



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

Choice Based Credit System (CBCS) in the light of NEP-2020

Diploma CSE/AI/DS/Cyber Security

SEMESTER-III (2025-2028)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME						L	T	P	CREDITS
			Marks	THEORY			PRACTICAL					
				END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCS301	DCC	Object Oriented Programming (Python)	Max	60	20	20	30	20	3	0	2	4
			Min	24	16		14	9				

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

- To understand fundamentals of Object-Oriented Programming concepts
- To learn Python programming syntax and constructs.
- To apply OOP concepts using Python for problem solving.
- To develop real-world applications using Python.

COURSE ALIGNMENT WITH UNSDG:

The Course aims to fulfill the United Nations Sustainable Development Goals, **SDG 4 (Quality Education)** and **SDG 9 (Industry, Innovation and Infrastructure)**.

COURSE OUTCOMES:

After completion of the course, the student will be able to:

- | | |
|------------|--|
| CO1 | Student will be able to understand Python programming fundamentals. |
| CO2 | Student will be able to develop programs using control structures and functions. |
| CO3 | Student will be able to apply OOP concepts like classes, inheritance and polymorphism. |
| CO4 | Student will be able to build Python-based applications. |

TEACHING PEDAGOGY:

- | | |
|-----------|---|
| T1 | Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry-based teaching |
| T2 | ABL activities, Assignments, Flip Class/ Seminars, Quizzes, Oral Viva-voce examination |

ASSESSMENT TOOLS:

- | | |
|-------------|-------------------------|
| ATL1 | Quiz |
| ATL2 | Activity Based Learning |
| ATL3 | Midterm Exams |
| ATL4 | Flip Class |

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ATL5	Seminar Presentation
ATL6	Assignments
ATL7	Poster
ATL8	Oral Viva-voce examination
ATL9	Industrial Visit Report

PREREQUISITES:

Basic Computer Knowledge.

SYLLABUS:

Module	Descriptors/Topics	Hours	Assessment Tools
I	Introduction to Python: Features, installation, execution, syntax, variables, data types, operators, input/output operations.	9	ATL1 ATL3 ATL6
II	Control Structures: Conditional statements, loops, functions, recursion, modules and packages.	9	ATL1 ATL3 ATL6
III	Object-Oriented Programming: Classes, objects, constructors, inheritance, polymorphism, encapsulation, abstraction.	9	ATL1 ATL3 ATL6
IV	Exception Handling and File Handling: Errors, exceptions, try-except statements, file operations, and modules.	9	ATL1 ATL3 ATL6
V	GUI Programming: Introduction to Tkinter, widgets, event handling, mini project development.	9	ATL1 ATL3 ATL6
Total Hours		45	

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ADDITIONAL RESOURCES		
A.	Value addition to course content/ Skill enhancement content:	
	https://www.redhat.com/en/services/training/rh124-red-hat-system-administration-i	
B.	Remedial classes for slow learners:	
	As per the SVVV SOP for slow and fast learners.	
SUGGESTED READINGS:		
Text Books:		
1.	Sweigart, A. <i>Automate the Boring Stuff with Python: Practical Programming for Total Beginners</i> . 2nd Edition, No Starch Press, 2019.	
2.	Downey, A. B. <i>Think Python: How to Think Like a Computer Scientist</i> . 2nd Edition, O'Reilly Media, 2016.	
3.	Ramalho, L. <i>Fluent Python: Clear, Concise, and Effective Programming</i> . 2nd Edition, O'Reilly Media, 2022.	
Reference Books:		
1.	Lutz, M. <i>Learning Python</i> . 5th Edition, O'Reilly Media, 2013.	
2.	Beazley, D., & Jones, B. K. <i>Python Cookbook: Recipes for Mastering Python 3</i> . 3rd Edition, O'Reilly Media, 2013.	
3.	McKinney, W. <i>Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Jupyter</i> . 3rd Edition, O'Reilly Media, 2022.	
LIST OF PRACTICAL		
S No.	Practical Title	CO Mapping
1	Installation and Setup of Python Environment and Execution of Basic Python Programs	CO1
2	Programs Using Variables, Data Types, Literals, Constants, and Type Casting	CO1
3	Implementation of Input and Output Functions Using <code>input ()</code> and <code>print ()</code>	CO1

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4	Programs Based on Arithmetic, Relational, Logical, Assignment, Bitwise, Membership, and Identity Operators	CO1
5	Programs Using Decision-Making Statements (if, if-else, if-elif-else)	CO2
6	Programs Using Looping Statements (for, while, range(), break, continue, pass)	CO2
7	List Operations: Creation, Accessing, Updating, Deletion, and Applications	CO2
8	Tuple, Dictionary, and Set Operations with Built-in Functions	CO2
9	Implementation of User-Defined Functions with Parameters and Return Values	CO2
10	Programs Demonstrating Built-in Mathematical, String, and Type Conversion Functions	CO2
11	File Handling Operations: Creating, Reading, Writing, and Appending Files	CO4
12	Object-Oriented Programming: Classes, Objects, Attributes, and Methods in Python	CO3

COURSE ARTICULATION MATRIX (MAPPING OF COs WITH POs)

Course Outcomes													Correlation with POs		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	–	–	2	–	–	–	–	–	–	1	3	1	1
CO2	3	3	2	1	3	–	–	–	–	–	–	1	3	2	1
CO3	3	2	3	1	3	–	–	–	–	–	–	1	2	3	–
CO4	3	3	3	2	3	–	–	–	1	1	1	2	3	3	–

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			Marks	THEORY			PRACTICAL						
				END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
DTCS303	BS	Statistics, Probability and Calculus	Max	60	20	20	0	0	3	1	0	4	
			Min	24	16	0	0						

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

1. To understand the fundamental concepts of statistics and probability.
2. To apply statistical techniques for data analysis and interpretation.
3. To learn probability theory and its applications in real-world problems.
4. To understand basic concepts of differential and integral calculus.
5. To develop analytical and problem-solving skills using statistical and mathematical models.

COURSE ALIGNMENT WITH UNSDG:

The Course aims to fulfill the United Nations Sustainable Development Goals, **SDG 4 (Quality Education)** and **SDG 9 (Industry, Innovation and Infrastructure)**.

COURSE OUTCOMES:

After completion of the course, the student will be able to:

- | | |
|------------|---|
| CO1 | Student will be able to apply statistical methods for data analysis. |
| CO2 | Student will be able to solve probability-based problems. |
| CO3 | Student will be able to understand and apply concepts of calculus. |
| CO4 | Student will be able to analyze and interpret mathematical models for engineering applications. |

TEACHING PEDAGOGY:

- | | |
|-----------|---|
| T1 | Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry-based teaching |
| T2 | ABL activities, Assignments, Flip Class/ Seminars, Quizzes, Oral Viva-voce examination |

ASSESSMENT TOOLS:

- | | |
|-------------|-------------------------|
| ATL1 | Quiz |
| ATL2 | Activity Based Learning |
| ATL3 | Midterm Exams |
| ATL4 | Flip Class |
| ATL5 | Seminar Presentation |

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DTCS303	BS	Statistics, Probability and Calculus	Max	60	20	20	0	0	3	1	0	4	
			Min	24	16	0	0						

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

ATL6	Assignments
ATL7	Poster
ATL8	Oral Viva-voce examination
ATL9	Industrial Visit Report

PREREQUISITES:

- Basic Mathematics
- Elementary Algebra
- Basic Computer Knowledge

SYLLABUS:

Module	Descriptors / Topics	Hours	Assessment Tools
I	Basics of Statistics: Definition and scope of statistics, types of data (qualitative and quantitative), data collection methods, classification and tabulation of data. Measures of central tendency: mean, median, mode (grouped and ungrouped data). Measures of dispersion: range, variance, standard deviation. Graphical representation of data: bar chart, histogram, frequency polygon, pie chart. Introduction to skewness and kurtosis.	9	ATL1, ATL3, ATL6
II	Probability Theory: Basic concepts of probability, sample space and events. Types of events: mutually exclusive, independent and dependent events. Classical and empirical probability. Addition and multiplication theorems of probability. Conditional probability and Bayes' theorem. Numerical problems based on probability concepts.	9	ATL1, ATL3, ATL6
III	Random Variables and Probability Distributions: Random variables (discrete and continuous). Probability distribution functions. Mathematical expectation and variance. Binomial distribution: properties and applications. Poisson distribution: properties and applications. Normal distribution: properties and importance.	9	ATL1, ATL3, ATL6

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IV	Differential Calculus: Functions, limits and continuity. Concept of derivative and its interpretation. Rules of differentiation: product rule, quotient rule and chain rule. Differentiation of standard functions. Applications of derivatives: rate of change, maxima and minima.	9	ATL1, ATL3, ATL6
V	Integral Calculus: Concept of integration as inverse of differentiation. Standard integrals and rules of integration. Methods of integration: substitution and integration by parts. Definite integrals and their properties. Applications of integration: area under curves and basic engineering applications.	9	ATL1, ATL3, ATL6
Total Hours		45	

ADDITIONAL RESOURCES

A. Value addition to course content/ Skill enhancement content:

- Statistical Analysis using Spreadsheet Tools
- Introduction to Data Analytics using Python
- NPTEL Courses on Probability and Statistics
- Mathematical Modeling for Engineering Applications

B. Remedial classes for slow learners:

As per the SVVV SOP for slow and fast learners.

SUGGESTED READINGS:

Textbooks:

1. B. S. Grewal, *Higher Engineering Mathematics*, 44th ed. New Delhi, India: Khanna Publishers, 2021.
2. N. P. Bali and M. Goyal, *Engineering Mathematics*, New Delhi, India: Laxmi Publications, 2020.
3. S. C. Gupta and V. K. Kapoor, *Fundamentals of Mathematical Statistics*, 12th ed. New Delhi, India: Sultan Chand & Sons, 2020.

Reference Books:

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1. S. C. Gupta and V. K. Kapoor, *Probability and Statistics for Engineers*, New Delhi, India: Sultan Chand & Sons, 2018.
2. E. Kreyszig, *Advanced Engineering Mathematics*, 10th ed. Hoboken, NJ, USA: Wiley, 2015.
3. R. K. Jain and S. R. K. Iyengar, *Advanced Engineering Mathematics*, 5th ed. New Delhi, India: Narosa Publishing House, 2016.
4. M. Spiegel, J. Schiller and R. Srinivasan, *Schaum's Outline of Probability and Statistics*, 4th ed. New York, NY, USA: McGraw-Hill Education, 2013.

Suggested e- resources (Websites/e- books)

- NPTEL Mathematics Courses – <https://nptel.ac.in>
- Khan Academy Statistics and Probability – <https://www.khanacademy.org>
- MIT OpenCourseWare Mathematics – <https://ocw.mit.edu>

COURSE ARTICULATION MATRIX (MAPPING OF COs WITH POs)

Course Outcomes	Correlation with POs												Correlation with PSOs		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	2	1	-	-	1	1	-	2	2	1	1
CO2	3	3	3	2	2	1	-	-	1	1	-	2	2	2	1
CO3	3	3	3	3	2	1	-	-	2	1	-	2	3	2	2
CO4	3	3	3	3	3	2	1	1	2	2	1	3	3	3	2

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				END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCS305	SEC	Unix Lab	Max	0	0	0	30	20	0	0	2	1
			Min	0	0	14	9					

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	To understand the architecture and working of Unix/Linux operating system.
2.	To gain hands-on experience with Unix commands and utilities.
3.	To develop shell scripting skills for automation and problem solving.
4.	To understand file system, process management, and system-level operations.
5.	To apply Unix/Linux tools and shell programming techniques for system administration and automation tasks.
COURSE ALIGNMENT WITH UNSDG:	
The Course aims to fulfill the United Nations Sustainable Development Goals, SDG 4 (Quality Education) and SDG 9 (Industry, Innovation and Infrastructure) .	
COURSE OUTCOMES:	
After completion of the course, the student will be able to:	
CO1	Student will be able to efficiently use Unix/Linux commands for system operations.
CO2	Student will be able to manage files, directories, and permissions in Unix environment.
CO3	Student will be able to design and execute shell scripts for various applications.
CO4	Student will be able to handle processes, scheduling, system utilities, and automate administrative tasks in Unix/Linux.
TEACHING PEDAGOGY:	
T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry-based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quizzes, Oral Viva-voce examination
ASSESSMENT TOOLS:	
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DTCS305	SEC	Unix Lab	Max	0	0	0	30	20	0	0	2	1
			Min	0	0	14	9					

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

ATL4	Flip Class
ATL5	Seminar Presentation
ATL6	Assignments
ATL7	Poster
ATL8	Oral Viva-voce examination
ATL9	Industrial Visit Report

PREREQUISITES:

- Basic Computer Knowledge
- Operating System Fundamentals
- Basic Programming Concepts

SYLLABUS:

Module	Descriptors / Topics	Hours	Assessment Tools
I	Introduction to Unix/Linux Operating System: History and features of Unix/Linux, architecture of Unix/Linux operating system, login and logout procedures, command structure and syntax. Basic Unix Commands: date, cal, who, whoami, tty, uname, clear, echo, passwd. Understanding command syntax, options, arguments and manual help commands (man, whatis, apropos, --help).	6	ATL1, ATL3, ATL6
II	File and Directory Management: Unix file system structure, root directory, home directory, pathnames (absolute and relative). File and Directory Commands: ls, mkdir, rmdir, cd, pwd, cp, mv, rm, touch, cat, more, less. File viewing and editing basics. Wildcards and pattern matching (*, ?, []). File Permissions and Security: Read, write, execute permissions; chmod, chown, chgrp commands; symbolic and numeric permission representation.	6	ATL1, ATL3, ATL6
III	Text Processing and Filters: Concept of filters and pipelines in Unix. Standard input, output and error streams. Text Processing Commands: grep,	6	ATL1, ATL3, ATL6

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME						L	T	P	CREDITS
			Marks	THEORY			PRACTICAL					
				END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCS305	SEC	Unix Lab	Max	0	0	0	30	20	0	0	2	1
			Min	0	0	14	9					

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

	egrep, fgrep, sort, uniq, wc, head, tail, cut, paste. Redirection and Piping: >, >>, <, operators. Combining commands using pipelines for efficient data processing.		
IV	Shell Programming: Introduction to shell scripting and automation. Creating and executing shell scripts. Variables, environment variables, input/output operations. Operators: arithmetic, relational and logical operators. Control Structures: if, if-else, case, for, while, until loops. Functions, command-line arguments, debugging shell scripts.	6	ATL1, ATL3, ATL6
V	Process Management and System Administration: Process concepts, process states and life cycle. Foreground and background processes. Process management commands: ps, top, jobs, bg, fg, kill, nice, renice. Process scheduling concepts. System administration commands: df, du, free, uptime, who, last. Cron and at commands. Introduction to system logs, disk and memory management.	6	ATL1, ATL3, ATL6
	Total Hours	30	

ADDITIONAL RESOURCES

A.	Value addition to course content/ Skill enhancement content:
	<ul style="list-style-type: none"> Linux Foundation Training Resources Shell Scripting for Automation Linux System Administration Tutorials https://www.redhat.com/en/services/training/rh124-red-hat-system-administration-i
B.	Remedial classes for slow learners:
	As per the SVVV SOP for slow and fast learners.

SUGGESTED READINGS:

Text Books:

1.	S. Das, <i>Your UNIX: The Ultimate Guide</i> , 3rd ed. New Delhi, India: McGraw-Hill Education, 2017.
2.	Y. Kanetkar, <i>Unix Shell Programming</i> . New Delhi, India: BPB Publications, 2017.
3.	R. Stevens and S. Rago, <i>Advanced Programming in the UNIX Environment</i> , 3rd ed. Boston, MA, USA:

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME						L	T	P	CREDITS	
			Marks	THEORY			PRACTICAL						
				END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
DTCS305	SEC	Unix Lab	Max	0	0	0	30	20	0	0	2	1	
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	Addison-Wesley, 2013.
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Reference Books:

1. S. Das, *Unix Concepts and Applications*, 5th ed. New Delhi, India: McGraw-Hill Education, 2017.
2. B. W. Kernighan and R. Pike, *The UNIX Programming Environment*. Englewood Cliffs, NJ, USA: Prentice Hall, 1984.
3. J. Peek, G. Todino and J. Strang, *Learning the UNIX Operating System*, 5th ed. Sebastopol, CA, USA: O'Reilly Media, 2001.
4. W. Shotts, *The Linux Command Line*, 2nd ed. San Francisco, CA, USA: No Starch Press, 2019.

Suggested E-Resources

- Linux Documentation Project. Available: <https://tldp.org>
- GNU Bash Manual. Available: <https://www.gnu.org/software/bash/manual>
- Linux Foundation Training. Available: <https://training.linuxfoundation.org>

LIST OF PRACTICAL

S. No.	Practical Title	CO Mapping
1	Study and execution of basic Unix commands	CO1
2	Practice of file and directory operations	CO1
3	Implementation of file permissions using chmod	CO1
4	Use of wildcards for pattern matching	CO2
5	Text processing using grep, sort, uniq and wc	CO2
6	Implementation of input-output redirection	CO2
7	Use of pipes for combining commands	CO2
8	Writing simple shell scripts (addition, factorial, palindrome)	CO3

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				END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
DTCS305	SEC	Unix Lab	Max	0	0	0	30	20	0	0	2	1	
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9	Programs using conditional statements (if, if-else, case)	CO3
10	Programs using loops (for, while, until)	CO3
11	Shell scripts using functions and command-line arguments	CO3
12	Process management using ps, kill, top	CO4
13	Disk usage analysis using df and du commands	CO4

COURSE ARTICULATION MATRIX (MAPPING OF COs WITH POs)

Course Outcomes	Correlation with POs												Correlation with PSOs		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	1	3	-	-	-	1	1	-	2	2	1	1
CO2	3	3	2	2	3	2	-	1	2	2	1	2	3	2	2
CO3	3	3	3	3	3	2	1	2	3	2	2	3	3	2	3
CO4	3	3	3	2	3	3	1	1	3	2	1	3	3	3	3

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			Marks	THEORY			PRACTICAL					
				END SEM University	Two Term Exam	Teachers	END SEM University Exam	Teachers Assessment*				
DTCS306	SEC	Computer Hardware Lab	Max	00	00	00	00	50	0	0	2	1
			Min	00	00	00	00	23				

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
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COURSE OBJECTIVES:

The student will have the ability to:

1. To familiarize students with basic computer hardware components and their functions.
2. To develop skills in assembling, disassembling, and handling computer systems safely.
3. To provide practical knowledge of installing processors, memory, storage devices, and peripherals.
4. To introduce BIOS/UEFI configuration and driver installation processes.
5. To enable students to perform basic troubleshooting, maintenance, and system protection.

Course Alignment with UNSDG:

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				END SEM University	Two Term Exam	Teachers	END SEM University Exam	Teachers Assessment*				
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The Course aims to fulfill the United Nations Sustainable Development Goals, **SDG 4 (Quality Education)**.

Course outcomes: After completion of the course, the student will be able to:

CO-1	Identify and describe various computer hardware components and tools used in a hardware lab.
CO-2	Assemble and configure a computer system that includes a CPU, RAM, and storage devices.
CO-3	Install operating system support components, such as drivers and peripheral device support.
CO-4	Diagnose and troubleshoot common hardware and boot-related issues.
CO-5	Perform preventive maintenance, basic system protection, and data backup operations.

Teaching Pedagogy:

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				END SEM University	Two Term Exam	Teachers	END SEM University Exam	Teachers Assessment*				
DTCS306	SEC	Computer Hardware Lab	Max	00	00	00	00	50	0	0	2	1
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T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry-based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quizzes, Oral Viva-voce examination

Assessment Tools

AT1-1	Quiz
AT1-2	Activity-Based Learning
AT1-3	Flip Class
AT1-4	Seminar Presentation
AT1-5	Assignments

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DTCS306	SEC	Computer Hardware Lab	Max	00	00	00	00	50	0	0	2	1
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Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
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AT1-6	Poster
AT1-7	Oral Viva-voce examination
AT1-8	Industrial Visit Report

Prerequisites: Basic knowledge of computers – understanding of what a computer is and its general uses. Familiarity with operating systems – basic use of systems like Microsoft Windows or Linux.

Module	Descriptors/Topics	Hours	Assessment tools
I	Introduction to Computer Hardware & Safety: Identification of hardware components (CPU, motherboard, RAM, SMPS, HDD/SSD, peripherals), Tools used in the hardware lab (screwdrivers, anti-static wrist strap, multimeter)	6	T1,T6

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DTCS306	SEC	Computer Hardware Lab	Max	00	00	00	00	50	0	0	2	1
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Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

	Lab safety practices and ESD (Electrostatic Discharge) precautions, Opening and assembling a desktop computer system, Understanding different types of cabinets (ATX, Micro-ATX)		
II	Motherboard, Processor & Memory Installation: Study of motherboard layout and components. Installing and removing CPU (Intel/AMD basics), applying thermal paste and fixing heat sink/fan, installing RAM modules (DDR types overview), BIOS/UEFI basics, and navigation.	6	T1,T6
III	Storage Devices & Power Supply: Types of storage devices (HDD, SSD, NVMe), SATA and power cable connections, Partitioning and formatting basics, SMPS (power supply) functions and connectors, Power troubleshooting basics.	6	T1,T6
IV	Peripheral Devices & Driver Installation: Installation of peripherals (keyboard, mouse, monitor, printer),		

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Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

	Understanding ports (USB, HDMI, VGA, Ethernet), Device drivers: concept and installation, Introduction to plug-and-play devices, Basic troubleshooting of peripherals.	6	T1,T6
V	Basic Troubleshooting & Maintenance: Common hardware problems and solutions, POST (Power-On Self-Test) and beep codes, Cleaning and preventive maintenance, Virus/malware basics and system protection, Introduction to backup and recovery.	6	T1,T6
	Total Hours	30	

Additional Resources

A. Value addition to course content/ Skill enhancement content:

https://onlinecourses.swayam2.ac.in/nou25_ma10/preview

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

B. Remedial classes for slow learners: As per the SVVV SOP for slow and fast learners.

Suggested Readings:

Text Books:	
1.	<i>K. Sinha and Priti Sinha, Computer Fundamentals, 7th Edition, BPB Publications, 2021.</i>
2.	<i>V. Rajaraman, Fundamentals of Computers, 6th Edition, PHI Learning, 2014.</i>
3.	<i>M. Morris Mano, Computer System Architecture, 3rd Edition, Pearson Education, 2007.</i>
Reference Books:	
1.	<i>Carl Hamacher, Zvonko Vranesic, Safwat Zaky, and Naraig Manjikian, Computer</i>

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	<i>Organization and Embedded Systems, 6th Edition, McGraw-Hill Education, 2017.</i>
2.	<i>William Stallings, Computer Organization and Architecture: Designing for Performance, 11th Edition, Pearson Education, 2019.</i>
3.	<i>David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software Interface, 5th Edition, Morgan Kaufmann, 2014.</i>

Practical List:

Practical No.	Practical Title	CO Mapping
1	Identify internal hardware components of a desktop system (CPU, motherboard, RAM, SMPS, storage devices)	CO1
2	Demonstrate safe handling of computer hardware using anti-static precautions and lab safety tools	CO1

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3	Disassemble a desktop computer and study different hardware parts	CO1
4	Assemble a desktop computer system by connecting motherboard, CPU, RAM, and storage devices	CO2
5	Install CPU on motherboard and apply thermal paste with heat sink/fan mounting	CO2
6	Install and remove RAM modules and verify system boot using BIOS/UEFI	CO2
7	Connect and configure storage devices (HDD/SSD) and perform partitioning and formatting	CO2, CO3
8	Install and configure peripheral devices such as keyboard, mouse, monitor, and printer	CO3
9	Install and update device drivers for various hardware components and troubleshoot issues	CO3, CO4
10	Perform basic system troubleshooting, cleaning, maintenance, and	CO4, CO5

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				END SEM University	Two Term Exam	Teachers	END SEM University Exam	Teachers Assessment*				
DTCS306	SEC	Computer Hardware Lab	Max	00	00	00	00	50	0	0	2	1
			Min	00	00	00	00	23				

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

	observe POST/beep codes during boot	
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COURSE ARTICULATION MATRIX (MAPPING OF COs WITH POs)

Course Outcomes	Correlation with POs												Correlation with PSOs		
	P O1	P O2	P O3	P O4	P O5	P O6	P O7	P O8	P O9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3	2	–	–	2	–	–	–	–	–	–	1	3	1	1
CO2	3	3	3	1	3	–	–	–	1	–	–	1	3	2	2
CO3	3	2	3	1	3	–	–	–	1	1	–	1	2	3	2
CO4	3	3	2	3	3	–	–	–	1	1	–	2	2	3	3
CO5	2	2	1	2	2	–	1	–	–	–	–	3	1	2	3

Chairperson

Board of Studies, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Chairperson

Faculty of Studies, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Controller of Examination

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

Choice Based Credit System (CBCS) in the light of NEP-2020

Diploma CSE/Cyber Security/AI/DS

SEMESTER-III (2026-2029)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME						L	T	P	CREDITS
			Marks	THEORY			PRACTICAL					
				END SEM University	Two Term Exam	Teachers	END SEM University Exam	Teachers Assessment*				
DTCS306	SEC	Computer Hardware Lab	Max	00	00	00	00	50	0	0	2	1
			Min	00	00	00	00	23				

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
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