basic knowledge of using computer and internet. This course is open for all.	
5. Course Learning Outcomes(CLO)	**On completion of this course, learners will be able to:** 1. Gain a deep understanding of animation principles and techniques, character motion graphics. 2. Students will be able to find jobs in various fields. 3. Develop skills in utilizing multimedia software such as Adobe Creative Suite to create engaging visual content.	
6. Credit Value	4 Theory + 2 Practical	
7. Total Marks	Max. Marks: **30+70**	Min. Passing Marks: 35

Unit	Topics	No. of Lectures
PART B: Content of the Course	

	PART B: Content of the Course	
	No. of Lectures (in hours per week): 4 Hr. per week	
	Total No. of Lectures: 60 Hrs.	
Unit	**Topics**	**No. of Lectures**
I	**Introduction to Multimedia:** What is multimedia. Multimedia and Hypermedia, Components of multimedia -textual, images, graphics, animation. audio and video. Linear and Non-Linear Multimedia, Application of Multimedia, Requirement of Multimedia System. **Multimedia Authoring Tools :** Multimedia Authoring. Multimedia Authoring Metaphors, Multimedia Production. Multimedia Presentation and tools. Automatic Authoring. Editing and Authoring Tools. Multimedia Hardware. Compression & Decompression.	12
II	**Fonts and Hypertext:** Usage of text in Multimedia, Families and faces of fonts. outline fonts. bltmap fonts. International character sets and hypertext. Digital font's techniques. **Image fundamentals:** Image formats, Bitmap and Vector. Color Models, Color palettes, 2D Graphics, lmage Compression and File Formats : GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS. PDF, Basic lmage Processing. Use of image editing software, Photo Retouching. Image resolution. Colour. Raster and Vector Graphics.	12
III	**Audio fundamentals:** Audio quality, fomiats and devices, Digitization of sound. frequency and bandwidth, decibel system. data rate, audio file format, Sound synthesis. Musical Instrument Digital Interface (MIDI), wavetable. Compression and transmission of audio on Internet, Editing and adding sound to multimedia project, Audio software and hardware. **Video Fundamental:** Video basics. Formats. how video works. Types of video signals - component. composite and S-video. Analog video, Digital video, Broadcast Video Standards (NTSC, PAL), Video Recording and Tape formats. Shooting and editing Video, Video compression and File formats (JPEG.MPEG), Video software and hardware.	12
IV	**Animation:** Introduction and definition of animation, Principles. Types and uses. Methods and Techniques of animation, Basic animation, Text and image animation. Time line construction and management. Masking Motion and shape Tweening. Morphing, Onion skinning. Animation File Formats. Keyfranie animation, Working with symbols and Animation Software.	12
V	**Basic 2D and 3D animation:** Overview of 2D animation and its features, Drawing tools. types of panels. transformation, property panel. working with objects. group, bitmap. Controlling Movie clips with code. Working with Dynamic Text fields and Input Text Fields. Loading external content and other movies. Dynamic preloaders. Interactivity with code. Difference between 2D and 3D animation, Tweening and motion along a path, Controlling movie playback. Text and hyperlink. adding sound and movie. Introduction to 3D animation and its basic concepts, and its applications.	12
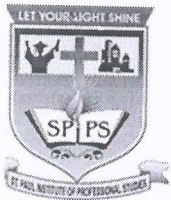
Keywords/Tags: Multimedia. Hardware, Software, Images, GIF. JPEG, JPEG 2000, PNG. TIFF, EXIF. PS. PDF, Video, Compression. Animation. Tweening, Morphing, controlling movie clips, transformation. 2D. 3D, MIDI. file formats.

PART C: Learning Resources

Textbooks, **Reference Books,** Other Resources

Suggested Readings :

- Tay Vaughan, "Multimedia Making It Works", Tata McGraw-Hill.
- Ze-Nian Li and Mark S. Drew "Fundamentals of Multimedia" Pearson Education International.
- Rajneesh Aggarwal & B. B Tiwari, "Multimedia Systems", Excel Publication. New Delhi
- Li & Drew. "Fundamentals of Multimedia", Pearson Education.
- Parekh Ranjan, "'Principles of Multimedia", Tata McGraw-Hill.
- M.Mahalakshmi. Multimedia '. Margham Publications,
- Pakhira, Malay K,   Computer Graphics, Multimedia and Animation", Prentice Hall India Pea. Ltd.
- Liz Blazer Animated Storytelling: Simple Steps for Creating Animation and Motion Graphics."
- Andy Beane "3D Animation Essentials" John Wiley.

Suggestive digital platform web **links** :

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Subject'?catid=7 https://onlinecourses.soa›

ain2.ac.in/cec2 I_cs18_pre› ie

https://onlinecorirses.seasarn2.ac. iii/wori21_cs04/preview

Suggested equivalent online courses

https://wii s .classcentra1.cont/course/sea› am-animations-13880

Part D- Assessment and Evaluation
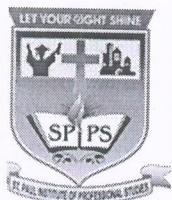
Suggested Continuous Evaluation Methods:

Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) :70 marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation E-quiz	30
External Assessment: University Exam Section: 70 Time : 03.00 Hours	Section(A) : Six Very Short Questions	06 x 01 = 06
	Section (B) : Five Short Questions	05 x 08 = 40
	Section (C) : Two Long Questions	02 x 12 = 24 Total 70

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PART A: Introduction		
Program: Certificate	Class: B.Com/BBA I Year- Semester-II	Session: 2025-2026
Subject: Computer Science		
1.	Course Code	EL-105P-S
2.	Course Title	**Multimedia & Animation Lab**
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Elective** '
4.	Pre-Requisite (if any)	To study this course. a student must have prior basic knowledge of using computer and internet. This course is open for all.
5.	Course Learning Outcomes(CLO)	• On completion of this course, learners will be able to: • Gain a deep understanding of animation principles and techniques, character motion graphics. • Students will be able to find jobs in various fields. • Develop skills in utilizing multimedia software such as Adobe Creative Suite to create engaging visual content.
6,	Credit Value	2
7.	Total Marks	Max. Marks: 30+70 Min. Passing Marks: 35

Note: In the first week of the lab, the instructor must facilitate the students with the basic operation of multimedia tools and software like Coreldraw, Photoshop, Picasa, Sound forge, Waveform Editor, Moviemaker, Dreamweaver, Macromedia Flash, 3D Max, Blender etc. or any other open source suitable multimedia tools.
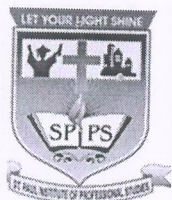
PART B: Content of the Course		
No. of Lab. Practicals (in hours per week): 2 Hrs. per week		
Total No. of Lab Hrs. 30		
	Suggestive List of Practicals	No. of Labs.
	1. Prepare a multimedia presentation	30 Hours
	2. Prepare and edit different types of images, and their conversion into other file formats.	
	3. Learning to do Image, Audio and Video file Compression.	
	4. Prepare different types of graphics.	
	5. Design multimedia posters and banners.	
	6. Morphing and Tweening of images.	
	7. Create animation of basic movements like bouncing a ball, moving a wheel, dancing a doll etc.	
	8. Apply different operations (rotation, scaling, movement etc...) on objects.	
	9. Recording of video and audio	

	10. Integration of sound files and editing	
	11. Integration of video files and editing	
	12. Prepare jingles and advertisements by applying multimedia tools.	
	13. Develop a 2D animation using shape tweening and motion tweening.	
	14. Create a 2D animation using motion guide layer and masking	
	15. Create text animation	
	16. Design simple 3D animation using basic shapes.	
	17. Develop basic 3D animation of different objects.	
	18. Create a small animated story.	

Keywords/Tags: Coreldraw, Photoshop. Picasa, Sound forge. Waveform Editor, Moviemaker. Dreamweaver, Macromedia Flash. 3D Max. Blender. Video, Compression, Animation, Tweening. Morphing. controlling movie clips, transformation, 2D, 3D. MIDI.

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings :

- Tay Vaughan. Multimedia Making It Works". Tata McGraw-Hill.
- Ze-Nian Li and Mark S. Drew 'Fundamentals of Multimedia" Pearson Education International.
- Rajneesh Aggarwal & B. B Tiwari. "Multimedia Systems", Excel Publication, New Delhi
- Li & Drew, Fundamentals of Multimedia", Pearson Education.
- Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill.
- M.Mahalakshmi, "Multimedia", Markham Publications,
- Pakhira. Malay K. "Computer Graphics. Multimedia and Animation". Prentice Hall India Pvt. Ltd.
- Liz Blazer "Animated Storytelling: Simple Steps for Creating Animation and Motion Graphics." Andy Beane "3D Animation Essentials" John Wiley.

Suggestive digital platform web links : https://epgp.inf1ibnet.ac.in/Home/ViewSiiblect'?catid=7 https://on1inecoitrses.swa›'ani2.ac.in/cec21 csI S/pres ie« https://on1inecourses.sit as ani2.ac.in/nou21 cs04/pres ieiv

Suggested equivalent online courses

https://wv w.classcentra1.cont/course/swav‹irn-animations-13880

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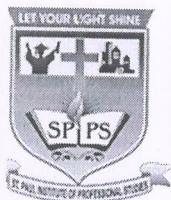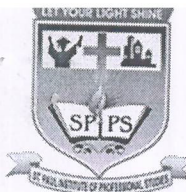E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

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PART D: Assessment and Evaluation			
Internal Assessment: Continuous Comprehensive Evaluation (CCE) : 30		External Assessment: University Exam (UE): 70 Marks Time: **02.00 Hours**	
Internal Assessment	Marks	**External Assessment**	**Marks**
Hands-on Lab Practice	5 Marks	Practical record file	10 Marks
Lab **Test** from practical list & internal viva	15 Marks	Viva voce on practical	10Marks
Assignments (Charts/ Model/ Seminar / Rural Service/ Technology/ Dissemination/	10 Marks	Table works/ Experiments	50 Marks
Total	**30 Marks**	**Total**	**70 Marks**
Any remarks/suggestions: Focus of the lab practical /course should be on developing creative designing, visualization and implementation abilities to solve real world problems.			

Part A: Introduction

Program: Certificate	Class: I Year - Semester II	Session: 2025-2026
Subject: Computer Science		

Course Code	EL-106T-S
Course Title:	Data Analysis and Visualization through spread sheets
Course Type:	Elective
Pre-requisite:	To study this course, a student must have prior basic knowledge of using computer and Internet. This course is open for all
Course Learning Outcomes	On the completion of this course learners will be able to: 1. Prepare a spreadsheet file and enter data into the sheet. 2. illustrate formatting and editing capabilities on the data. 3. demonstrate basic calculations and save data. 4. import and export data into the spreadsheet. 5. Demonstrate basic visualising, analysing, organising, and sharing techniques. 6. Do the jobs in financial as well as in other business-related industries across the globe.
Expected Job Role /career opportunities	1. Accountants and Auditors 2. Administrative Assistants, Office Clerks, and Information Staff 3. Analysts in Business, Management, and Markets 4. Cost estimators 5. Educators, Teaching Assistants, and Instructors 6. Financial Analysts, Investment Bankers, and Loan Officers 7. Analysts of Market Research and Digital Marketers 8. Construction Managers, Project Managers, and Project Coordinators 9. Managers of Sales, Marketing, Training, and Administration
Credit Value	4 Theory + 2 Practical
Total Marks	Max. Marks — 30+70 Min. Passing Marks 35

Part B: Content of the course

No. of Lectures (in hrs. per week):4 Lecture per week		
Total No. of Lectures: 60 Hrs.		
Module	Topics	No. of Lectures
I	**Introduction to Spreadsheet-** What is Spreadsheet, History, Importance, Brands and platforms, Excel, Calc and Google Sheets, User Interface, Ribbon, Quick Access toolbar. **Basics of Spreadsheet-**Overview of spreadsheet, opening new file and savings spreadsheet through menu and keyboard shortcut, rows, columns, cells, workbooks and worksheets. Fundamentals of rows, columns and cells and navigation; various modes of selecting cells (shift arrow, ctrl shift arrow, mouse click and drag mouse click and shift click); merging cells; selecting rows and columns, non-contiguous cells; how to enter data(numeric, text, date), Autofit, keyboard navigation, auto complete, navigating edges, navigating first and last used cells, working with multiple sheet, inserting and deleting sheets, renaming sheets. **Number formatting-** introduction general and text number and fraction NC, accounting, percentage date, time; inserting and deleting rows and cells. **Formatting cells-** introduction bold, italics and underline, border, fill	12

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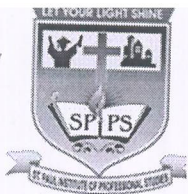E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

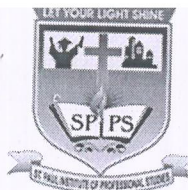|			
		and font, alignment, format painter and clear format, editing the cell content, entering multiple lines of text using ctrl+ enter, autofill, copy and paste, cut and paste, autofill series, use of fill, handle through mouse.	
II		**printing worksheet:** Select Print Area, See Print Preview, Adjusting Margin During Print Preview. **Page formatting:** Page Layout-Orientation, Size, Margins; Watermark, Page Colour, Page Borders; Inserting Headers And Footer, Inserting Page Numbers Date Path And Filename. **Viewing:** Easy View Using Freeze Panes(Freeze Rows And Columns), Split Windows, Layout View(Normal, Page Break And Print). **Saving and sharing file:** Embed, PDF, Share Workbooks Through Onedrive Online. **Import and export data**: Import Access Data, Microsoft Query, Import/ Export Text Files,XML. **Protecting/securing using file properties:** protect workbook, protect sheet, lock cells, read only workbook. **Template:** Creating worksheet through template-Budget, Calendar, Holidays, Meal Planner, Invoice, Automated Invoice, Default Templates, Time Sheet, BMI Calculator. Saving worksheet as template. **Calculations:** Entering Formula, editing Formula, copying formula, cell reference (absolute, Relative and mixed),paste formula(using keyboard shortcut and fill handle). Data Validation: Reject Invalid Dates, Budget Limit Prevent Duplicate Entries, Product Codes, Drop Down List, Dependent Drop-Down List, Cm to Inches, Kg to gm.	12
III		**Introduction to Functions:** What is function, entering functions, types of functions. **Count and Sum:** Countif, Count Blank/nonblank Cells, Count Characters, Not Equal To, Count Cells with Text,Sum,Running Total,Sumif, Sum product. **Date & Time:** Dated if, Today's Date, Date and Time Formats, Calculate Age, Time Difference, Weekdays, Days until Birthday, Last Day of the Month, Add or Subtract Time, Quarter, Day of the year. **Text:** Separate Strings, Count Words, Text to Columns, Find, Search, Change Case, Remove Spaces, Compare Text, Substitute Vs Replace, Text, Concatenate, Substring. **Lookup & Reference:** Vlookup, Tax Rates, Index and Match, Two-way Lookup, offset, Case-sensitive Lookup, Closest Match, Compare Two Columns, Xlookup. **Financial:** PMT, Loans with Difference Durations, Investments or Annuity, Compound Interest, CAGR, Load Amortization Schedule, NPV, IPR, Depreciation, Profit Margin. **Statistical:** Average, Negative Numbers to Zero, Random Number, Rank, Percentiles and Quartiles, Box and Whisker plot, AverageIf, Forecast, MaxIfs and MiniIfs, Weighted Average, Mode, Standard Deviation, Frequency. **Round:** Chop off Decimals, Nearest Multiple, Even and Odd, Mod.	12

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IV	Data Visualization: Introduction to charts, various type of charts(Column, Bar, Pie, Area, XY Scatter, Bubble, Net, Stock, Column & Line); 3-D Shape(Bar, Cylinder,Cone,Pyramid);Chart elements(Tile, Subtitle, X-axis, Y-axis, Z-axis, Display grids, Legends, Display data series); Creating a Chart; Selecting data series, select chart type, Selelct chart components – Labels, background, axes, format and design. Conditional Formatting: Manage Rules, Formula based, Data bars, Colour Scales, Icon Sets, Find Duplicates, Shade Alternate Rows, Compare Two Lists, Conflicting Rules, Heat Map.	12	
V	Data Analysis: Sort(Custom Sort Order, Sort by Color, Reverse List, Randomize List, SORT Function). Filter(Number and Text Filters, Date filters, Advanced Filter, Data Form, Remove Duplicates, outlining Data, Subtotal, Unique Values, Filter Function. Pivot Tables: Creating Pivot Table, Group Pivot Items, Pivot Table Summarization, Multi-Level Pivot Table, Frequency Distribution, Pivot Chart, Slicers, Update Pivot Table, Calculated Field/Item, GetPivotData. Tables: Structured References, Table Styles, Quick Analysis. What-If Analysis: Data Tables, Goal Seek, Quadratic Equation Solver: Transportation Problem, Assignment Problem, Capital Investment, Shortest Path Problem, Maximum Flow Problem, Sensitivity Analysis. Analysis Tool Pack: Histogram, Descriptive Statistics, ANOVA, F-Test, t-Test, Moving Average, Exponential Smoothing, Correlation, Covariance, Regression.	12	

Keywords/Tags: Excel, Calc, Formatting, Protecting range, sheet, Functions, Sort, Filter, Freeze, Pivot, Goal, Seek, Analysis, Visualization, Charts, Graphs, Correlation, Regression.

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

- Jacek Artymiak, Beginning OpenOffice Calc: From Setting Up Simple Spreadsheets to Business Forecasting,2011, Apress, ISBN: 9781430231592
- Jacek Artymiak, Beginning OpenOffice Calc Functions and Formulas Tips. Essential OpenOffice.org Calc Skills, 1st ed., 2011
- Michael Alexander, Richard Kuslieka John Walkenbach.; Microsoft Excel 2019 Bible: The Comprehensive Tutorial Resource; John Wiley & Sons.
- John Walkenbach J.; Microsoft Excel 2016 Bible: The Comprehensive Tutorial Resource; Wiley.
- Fischer W., Excel: Quick Start Guide from Beginner to expert (Excel, Microsoft Office); CreateSpace Independent Publishing Platform.
- Harvey G., Excel 2016 for Dummies (Excel for Dummies); John Wiley & Sons. Kalmstrom P.; Excel 2016 from Scratch;Excel course with demos and exercises; CreateSpace Independent Publishing Platform.
- Walkenbach J.; Excel Charts; John Wiley & Sons.

Suggestive digital platform web links
https://wiki.documentfoundation.org/images/c/c2/CG62-CalcGuide.pdf
http://www.openoffice.org/documentation/manuals/userguide3/0309CG3-DataAnalysis.pdf
https://documentation.libraryoffice.org/assests/Uploads/Documentation/en/CG4.1/PDF/CG4109-DataAnalysis.pdf
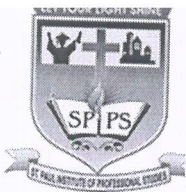https://help.libraryoffice.org/6.1/en-US/text/scalc/01/statistics.html?DbPAR=CALC
https://www.vfu.bg/en/e-Learning/MS-Office--excel.pdf
http://guides.library.duke.edu/excel/visualization

Suggested equivalent online courses
https://www.classcentral.com/course/edx-analysing-and -visualizing-data-with-excel-4480

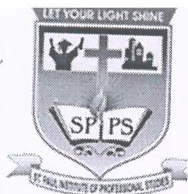| Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) :70 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation E-quiz	30
External Assessment: University Exam Section: 70 Time : 03.00 Hours	Section(A) : Six Very Short Questions	06 x 01 = 06
	Section (B) : Five Short Questions	05 x 08 = 40
	Section (C) : Two Long Questions	02 x 12 = 24 Total 70

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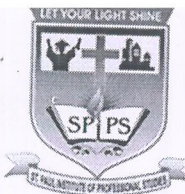E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

SPIPS
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Part A: Introduction

Program: Certificate Course	**Class: I Year -Semester II** **Session: 2025-2026**
Subject: Computer Science	

|	
Course Code	**EL-106P-S**
Course Title:	**Data Analysis and Visualization Lab**
Course Type:	**Elective**
Pre-requisite:	To study this course, a student must have prior basic knowledge of using computer and Internet. This course is open for all.
Course Learning Outcomes	On the completion of this course learners will be able to: 1. Prepare a spreadsheet file and enter data into the sheet. 2. illustrate formatting and editing capabilities on the data. 3. demonstrate basic calculations and save data. 4. import and export data into the spreadsheet. 5. Demonstrate basic visualising, analysing, organising, and sharing techniques. 6. Do the jobs in financial as well as in other business-related industries across the globe.
Expected Job Role /career opportunities	1. Accountants and Auditors 2. Administrative Assistants, Office Clerks, and Information Staff 3. Analysts in Business, Management, and Markets 4. Cost estimators 5. Educators, Teaching Assistants, and Instructors 6. Financial Analysts, Investment Bankers, and Loan Officers 7. Analysts of Market Research and Digital Marketers 8. Construction Managers, Project Managers, and Project Coordinators 9. Managers of Sales, Marketing, Training, and Administration
Credit Value	02
Total Marks	Max. Marks 30+70 Min. Passing Marks 35

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PART B: Content of the Course

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

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

Suggestive List of Practicals

Note: In the first day of the lab instructor must make the students get familiar with the interface of the Calc/Excel alongwith the movement of cutrsor,rows,columns,cells,cell number identification,formula bar,use of fill handle(drag as well double click), setting width of columns and hight of rows, selecting rows and columns, Student must entry some data and practice above.

1. Simple data entry in a workbook in different sheet as given below.
   a. Use the fill series method to fill the name as A-1, A-2 and Roll no. As 501,502 to 550.
   b. In Subject S1 Pr, put the marks more than 50 (to be used in next practical).
   c. Do not enter data in Total s2 and Total S3 column.
   d. Perform the Operations:
      i. Inserting columns and rows.
      ii. Deleting columns and rows.
      iii. Selecting range of columns
      iv. Change the width of columns and height of rows.
      v. Hiding the rows and columns
      vi. Show/unhide the rows and columns.
   e. Rename the worksheet as "UGI -Marks"
   f. Save the worksheet as marks.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Name	Roll No	S1-Th(Max. 50)	S1 Pr. (Max 50)	Tot S1(Max 100)	S2-Th(Max. 50)	S2 Pr. (Max 50)	Tot S1(Max 100)	S3-Th(Max. 50)	S3 Pr. (Max 50)	Tot S1(Max 100)	Total Marks (S1+S2+S3)	
2	A-1	501	36	40	=C2+D2	45	46			34	39			
3	A-2	502	27	32		34	38			23	40			
4	A-3	503	44	46		53	40			40	42			
5	A-4	504	24	30		34	39			33	40			
6	A-5	505	43	45		23	29			28	34			
7	-	-	-	-		-	-			-	-			
8	-	-	-	-		-	-			-	-			
9	-	-	-	-		-	-			-	-			
51	A-50	550	39	45		42	40			32	42			

2. Open the Workbook" Marks" as prepared in practical-1.
   Perform the following operations in this worksheet named "Marks".
   a. Add the formula in E2 cell as C2+D2 for subject S1 total of theory and practical.
   b. Copy formula from E2 cell and paste the formula to E3...E51 cells using keyboard and using fill handle with the help of mouse (press and drag and double click on fill handle both)
   c. Repeat the process a and b for H2 cell(=F2+G2) cell and H3..H51.
   d. Repeat the process a and b for K2 cell(=I2+J2) cell and K3..K51.
   e. Find the total of P1+P2+P3 for all A-1 to A-51 students using formula and copy copy-paste method.
   f. Save the file with keyboard shortcut CTRL+S.
3. In the sheet prepared in experiment-2,validate that any marks are more then 50 in the or greater than 100 in the S1 ,S2 and S3 theory or practical column and Total Columns. If found correct it and see that totals are automatically calculated.(Hint: Use filter method to find it). Save the file.
4. Use the above file and
   a. Calculate the percentage of all students in column M by using formula say in M2(=L2/300%) and copy-paste for rest of the students.
   b. Find the number of students having percentage more than 60%
   c. Find the number of students having percentage between 45% and 60%.
   d. Find the number of students having percentage less than 45%
   e. Save the file.

5. Use the above file (as saved in experiment -4).
   a. Find the name of the students got highest marks in S1.
   b. Find the name of the students got highest marks in S2.
   c. Find the name of the students got highest marks in S3.
   d. Find the name of the students got highest marks in both Theory and Practical in subject S1, S2, and S3.
6. Use the above file(as saved in experiment-4).
   a. Sort the data on percentage and show only the top 10 highest rank students. Save the file as "Marks-sorted".
   b. Hide the marks details and show only the name of the student and percentage column.
   c. Save/Export the file as "Top 10 rank students.pdf" as pdf file.
   d. Print the worksheet and save as pdf and share it to the instructor.
   e. Show/unhide all the columns.
   f. Export the file as "Marks.txt" file as CSV file.
7. Open a blank worksheet.
   a. Import the CSV file "Marks.txt" file into the worksheet
   b. Copy the whole content of this worksheet and paste it in the new worksheet in the same file/workbook. Rename this worksheet as "UG2-Marks".
   c. Change the delete the students having percentage less than 45%. (delete rows)
   d. Allot the new Roll Nos. to the student from 601 onwards.
   e. Change the marks of the students. Students will see that the totals automatically change.
   f. Save the file as template with file name "UG-Marks".
   g. Save and protect the file with password.
   h. Save the file
8. Use of various existing template to create the worksheet.
   a. Modify according to your need
   b. Get the required result
   c. Print it with setting of page.
   d. Save the file
9. Experiments related to the data validation (Use of drop-down list, length conversion etc.)
10. Experiments related to the use of various functions sum, average, count, sumif, countif, autosum etc.
11. Experiments related to the financial and statistical functions and round of the number's functions.
12. Create worksheet related to crop production of various crops in Indian states in last five years (Wheat, Rice, Pulses, Soyabean, Cane-Sugar etc.)
    a. Make a bar graph
    b. Make the Pie graph
13. Create worksheet related to sales of a business company having various products in last 4 quarters for 10 salespersons.
    a. Make a line graph to show the growth/decline of sales
    b. Show the graph of each salesperson's sales
    c. Find top 2 salespersons done in all 4 quarters.
    d. Find the sakes person consistent in all 4 quarters.
    e. Find the most popular product and the least popular product of the company.
14. Make all types of graphs available in the Calc/Excel using the required data with proper Title of the chart, X-axis and Y-axis title and legend titles.
15. Data Analysis using Sort and Filters.
16. Data Analysis using Pivot tables.
17. Use of conditional formatting.
18. Data analysis and Forecasting using what-if-analysis.
19. Use of solver techniques.
20. Experiments related to use of HLOOKUP and VLOOKUP.
21. Working with multiple sheets and linked data.

Keywords/Tags: Excel, Calc, Formatting, protecting range, sheet, Functions, Sort, Filter, Freeze, Pivot, Goal, Seek, Analysis, Visualization, Charts, Graphs, Correlation, Regression.
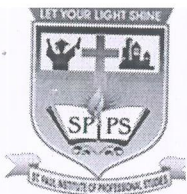
PART C: Learning Resources

Suggested Readings:

- Jacek Artymiak, Beginning OpenOffice Calc: From Setting Up Simple Spreadsheets to Business Forecasting,2011, Apress, ISBN: 9781430231592
- Jacek Artymiak, Beginning OpenOffice Calc Functions and Formulas Tips. Essential OpenOffice.org Calc Skills, 1st ed., 2011
- Michael Alexander, Richard Kuslieka John Walkenbach.; Microsoft Excel 2019 Bible: The Comprehensive Tutorial Resource; John Wiley & Sons.
- John Walkenbach J.; Microsoft Excel 2016 Bible: The Comprehensive Tutorial Resource; Wiley.
- Fischer W., Excel: Quick Start Guide from Beginner to expert (Excel, Microsoft Office); CreateSpace Independent Publishing Platform.
- Harvey G., Excel 2016 for Dummies (Excel for Dummies); John Wiley & Sons. Kalmstrom P.; Excel 2016 from Scratch;Excel course with demos and exercises; CreateSpace Independent Publishing Platform.
- Walkenbach J.; Excel Charts; John Wiley & Sons.

Suggestive digital platform web links

https://wiki.documentfoundation.org/images/c/c2/CG62-CalcGuide.pdf

http://www.openoffice.org/documentation/manuals/userguide3/0309CG3-DataAnalysis.pdf

https://documentation.libraryoffice.org/assests/Uploads/Documentation/en/CG4.1/PDF/CG4109-DataAnalysis.pdf

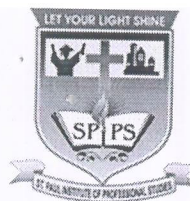https://help.libraryoffice.org/6.1/en-US/text/scalc/01/statistics.html?DbPAR=CALC

https://www.vfu.bg/en/e-Learning/MS-Office--excel.pdf

http://guides.library.duke.edu/excel/visualization

Suggested equivalent online courses:

https://www.classcentral.com/course/edx-analysing-and -visualizing-data-with-excel-4480

PART D: Assessment and Evaluation			
Internal Assessment: Continuous Comprehensive Evaluation (CCE): **30 Marks**		**External Assessment:** University Exam (UE) – **70 Marks** Time: **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	10 Marks	Practical record file	10 Marks
Viva	5 Marks	Viva voce practical	20 Marks
Lab Test from practical list	7 Marks	Table works/ Exercise Assigned (02) in practical exam	30 Marks
Assignments (Charts/ Models) Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	8 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	10 Marks
Total *Excursion/ Lab visits/ Industrial Training is compulsory	**30 Marks**	Total	**70 Marks**

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SPIPS

Program: Certificate	PART A: Introduction	
	Class: I Year- Semester I	Session: 2025-26
Course Code		
Course Title	VO-102T-S	
	Web Designing	
Course Type (Core Course/Elective Generic Elective/ Vocational)	Vocational	
Pre-Requisite (if any)	Open for All	
Course Learning Outcomes (CLO)	After studying this Course, the student will be able to- • Code a handful of useful HTML & CSS examples • Build semantic, HTML & CSS web page • Write basic scripts • Use Names, Objects, and Methods • Add Interactivity to a Web Page • Create Dynamic Web Pages using Java Script in HTML forms. • Enhance students' employability by acquiring specialized knowledge in web designing.	
Expected Job Role/ Career opportunities	**Job Role -** Web Designer/Front End Developer/ Creative Ad Designer **Job Description -** Web designers develop functional and appealing web pages, websites, web applications, online advertisements for individuals, businesses and government agencies to establish their online presence. They use knowledge of computer programming and graphic design to create websites that meet client needs. **Career Opportunities -** Typical employers of web designers are- • Software companies • IT consultancies • Specialist web design companies • Large corporate organisations • Any organisation that uses computer systems • Self-employment/freelance work is often possible for individuals with appropriate experience. • Vacancies are advertised online, by career services and by recruitment agencies.	
Credit Value	2 Theory + 2 Practical	
Total Marks	Max. Marks: 30+70	
		Min. Passing Marks: 35

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	PART B: Content of the Course	
	Total No. of Lectures + Practical (in hours per week): **L-2 Hrs. / P-2 Hrs.**	
	Total No. of Lectures/Practical: **L-30 Hrs. / P-30 Hrs.**	
Module	Topics	No. of Hours
I	**Introduction to Internet-** World Wide Web, Internet Addressing, Browser, URL, Web server, website, homepage, Domain Name. Basic concepts. **Softwares for Web Designing** - Notepad/Notepad++, Dreamweaver, Blue Griffon, Net beans, Sea Monkey, Word press, Sublime. **Introduction to HTML:** HTML Tags and Attributes, HTML Basic Tags, Formatting Tags, HTML Color Coding, Div and Span Tags for Grouping. **Lists:** Unordered Lists, Ordered Lists, Definition list. Images: Image and Image Mapping. **Hyperlink:** URL-Uniform Resource Locator, URL Encoding. Table: \<table>, \<th>, \<tr> \<td>, \<caption>, \<thead>, \<tbody>, \<tfoot>, \<colgroup>, \<col>. Attributes Using Iframe as the Target **Form:** \<input>, \<textarea>, \<button>, \<select>, \<label> **Headers:** Title, Base, Link, Styles, Script HTML Meta Tag, XHTML, HTML Deprecated Tags & Attributes	8
II	**CSS:** Introduction, Features and benefits of CSS, CSS Syntax, External Style Sheet using \<link>, Multiple Style Sheets, Value Lengths and Percentages. **Selectors:** ID Selectors, Class Selectors, Grouping Selectors, Universal Selector, Descendant/Child Selectors, Attribute Selectors, CSS-Pseudo Classes. **Color Background Cursor:** background-image, background-repeat, background- position, CSS Cursor **Text Fonts:** color, background-color, text-decoration, text-align, vertical-align, text-indent, text-transform, white-space, letter-spacing, word-spacing, line-height, font-family, font-size, font-style, font-variant, font-weight. **Lists Tables:** list-style-type, list-style-position, list-style-image, list-style, CSS Tables (border, width & height, text-align, vertical-align, padding, color) **Box Model:** Borders & Outline, Margin & Padding, Height and width, CSS Dimensions. **Display Positioning:** CSS Visibility, CSS Display, CSS Scrollbars, CSS Positioning (Static Positioning, Fixed Positioning. Relative Positioning, Absolute Positioning), CSS Layers with Z-Index. **Floats:** The float Property, The clear Property, The clearfix Hack.	7

III	**The JavaScript:** Nature of JavaScript, Script Writing Basics, Enhancing HTML Documents with JavaScript, The Building Blocks. Introduction to JavaScript, JavaScript Engines, Values, Variables and Operators, Variable Mutation, Basic Operators, Operator Precedence, JavaScript Types, Types Definition, Types in JavaScript, Objects, Type Conversion and Coercion, Static vs Dynamic Type Checking. **JavaScript Conditionals:** Introduction to Conditionals, Conditionals in JavaScript, Temary Operators and Conditionals. Conditional Ladder & Switch statement.	8
IV	**JavaScript Arrays:** Introduction to Arrays, Declaring and Mutating Arrays, Array Methods and Properties, Replication with Array Methods, Multi-dimensional Arrays. **JavaScript Loops:** Introduction to Loops, Loops in JavaScript, While and Do/While Loops, For Loops, Break and Continue in Loops, Iterating Arrays, Iterating Objects. **JavaScript Functions:** Introduction to Functions, Functions in JavaScript, Nested Functions in JavaScript, Arrow Functions in JavaScript, Function as an Argument, Function as the Returned Object, **JavaScript Scope:** Scope Introduction, Scope in JavaScript, Lexical Scope, Module Scope. Method of Adding Interactivity to a Web Page, Creating Dynamic Web Pages; Concept of Java Scripting the Forms. Java Scripting the Forms, Basic Script Construction, Talking to the Form Objects, Organizing the Objects and Scripts, Field-Level Validation, Check Required Fields like Validating Zip Code, Automated Formatting, Format Phone, Format Money, Automatic Calculation, Calculate Expiration Date, Calculate Amount etc.	7

Practical	15 Hrs

1. Design a home page which displays information about your college department using headings, HTML entities and paragraphs.
2. Implement different type of list tags in the college department homepage.
3. Create a webpage for any clinic using marquee and HTML formatting tags.
4. Create 3 Hyperlinks in home page connecting it to 3 different pages.
5. Create 3 hyperlinks in a page, which jumps to 3 different headings on same page.
6. Insert image(s) and iframe in a webpage.
7. Design a page with image of block diagram of computer, mapping each component as area with specific co-ordinates which when clicked may give their detail.
8. Create a web page having two frames, Frame 1 containing links and another with contents of the link. When link is clicked appropriate contents should be displayed on Frame 2.
9. Design a timetable and display it in tabular format.
10. Demonstrate difference between "get" and "post" method of form tag in a form with name and password text fields.
11. Design an admission form for any course in your college with text, password fields, drop-down list, check-boxes, radio buttons, submit and reset button etc.
12. Create a website for online book store with Home, Login, Catalogue, Registration page with links to all these pages in a menu on top of every page. Embed heading, paragraph, images, video, if name, form controls, table, list in this website.
13. Write a CSS style specification rule that would make all unordered lists (<ul> tags) have square bullets and a purple background.
14. Create a HTML form with the use of cascading style sheets.
15. Design a web page of your Home town with a attractive background color, text color, an image, font face by using Inline CSS formatting.
16. Create a catalog for an online shopping company that sells music records using style sheets.
17. Create a sample code to illustrate the Inline style sheet for your web page.
18. Create a sample code to illustrate the External style sheet for your web page
19. Design a web page by using different CSS border styles.
20. Demonstrate the use of CSS Box Model.
21. Change the color of all elements with the class "color text" to "Blue".
22. Set different margins for all four sides of a paragraph.

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SPIPS

Practical	15 Hrs

1. Write a JavaScript program to display the current day and time .
2. Write a JavaScript program to remove a character at the specified position of a given string and return the new string.
3. Write a JavaScript program to get the current date.
4. Write a JavaScript program to find the area of a triangle.
5. Write a JavaScript program to determine whether a given year is a leap year.
6. Write a JavaScript program to calculate multiplication and division of two numbers.
7. Write a JavaScript program to convert temperatures to and from Celsius, Fahrenheit.
8. Write a JavaScript program to check whether a given positive number is a multiple of 3.
9. Write a JavaScript program to change the case of a string.(i.e upper case to lower case and vice-versa).
10. Write a JavaScript program to compute the sum of elements of given array of integers.
11. Develop and demonstrate a HTML file that includes JavaScript script for taking a number n as input using prompt and display first n Fibonacci numbers in a paragraph.
12. Develop and demonstrate a HTML file that includes JavaScript script for taking full name in a text field and display first, middle, last name in 3 different labels. Middle and last name may be optional, thus message like "NA" should be displayed in corresponding labels. If input contains 2 words, then they should be considered as first and last name.
13. Develop and demonstrate a HTML file that includes JavaScript script for switching an image source for a image on click of "change" and "original" button.
14. Design HTML form for keeping student record, apply JavaScript validation in it for restriction of mandatory fields, numeric field, email-address field, specific value in a field etc.
15. Write a JavaScript code that displays text "Bigger Text" with increasing font size in the interval of 10ms in red color, when the font size reaches 50pt it displays "Smaller Text" in green color. Then the font size should decrease to 5pt and then stop.

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PART C: Learning Resources

Textbooks, Reference Books, Other Resources

1. **Suggested Readings:**

- Jon Duckett, HTML And CSS: Design And Build Websites, Wiley
- Jon Duckett, JavaScript And Jquery: Interactive Front-End Web Development, Wiley
- Jennifer Niederst Robbins, Learning Web Design: A Beginner's Guide To HTML, CSS, JavaScript, And Web Graphics, O'reilly
- Steven M. Schafer, Html, XHTML, And CSS Bible, Wiley
- Felke-Morris, Basics Of Web Design: Html5 & Css3, 5th Edition, Pearson Education, 2019.
- Felke-Morris, Web Development & Design Foundations With Html5, 10th Edition, Addison- Wesley, 2020.
- Ian Pouncey, Richard York, Beginning CSS: Cascading Style Sheets For Web Design, Wiley India.
- Thomas A Powell, The Complete Reference To Html
- Lee Anne Philips, Using Html, PHI
- C. Xavier, World Wide Web Design With Html,
- Xavier C, Web Technology And Design, New Age International
- Laura Lemay, Mastering Html, CSS & JavaScript Web Publishing
- Dt Editorial Services, Html 5 Black Book - Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and Jquery, DreamTech Press Publication

2. **Suggestive digital platform web links:**

- https://www.w3schools.com/
- https://spoken-tutorial.org/
- https://www.doc-developpement-durable.org/file/Projets-informatiques/cours-&-manuels- informatiques/htm- html-xml- ccs/Sams%20Teach%20Yourself%20HTML,%20CSS,%20and%20JavaScript%20All%20in% 200ne.pdf (PDF: 608 pages)
- http://www.nematrian.com/Pages/HTMLCSSJSCombined.pdf (PDF: 514 pages)
- https://www.daoudisamir.com/references/vs_ebooks/html5_css3.pdf (PDF: 681 pages)

3. **Suggested equivalent online courses:**

- https://nptel.ac.in/courses/106/105/106105084/ (NPTEL Course: Internet Technology - Part of the Course)
- https://onlinecourses.swayam2.ac.in/aic20_sp11/preview (HTML and CSS)
- https://www.coursera.org/learn/html-css-javascript-for-web-developers#syllabus (HTML, CSS, and JavaScript for Web Developers)
- https://www.classcentral.com/course/html-css-javascript-for-web-developers-4270 (HTML, CSS, and JavaScript for Web Developers)
- https://www.classcentral.com/course/duke-programming-web-4256
- https://www.coursera.org/learn/duke-programming-web (Programming Foundations with JavaScript, HTML and CSS)

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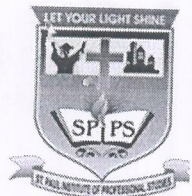Accredited by NAAC with 'A' Grade
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Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods		
Maximum Marks: 100 Theory and 100 Practical		
Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) :70 marks VIVA VOCE (Practical): 100 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation E-quiz/Case Studies	30
External Assessment: University Exam Section: 70 Time : 02.00 Hours	Section(A) : Four Very Short Questions	04 x 02 = 08
	Section (B) : Four Short Questions	04 x 08 = 32
	Section (C) : Two Long Questions	02 x 15 = 30 Total 70

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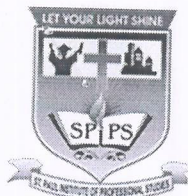
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PART A- Introduction

Program: Certificate	Class: I Semester	Session:2025-26
Course Code	VO-101T-S	
Course Title	Digital Marketing	
Course Type	Vocational	
Pre-Requisite	Open for All	
Course Learning Outcomes	After the successful completion of the course , the student shall be able to -: • Understand the Global Digital Marketing , importance of thereof, meaning of Website and levels of Website, Difference between Blog, Portal and amp: website. • Understand the Search Engine Optimization (SEO), On page and Off page Optimizationand will learn to prepare reports. • Learn about SMO(Social Media Marketing) like Facebook, Twitter, Linkdin, Tumblr, Pinterest and other Social Media Services Optimization • Understand Paid tools like Google ad words , Display advertising techniques . • Learn and apply hands on experience on tools useful to SEO for analysis on website traffic , keyword analysis and learn email marketing and ad designing.	
Expected Job Role / Career opportunities	• Digital Marketing Manager • Search Engine Optimizer • Social Media Marketer • Content Marketer • Content creator for AR-VR(Augmented Reality –Virtual Reality) • SEO Specialist for Voice Assistant	
Credit value	2 Theory + 2 Practical	
Total Marks	Mix. Marks: 70+30	Min. Passing Marks: 35

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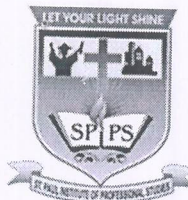E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

PART B- Content of the Course

Total no. of Lectures (in hours per week): - L-2Hr/P-2 Lab Hr

Total Lectures: -30

Unit	Topic	No. of Lectures
I	**Introduction to Digital Marketing :** Meaning of Digital Marketing , Differences from Traditional Marketing, Return of Investment on Digital Marketing vs. Traditional Marketing ,E-Commerce , Tools used for successful marketing, SWOT analysis of business for Digital Marketing ,Meaning of Blogs, Websites , Portal and their differences , Visibility, Visitor Engagement, Conversion Process, Retention, Performance Evaluation Keywords : Titles , Meta Tag	07
II	**Search Engine Optimization(SEO)** : On Page Optimization Techniques, Off Page Optimization Techniques, Preparing Reports , Creating search Campaigns, creating Display Campaigns. **Social Media Optimization (SMO)** : Introduction to Social Media Marketing, Advanced Facebook Marketing, Word Press Blog Creation, Twitter Marketing, LinkedIn Marketing, Instagram Marketing, Social Media Analytical Tools. Keywords : Google, Word press, FB, LinkedIn, Instagram, Analytics, SMO, Verbal Communication, Non-Verbal Communication , Infra Personal and Interpersonal Communication.	07
III	**Search Engine Marketing** : Meaning and use of Search Engine Marketing ,Tools used –Pay per Click , Google Adwords, Display Advertising Techniques , Report Generation ,Website Traffic Analysis, Affiliate Marketing and Ad Designing : Google Analytics, Online Reputation Management , Email Marketing , Affiliate Marketing ,Understanding Ad Words Algorithm, Advertisement Designing. Keywords : PPC, Google Ad Works , Reports, SEM , Google Analytics , Ad Design , Social Media , Affiliate	08
IV	**Internet and Webservers** : Internet : Features, Advantage and Limitation of Internet, Difference between Internet and WWW **Domain Name** : Function of Domain Names, Domain Name Syntax, DNS Architecture, Importance of Domain, Registering a Domain Name **Webserver** : Use of Webserver , Types of Webserver, file Server, Internet File Servers, LAN File Servers, Application and Its Types,	08

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		Internet –Server level devices, Message servers , Proxy Servers and its types, Database Servers, Mail Servers **Web Hosting** : Types of hosting, Web Hosting Companies, Process to host a website and steps. Website : Planning and Conceptualization of Website , Web Site Design	
		Practical • Design SEO to improve page rank of our college • Monitor Traffic of your website using Google analytics. • Using Search engine submission improves online recognition and visibility of websites. • Designing a blog. • Use of Cross Linking. • On/Off optimization of the Website. • Web Development, Audio, Video Production. • Digital Content Creation, Product & Sale review analysis	30

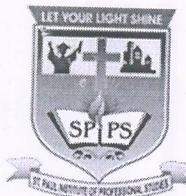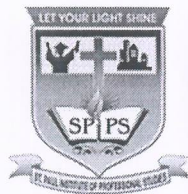| PART C- Learning Resources |
|---|
| Textbooks/ Reference Books:

1. Digital Marketing, Dr. Arpana Bharani, Ganga Publisher and Distributors

2. Ahuja Vandana Digital Marketing.Oxford University Press(2016) ISBN : 9780199455447

3. SainyRomi , Nargundkar Rajendra Digital Marketing : Cases from INDIA , Notion Press(2018) ISBN 9781644291931, 1644291932 |
| **Suggestive digital platforms web links :**
https://www.wordstream.com/keywords
https://targetinternet.com/online-digital-marketing-elearning-training-teams/
https://www.digitalmarketing.com/solutions/
http://onlinecourses.swayam2.ac.in |

Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods		
Maximum Marks: 100 Theory and 100 Practical		
Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) :70 marks VIVA VOCE (Practical): 100 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE):30	Class Test Assignment/Presentation E-quiz/Case Studies	30
External Assessment: University Exam Section: 70 Time : 02.00 Hours	Section(A) : Four Very Short Questions	04 x 02 = 08
	Section (B) : Four Short Questions	04 x 08 = 32
	Section (C) : Two Long Questions	02 x 15 = 30 Total 70

BRIDGE COURSE SYLLABUS

Department of Science and Computer Science
Basics of Computer Science

Course Objectives:

A. This course aims to provide a fundamental which covers basic and intermediate theory and practical applications of how to use a computer and Develop students' ability to work with the basic applications using MS Office Tools to meet industry standards.

Course Outline:

1. Introduction to Computer Systems
2. Introduction to MS Word formatting, Editing, Mail Merge.
3. Functions and Formulas of MS Excel along with Pivot table and
4. Making an attractive Powerpoint presentation with different tools.
5. Basics of Networking, Network security, Computer Viruses anti viruses, Email etc.
6. Basic concepts of AI, Cyber Security& Cloud Computing.

Part A Introduction			
Program: Value Added Course		**Class: I Year**	**Session:2025-2026**
Certificate Course: Coding with Python			
1	**Course Code**	CSD-S2-08	
2	**Course Title**	**Coding with Python**	
3	**Pre-requisite (if any)**	**Not Required (Open for All)**	
4	**Course Learning outcomes (CLO)**	• Gain a solid understanding of Python syntax and programming fundamentals. • Write Python code using variables, data types, operators, and control flow statements. • Work with functions, modules, and packages for code organization and reusability. • Utilize essential data structures like lists, tuples, dictionaries, and sets to manage data effectively. • Develop problem-solving skills through practical coding exercises and mini-projects.	
Part B- Content of the Course			
Total No. Hours - 36 Hours			

Unit	Topics	No. of Lectures
1	**Introduction to Python Programming:** Introduction to Python and its applications, Setting up your Python development environment, Basic syntax, variables, data types (integers, floats, strings, Booleans), Operators (arithmetic, logical, comparison), Input and output functions, Control flow statements (if, else, for loops, while loops)	12
2	**Working with Data and Functions :** Lists, tuples, dictionaries, and sets for data organization, List comprehensions for concise list manipulation, Defining and using functions to modularize code, Understanding arguments, parameters, and return values, Introduction to modules and packages for code reusability, Exploring popular Python libraries (e.g., math, random), pseudo-elements for dynamic styling, Introduction to Responsive Design Concepts	12
3	**Building Programs and Error Handling:** File handling in Python - reading and writing data, Exception handling to gracefully manage errors in code, Introduction to Object-Oriented Programming (OOP) concepts (classes and objects)	12

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Part A Introduction

Program: Value Added Course	Class: I Year	Session:2025-2026

Certificate Course: Digital Graphics & Visuals

1	Course Code	CSD-S1-01
2	Course Title	Digital Graphics & Visuals
3	Pre-requisite (if any)	Not Required (Open for All)
4	Course Learning outcomes (CLO)	1- To equip students with advanced technical skills in various graphic design software and tools. 2- To enhance ability to apply creative thinking to solve complex design challenges effectively. 3- To ensure understanding and application of current industry standards and trends in graphic design. 4- To help students build a professional portfolio showcasing their design capabilities and projects.

Total No. Hours - 36 Hours

Unit	Topics	No. of Lectures
1	1. Introduction to Graphic Designing • Scope of Designing, Career in Graphic Designing, Typography • Tools, Vector Graphics, Art & visual Graphics • Graphics- Design Theory, Color Theory, Types of Designing • Marketing & Advertising Graphic designing • User interface graphic design, Publication graphic design • Packaging Graphic design, Motion graphic design • Environment graphic design • Types of graphics	12
2	Designs:- 1. Logo Design, Business Cards Design • Brochure Design, Catalog Design, Banner Design • Postcards & Flyers Design, Templates Design, Menus Design • Social Media Ads 2. Adobe Photoshop (i) Menu Bar, Option bar, Tool Panel, Document Window (ii) Saturation, Sharpening, Layers, Typography	12

3	**1.** CorelDraw (i) Menu Bar, Option Bar, Tool bar (ii) Document, Bitmaps & vector Graphics (iii) Opening & Starting Drawings (iv) Repeating & undoing actions 2. Integration of AI in Graphic Designing **1.** Advancements in Artificial Intelligence **2.** Setting up Your AI Design Workspace 3. Overview of Leading AI Design Software 4. AI- Enhanced Landing Design 5. Exploring the AI Generated Designs	12

Part A Introduction		
Program: Value Added Course	**Class: I Year**	**Year:2025 Session:2025-2026**
Certificate Course: Marketing in the Digital Age		

1	**Course Code**	**CSD-S1-02**
2	**Course Title**	**Marketing in the Digital Age**
3	**Pre-requisite (if any)**	**Not Required (Open for All)**
4	**Course Learning outcomes (CLO)**	1. Understand digital Marketing, importance thereof, meaning of website and levels of web site, difference between blog, portal, website 2. Understand the working of SEO (search engine optimization) on page optimization, off page optimization and will learn to prepare reports 3. Learn about SMO (social media optimization) like Face book, twitter, LinkedIn, Tumbler, and other social media services optimization 4. Understand paid tools like Google ad words, display advertising techniques

Part B- Content of the Course		

Total No. Hours - 36 Hours

Unit	Topics	No. of Lecture
1	**Introduction to Digital Marketing:** Meaning of digital marketing, Differences from Traditional Marketing, Return of Investment on Digital marketing vs. Traditional Marketing, E-Commerce, Tools used for successful marketing, SWOT analysis of Business for Digital Marketing, Meaning of Blogs, Websites, Portal and their Differences, Visibility, Visitor Engagement, Conversion Process, Retention, Performance Evaluation.	12
2	**Search Engine Optimisation (SEO):** On Page Optimisation Techniques, Off Page Optimisation Techniques, Preparing Reports, Creating Search Campaigns, Creating Display Campaigns. Introduction To Social Media Marketing, Advanced Facebook Marketing, Word Press Blog Creation, Twitter Marketing. LinkedIn Marketing, Instagram Marketing, Social Media Analytical Tools.	12

3	**Search Engine Marketing:** Meaning and Use of Search Engine Marketing, Tools Used- Pay Per Click, Google Adwords, Display Advertising Techniques, Report Generation Website Traffic Analysis, Affiliate Marketing and Ad Designing: Google Analytics, Online Reputation Management, Email Marketing, Affiliate Marketing, Understanding Ad Words Algorithm, Advertisement Designing.	12

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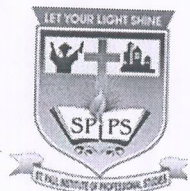
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Part A Introduction		
Program: Value Added Course	Class: I Year	Session:2025-2026
Certificate Course: AI: Tools & Applications		
1	Course Code	CSD-S1-04
2	Course Title	AI: Tools & Applications
3	Pre-requisite (if any)	Not Required (Open for All)
4	Course Learning outcomes (CLO)	1. To identify and appreciate Artificial Intelligence and describe its applications in daily life. 2. To relate, apply and reflect on the Human-machine Interactions.to identify and interact with AI applications. 3. To imagine, examine and reflect on the skills required foe futuristic job opportunities.

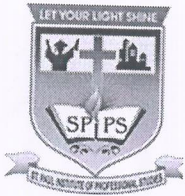| Part B- Content of the Course		
Total No. Hours - 36 Hours		
Unit	Topics	No. of Lectures
1	**Introduction:** 1. Introduction to AI 2. Intelligence is composed of : Reasoning, Learning, Problem-Solving, Perception, Linguistic Intelligence 3. Applications of Artificial Intelligence: Healthcare Finance, Customer Services, Marketing, Education 4. Need of Artificial Intelligence 5. Approaches of AI 6. Forms of AI: Strong AI, Weak AI 7. Super Intelligence 8. Limitations of AI 9. Technologies based on AI 10. Future of AI 11. AI Tools: ChatGPT, Gemini (Bard), Dall E, Synthesia, SORA	12

2	**Prompt Engineering and Design (ChatGPT & Gemini):** 1. Introduction 2. Internal Working 3. Create and Use Prompt Libraries 4. Write effective copy 5. Plot points and ideas for fictional works 6. Learn Prompt Engineering 7. improve your LinkedIn Profile and assist in Job Interview preparation 8. Learning scriptwriting for YouTube videos 9. Create web pages 10. Use AI to overcome technology challenges 11. Use prompt to advance your career 12. Use prompt engineering to target your resume for a specific job description	12
3	1. **Product Documentation with Integrating AI-** Basics of Power Point AI Tools, Essentials of Excel AI Tools, Fundamentals of Word AI Tools 2. **Image Processing and Photos Generation-** Dall E, Dall E 2 Mid Journey. 3. **Audio / Video Editing with Generative AI-** SORA Open AI, Synthesia, Soundraw	12

Part A Introduction		
Program: Value Added Course	**Class: I Year**	**Session:2025-2026**

Certificate Course: Advanced Skills & Functions		
1	**Course Code**	**CSD-S2-10**
2	**Course Title**	**Advanced Skills & Functions**
3	**Pre-requisite (if any)**	**Not Required (Open for All)**
4	**Course Learning outcomes (CLO)**	1. To perform complex data analysis and draw meaningful insights. 2. To automate repetitive tasks and increase productivity. 3. To create sophisticated and effective data visualizations. 4. To solve complex problems using advanced formulas and functions.

Part B- Content of the Course		

Total No. Hours - 36 Hours

Unit	Topics	No. of Lectures
1	**Excel Introduction:** An overview of the screen, navigation, and basic spreadsheet concepts, Various selection techniques, Shortcut Keys. **Customizing Excel:** Customizing the Ribbon, Using and Customizing AutoCorrect, Changing Excel's Default Options **Using Basic Functions:** Using Functions – Sum, Average, Max,Min, Count, Counta, Absolute, Mixed and Relative Referencing **Formatting and Proofing:** Currency Format, Format Painter, Formatting Dates, Custom and Special Formats, Formatting Cells with Number formats, Font formats, Alignment, Borders, etc, Basic conditional formatting	12

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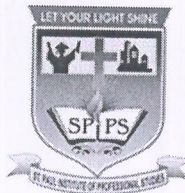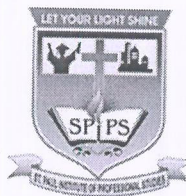Accredited by NAAC with 'A' Grade
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2	**Mathematical Functions:** SumIf, SumIfs CountIf, CountIfs AverageIf, AverageIfs, Nested IF, IFERROR Statement, AND, OR, NOT **Protecting Excel:** Level Protection, Workbook, Worksheet Protection **Text Functions:** Upper, Lower, Proper, Left, Mid, Right, Trim, Len, Exact, Concatenate, Find, Substitute **Date and Time Functions:** Today, Now, Day, Month, Year, Date, Date if, DateAdd, EOMonth, Weekday **Advanced Paste Special Techniques** Paste Formulas, Paste Formats, Paste Validations, Transpose Tables **Sorting and Filtering** Filtering on Text, Numbers & Colors, Sorting Options, Advanced Filters on 15-20 different criteria(s) **Printing Workbooks** Setting Up Print Area, Customizing Headers & Footers, Designing the structure of a template,Print Titles –Repeat Rows / Columns	8
3	**Advance Excel** **What If Analysis:** Goal Seek, Scenario Analysis, Data Tables (PMT Function), Solver Tool **Logical Functions:** If Function, How to Fix Errors – if error, Nested If, Complex if and or functions **Data Validation:** Number, Date & Time Validation, Text and List Validation, Custom validations based on formula for a cell, Dynamic Dropdown List Creation using Data **Lookup Functions:** Vlookup / HLookup, Index and Match, Creating Smooth User Interface Using Lookup, Nested VLookup, Reverse Lookup using Choose Function, Worksheet linking using Indirect Vlookup with Helper Column **Pivot Tables:** Creating Simple Pivot Tables, Basic and Advanced Value Field Setting, Classic Pivot table, Choosing Field, Filtering PivotTables, Modifying PivotTable Data, Grouping based on numbers and Dates, Calculated Field & Calculated Items	16

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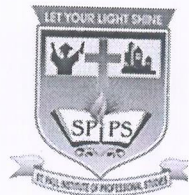E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

Part A Introduction		
Program: Value Added Course	Class: I Year	Session:2025-2026
Certificate Course: Developing Websites with HTML & CSS		
1	Course Code	CSD-S2-12
2	Course Title	Developing Websites with HTML & CSS
3	Pre-requisite (if any)	Not Required (Open for All)
4	Course Learning outcomes (CLO)	• Gain a solid understanding of the core principles of front-end development. • Develop proficiency in writing clean and well-structured HTML code. • Master the fundamentals of CSS styling for web pages. • Utilize Bootstrap to create responsive and mobile-friendly websites. • Build practical web development skills through hands-on exercises and projects.

Part B- Content of the Course		
Total No. Hours - 36 Hours		
Unit	Topics	No. of Lectures
1	**Introduction to Web Development & HTML** Introduction to web development and the front-end, The web development workflow, HTML fundamentals (structure, syntax, elements), Creating basic HTML pages (headings, paragraphs, lists, images), Understanding HTML attributes and semantic elements, Introduction to HTML5 and new features.	12
2	**Mastering the Art of CSS** Introduction to CSS and its role in styling websites, Selectors (element, class, ID) for targeting elements, CSS properties and values (color, font, background, margin, etc.), Box model and layout techniques (positioning elements), Pseudo-classes and pseudo-elements for dynamic styling, Introduction to Responsive Design Concepts	12
3	**Building with Bootstrap** Introduction to Bootstrap and its benefits for developers, Getting started with Bootstrap and integrating it into projects, The Bootstrap grid system and creating responsive layouts, Bootstrap components (buttons, forms, navigation, etc.) for building interactive elements, Utilizing Bootstrap for mobile-friendly website development	12

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BCA I Semester

Type	Subject Group	Course Code	Course Title	Credit	Total Credit Hours	Lecture Hours Per Week	Max. Marks		Total marks
							External	Internal	
Major	Computer Science	BC-101T-S	Computer Fundamentals, Organization and Architecture	4	60	4	70	30	100
	Computer Science	BC-101P-S	Computer Fundamentals and Digital Lab	2	30	2	100		100
Minor	Computer Science	BC-103T-S	Operating System	4	60	4	70	30	100
	Computer Science	BC-103P-S	Operating system Lab	2	30	2	100		100
Vocational	Management	VO-101T-S	Digital Marketing	2	30	2	70	30	100
	Management	VO-101P-S	Digital Marketing	2	30	2	100		100
	Computer Science	VO-102T-S	Web Designing	2	30	2	70	30	100
	Computer Science	VO-102P-S	Web Designing	2	30	2	100		100
	Personality Development	VO-103T-S	Personality Development	2	30	2	70	30	100
	Personality Development	VO-103P-S	Personality Development	2	30	2	100		100
	Management	VO-104T-S	Retail Management	2	30	2	70	30	100
	Management	VO-104P-S	Retail Management	2	30	2	100		100
	Management	VO-105T-S	Export Import Management	2	30	2	70	30	100
	Management	VO-105P-S	Export Import Management	2	30	2	100		100
	Taxation	VO-106T-S	E-Accounting and Taxation with GST	2	30	2	70	30	100
	Taxation	VO-106P-S	E-Accounting and Taxation with GST	2	30	2	100		100
	Accounts	VO-107T-S	Accounting and Tally Course	2	30	2	70	30	100
	Accounts	VO-107P-S	Accounting and Tally Course	2	30	2	100		100

	Management	VO-108T-S	Financial Services and Insurance	2	30	2	70	30	100
	Management	VO-108P-S	Financial Services and Insurance	2	30	2	100		100
	Management	VO-109T-S	Salesmanship	2	30	2	70	30	100
	Management	VO-109P-S	Salesmanship	2	30	2	100		100
Foundation	Hindi	FC-101-S	Bhasha aur Sanskriti	2	30	2	50		50
	Yogic Science	FC-103-S	Yoga and Meditation	2	30	2	50		50

BCA II Semester

Type	Subject Group	Course Code	Course Title	Credit	Total Credit Hours	Lecture Hours Per Week	Max. Marks		Total marks
							External	Internal	
Major	Computer Science	BC-102T-S	Programming Methodology & Data Structures	4	60	4	70	30	100
	Computer Science	BC-102P-S	Programming Methodology & Data Structures Lab	2	30	2	100		100
Elective	Mathematics	EL-109-S	Computational Mathematics	6	90	6	70	30	100
Foundation	English	FC-102-S	English Language and Indian Culture	2	30	2	50		50
	Environmental Education	FC-104-S	Environmental Education	2	30	2	50		50
Project	Field Work	PR-101A-S	Internship	4	60		100		100
	Field Work	PR-101B-S	Apprenticeship	4	60		100		100
	Field Work	PR-101C-S	Communality Engagement	4	60		100		100
	Project Work	PR-101D-S	Project	4	60		100		100