



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Application

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

B. C. A. (No Branch)

SEMESTER-I (2026-27)

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*				
BCCA104	Minor -1	Fundamentals of Computers and IT	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 create basic understanding of Computer System.
2. To provide knowledge of concepts of Operating Systems
3. To familiarize the students with the need, goal, function and architecture of various operating system available
4. To develop the understanding of trends of IT industry, safe and ethical use of IT.

COURSE ALIGNMENT WITH UNSDG:

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:

- CO1 To understand the need, goal and function of the OS**
- CO2 Understand and use Windows and Linux operating systems commands.**
- CO3 Organizing and manipulating files and folders.**
- CO4 Understand and use different editors of Linux**
- CO5 Manipulating data using input output redirection**

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

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ASSESSMENT TOOLS:

ATL1	Quiz
ATL2	Activity Based Learning
ATL3	Midterm Exams
ATL4	Flip Class
ATL5	Seminar Presentation
ATL6	Assignments
ATL7	Poster
ATL8	Oral Viva-voce examination

PREREQUISITES:

There are no formal prerequisites

SYLLABUS:

Module	Descriptors/Topics	Hours	Assessment Tools
1	Introduction to Computer Fundamentals: Introduction to Computer, Computer System Hardware, Computer Memory, Input and Output Devices, Interaction between User and Computer, Introduction to Free and Open-Source Software, Definition of Computer Virus, Types of Viruses, Use of Antivirus software.	12	ATL1 ATL3 ATL5 ATL6
2	Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices, and System & Application Software. Computer Application in e-Business, Bio-Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.	15	ATL1 ATL3 ATL5 ATL6
3	Basics of Operating System, Definition of Operating System, Objectives, types, and functions of Operating Systems. Working with Windows Operating System: Introduction, The	15	ATL1 ATL3 ATL5

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	Desktop, Structure of Windows, Windows Explorer, File and Folder Operations, The Search, The Recycle Bin, Configuring the Screen, Adding or Removing New Programs using Control Panel, Applications in windows (Paint, Notepad, WordPad, Calculator).		ATL6
4	Introduction of Basic Commands of LINUX and Editors, Managing Files and Directories in LINUX, Programming Environment in LINUX, Writing and executing programs in LINUX.	08	ATL1 ATL3 ATL5 ATL6
5	Compilers & Interpreters: aspects of compilation, memory allocation, compilation of expression compilation of control structures, code optimization, interpreters. Software Tools: Software tools for program development, editors, debug monitors, programming environment, user interfaces	10	ATL1 ATL3 ATL5 ATL6
	Total Hours	60	

ADDITIONAL RESOURCES

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

B. Remedial classes for slow learners:

As per the SVVV SOP for slow and fast learners.

SUGGESTED READINGS:

Textbooks

1. P.K. Sinha & Priti Sinha, “**Fundamentals of Computers**”, BPB Publications
2. Anita Goel, “**Computer Fundamentals**”, Pearson India
3. Peter Norton, “**Introduction to Computers**”, McGraw-Hill India
4. D.M. Dhamdhare, “**Systems Programming and Operating Systems**”, McGraw-Hill India

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Reference Books

1. Rajaraman, “Fundamentals of Computers”, PHI.
2. Peter Norton’s, “Introduction to Computers”, TMH.
3. Operating Systems –Silberschatz and Galvin -Wiley India.
4. Andrew Tananbaum, Computer Networks:, PHI
5. Pramod Koparkar “Unix for You”:, TMH.
6. Machtelt Garrels, “ Introduction to Linux”.
7. Sanders, D.: Computers Today, Tata McGraw-Hill

Suggested e- resources (Websites/e- books)

1. **Operating System Fundamentals** — Prof. Santanu Chattopadhyay, IIT Kharagpur — covers OS from foundations to architectural issues, process/memory/storage management nptel.ac.in/courses/106105214
2. **IBM SkillsBuild** — Free courses in tech fundamentals, AI, data science, and security — backed by IBM industry experts; learners can also earn digital credentials skillsbuild.org
3. **Operating System Engineering (6.828)** — Covers fundamental OS design — virtual memory, threads, context switches, kernels, interrupts, system calls, and hardware-software interaction ocw.mit.edu/courses/6-828

COURSE ARTICULATION MATRIX (MAPPING OF COs WITH POs)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H		M					L		L	M	
CO2	M	H	L	M				L			M	
CO3	M	H		M				L	L	L		
CO4	M	H		M				L			M	
Co5	M	H	H	M				L		L		

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BCCA105	Major -1	Programming Methodology and C	Max	60	20	20	0	0	3	1	0	4
			Min	24	16		0	0				

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COURSE OBJECTIVES:

The student will have ability to:

1. To familiarize the students with programming and to encourage them to develop their logic.
2. To make students well versed with C language to solve problems efficiently.
3. Using simple and well drawn illustrations develop their programming skills using modular programming.
4. To cover the various data structures and their applications.

COURSE ALIGNMENT WITH UNSDG:

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:

- CO1 Develop algorithms for problems.
- CO2 Apply the programming concepts to solve the given problems.
- CO3 Write the programs using modular programming.
- CO4 Write the programs using pointers and to manage memory.

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
- ATL6 Assignments
- ATL7 Poster
- ATL8 Oral Viva-voce examination

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PREREQUISITES:

Basic computer skills, logical thinking, basic mathematics

SYLLABUS:

Module	Descriptors/Topics	Hours	Assessment Tools
1	Unit-I An overview: Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance; algorithms & flowcharts; Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/ conventions of coding, documentation, naming variables; Top down design; Bottom-up design.	10	ATL1 ATL3 ATL5 ATL6 ATL8
2	Unit-II Fundamentals of C Programming: History of C; Structure of a C Program; Data types; Constant & Variable, naming variables; Operators & expressions; Control Constructs – if-else, for, while, do-while; Case switch statement; Arrays; Formatted & unformatted I/O; Type modifiers & storage classes; Ternary operator; Type conversion & type casting; Priority & associativity of operators.	15	ATL1 ATL3 ATL5 ATL6 ATL8
3	Unit-III Modular Programming: Functions; Arguments; Return value; Parameter passing – call by value, call by reference; Return statement; Scope, visibility and life-time rules for various types of variable, static variable; Calling a function; Recursion – basics, types of recursion- direct, indirect.	15	ATL1 ATL3 ATL5 ATL6 ATL8
4	Unit-IV Advanced Programming Techniques: Special constructs – Break, continue, exit (), goto & labels; Pointers - & and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(); String; Pointer v/s array; Structure – basic, declaration, membership operator.	10	ATL1 ATL3 ATL5 ATL6 ATL8

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5	Unit-V Miscellaneous Features: printf & scanf family; C preprocessor – basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef	10	ATL1 ATL3 ATL5 ATL6 ATL8
Total Hours		60	

ADDITIONAL RESOURCES

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

B. Remedial classes for slow learners:

As per the AUMP SOP for slow and fast learners.

SUGGESTED READINGS:

Textbooks

1. **Programming in C — Reema Thareja (Oxford University Press)**
2. **C Programming: Absolute Beginner's Guide — Greg Perry & Dean Miller (Que / Pearson, 3rd Ed.)**
3. **C Programming: A Modern Approach — K.N. King (W.W. Norton & Company, 2nd Ed.)**

Reference Books

1. KanitkarYashwant, 'Let us C', BPB New Delhi
2. Balaguruswami, 'Ansi C', TMH, Delhi
3. Kerninghan& Ritchie "The C programming language", PHI
4. Schildt, "C:The Complete reference" 4th ed TMH.
5. Cooper Mullish, "The Spirit of C", Jaico Publishing House, Delhi

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Suggested e- resources (Websites/e- books)

1. Introduction to Programming in C — IIT Kanpur (NPTEL) <https://nptel.ac.in/courses/106104128>
2. Practical Programming in C — MIT OCW <https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/>
3. CS50x — Harvard's Introduction to Computer Science <https://cs50.harvard.edu/x/>

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Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO2	M	H	H	M				L		L	M	
CO3	M	H	M	H				M	L	L	M	
CO4	M	H	M	H				L		L	M	

H= more than 50% of CO is mapped to particular PO

M= more than 30% and less than 50% of CO is mapped to particular PO

L= Less than 20% of CO is mapped to particular PO

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BCCA106	Practical (Major-1)	Programming Lab using C	Max	0	0	0	30	20	0	0	4	2
			Min	0	0		13.5	9				

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ASSESSMENT TOOLS:

ATL1 Quiz

ATL2 Activity Based Learning

ATL3 Midterm Exams

ATL4 Flip Class

ATL5 Seminar Presentation

ATL6 Assignments

ATL7 Poster

ATL8 Oral Viva-voce examination

PREREQUISITES:

There are no formal programming prerequisites.

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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*				
BCCA106	Practical (Major-1)	Programming Lab using C	Max	0	0	0	30	20	0	0	4	2
			Min	0	0		13.5	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.

SYLLABUS:

List of Practical's

S No	Practical	CO Mapping
1	Define an algorithm and flowchart. Draw algorithm and flow chart for a program that converts an input Fahrenheit degree into Celsius equivalent.	CO1, CO2
2	Write an algorithm and a C program to find the greatest among three numbers.	CO1, CO2
3	WAP a C program to reverse an input number.	CO2
4	Draw a flow chart to find prime number from 1 to 100.	CO2
5	WAP to find factorial of accepted number.	CO2
6	WAP to calculate factorial of a number using recursion.	CO2
7	WAP in C to generate Fibonacci series.	CO2
8	WAP in C to generate Pascal triangle.	CO2
9	WAP in C to swap values of two variables.	CO2
10	WAP to find a given number is prime or not prime.	CO2
11	Draw a flow chart and WAP to find prime number from 1 to N.	CO2
12	WAP to find a given number is perfect or not perfect.	CO2
13	WAP to find to find perfect number between given number N to M.	CO2
14	WAP to find factorial of accepted number.	CO2
15	WAP to calculate factorial of a number using recursion.	CO3

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S No	Practical	CO Mapping
16		CO2
17	WAP to sort an integer array in ascending and descending order according to user's choice.	CO2
18	Write a menu driven program to perform matrix addition, subtraction and multiplication.	CO2
19	WAP a C program to reverse a string by recursion.	CO2
20	WAP to read and write a structure.	CO2

ADDITIONAL RESOURCES

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

B. Remedial classes for slow learners:

As per the AUMP SOP for slow and fast learners.

SUGGESTED READINGS:

Textbooks

1. **Programming in C — Reema Thareja (Oxford University Press)**
2. **C Programming: Absolute Beginner's Guide — Greg Perry & Dean Miller (Que / Pearson, 3rd Ed.)**
3. **C Programming: A Modern Approach — K.N. King (W.W. Norton & Company, 2nd Ed.)**

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Reference Books

1. Schildt "C: The Complete reference" 4th ed TMH.
2. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi
3. Kanitkar Yashwant, 'Let us C', BPB New Delhi
4. Balaguruswami, 'Ansi C', TMH, Delhi
5. Kerninghan & Ritchie "The C programming language", PHI

Suggested e- resources (Websites/e- books)

1.	Introduction to Programming in C — IIT Kanpur (NPTEL) https://nptel.ac.in/courses/106104128
2.	Practical Programming in C — MIT OCW https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/
3	CS50x — Harvard's Introduction to Computer Science https://cs50.harvard.edu/x/

COURSE ARTICULATION MATRIX (MAPPING OF COs WITH POs)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	M	H	M				L		L	M	
CO2	M	H	H	M				L		L	M	
CO3	M	H	M	H				M	L	L	M	
CO4	M	H	M	H				L		L	M	

H= more than 50% of CO is mapped to particular PO

M= more than 30% and less than 50% of CO is mapped to particular PO

L= Less than 20% of CO is mapped to particular PO

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