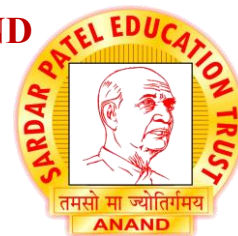




C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND
(AUTONOMOUS)

(Managed by Sardar Patel Education Trust, Anand)
(Affiliated to Sardar Patel University, Vallabh Vidyanagar)
NAAC Reaccredited CGPA – 3.30 – Grade A+



Revised Syllabus as per NEP 2020 with effect from the Academic Year 2026-2027

Bachelor of Computer Applications (BCA)
Semester – II

Course Code	US2MABCA11	Title of the Course	Problem Solving Through Advanced Programming
Total Credits	04	Hours per Week	04 Hours / Week

Course Learning Outcomes (CLOs)

CLO 1	To understand concepts of user-defined functions.
CLO 2	Learn the concept of structures and unions.
CLO 3	The fundamentals of pointers and its usage.
CLO 4	Basic concept of file handling.

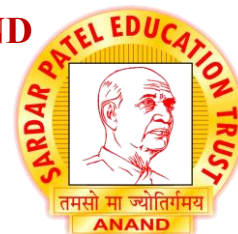
Course Content

Unit No.	Description	Weightage (%)
1.	User-Defined Functions • Introduction and need of user defined Functions • Components of user defined functions • Methods of passing parameters to functions • Recursion	25%
2.	Structure and Union • Introduction to structures • Structures and arrays • Structures within structures • Structures and functions • Unions • Command Line Arguments	25%
3.	Pointers • Introduction, usage and understanding of pointers • Declaration and initialization of pointer variables • Accessing variables through Pointers • Chain of Pointers (Pointer to Pointer) • Pointer arithmetic expression • Pointers and arrays	25%



C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND
(AUTONOMOUS)

(Managed by Sardar Patel Education Trust, Anand)
(Affiliated to Sardar Patel University, Vallabh Vidyanagar)
NAAC Reaccredited CGPA – 3.30 – Grade A+



	- Pointers as function arguments - Pointer and structure - Dynamic memory allocation	
4.	Usage of File Handling - Introduction to File Handling - File Access Modes - Input Output Operations on files - Error Handling during I/O operations	25%

Teaching – Learning Methodology

The course would be taught /learnt through ICT (e.g. Power Point Presentation, Audio-Visual Presentation), Lectures, Quizzes, Assignments, Case Study and Browsing E- Resources & Practical Learning.

Examination Evaluation Pattern

Sr. No.	Particulars	Weightage (%)
01	Continuous and Comprehensive Evaluation (CCE) (Formative Assessment)	50%
02	Semester End Evaluation (SEE) (Summative Assessment)	50%
	TOTAL	100%

Specifications for CCE and SEE

Sr. No.	Details of the Evaluation Pattern	Marks
01	Continuous and Comprehensive Evaluation (CCE) (Formative Assessment)	
	A Assignments	10
	B Multiple Choice Questions	05
	C Attendance	05
	D Written Examination (01 Hour)	30
	(Formative Assessment) (A + B + C + D)	50 Marks
02	Semester End Evaluation (SEE) (Summative Assessment)	
	E Written Examination (02 Hours)	50 Marks
	TOTAL(For 04 Credit Courses)	100 Marks

Rubrics – Based Assessment for Assignments (10 Marks)

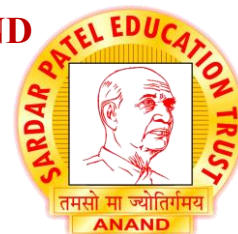
Excellent	09 – 10 Marks	Correct logic and syntax, accurate program execution/output, well-structured code, proper use of UDF, structure, pointers, and appropriate use of file handling functions
Good	07 – 08 Marks	Minor syntax or logical errors, good conceptual clarity, mostly



C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND
(AUTONOMOUS)

(Managed by Sardar Patel Education Trust, Anand)
(Affiliated to Sardar Patel University, Vallabh Vidyanagar)

NAAC Reaccredited CGPA – 3.30 – Grade A+



		correct program and output, proper use of programming concepts like UDF, structure, pointers and file handling with few mistakes
Average	05 – 06 Marks	Basic understanding of concepts, some logical or syntax errors, partially correct program/output
Basic	03 – 04 Marks	Limited clarity of concepts, noticeable errors in logic and syntax, incomplete or partially working program
Poor	01 – 02 Marks	Inadequate understanding, incorrect logic, major syntax errors, program does not execute properly
Below Poor	Zero Marks / NA	Irrelevant answer or not attempted

Note:

- Assignments may be taken in forms of written project, computerized and online suggested courses / certificates as per the decision made by the respective faculties of the courses.

Rubrics – Based Assessment for Multiple Choice Questions (05 Marks)

05 Multiple Choice Questions – 01 Mark Each (05 Marks)

Excellent	01 Mark	The chosen option is correct, no errors in response
Below Poor	Zero Marks / NA	Chosen option is incorrect, completely irrelevant, multiple options chosen / Not Attempted

Rubrics – Based Assessment for Attendance (05 Marks)

As per the Rules and Regulations provided by the Academic Section of Sardar Patel University, Vallabh Vidyanagar, for the students studying in all departments and colleges.

Reference No.: E – 3 / 3127; dated: 07-03-2024.

<https://www.spuvvn.edu/orbit-cdn/uploads/circulars/Circular-NEP-InternalExamMarks-March-April24.pdf>

Excellent	05 Marks	More than 90% (Minimum 54 Hours for 04 Credits Courses)
Good	04 Marks	80% - 89% (48 to 53 Hours for 04 Credit Courses)
Average	03 Marks	70% - 79% (42 to 47 Hours for 04 Credit Courses)
Poor	Zero / NA	Less than 70% (Less than 42 Hours) (NOT ELIGIBLE TO APPEAR FOR EXAM)

Note:

- Students with below 70% of attendance must submit their written application to their respective class coordinators with genuine reasons and evidence (in case of working or medical emergencies). Students must **not** pursue dual degree programmes that clash with the college's timings.

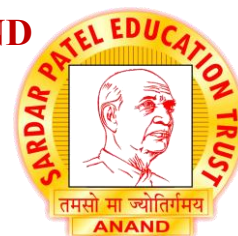
Rubrics – Based Assessment for Mid-Semester Examination (30 Marks)



C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND
(AUTONOMOUS)

(Managed by Sardar Patel Education Trust, Anand)
(Affiliated to Sardar Patel University, Vallabh Vidyanagar)

NAAC Reaccredited CGPA – 3.30 – Grade A+



Any Two Unit or 50% of The Syllabus - 15 Marks Each Question

Excellent	13 – 15 Marks	Accurate, error-free, logically presented, timely submission
Good	10 – 12 Marks	Minor errors and good conceptual clarity
Average	07 – 09 Marks	Basic understanding or partially correct
Basic	04 – 06 Marks	Limited clarity, noticeable mistakes, incomplete content
Poor	01 – 03 Marks	Inadequate conceptual clarity, incorrect content
Below Poor	Zero Marks / NA	Content is irrelevant / Not Attempted / Not Submitted

Note:

- Written Examination questions will be based on various levels of Revised Bloom's Taxonomy.

Rubrics – Based Evaluation Pattern for End-Semester Examination (50 Marks)

06 Multiple Choice Questions – 01 Mark Each (06 Marks)

Excellent	01 Mark	The chosen option is correct, no errors in response
Below Poor	Zero Marks / NA	Chosen option is incorrect, completely irrelevant, multiple options chosen / Not Attempted

Short Question (12 Marks) – 6 Question from all Units

Excellent	02 Marks	Demonstrates accurate understanding of concepts related to questions. Provides correct calculations, appropriate formulas, and clear explanations with complete answers.
Good	01 Mark	Shows partial understanding of concepts with some correct steps or explanations. Minor errors or incomplete answers may be present.
Poor	00 Mark	Incorrect, irrelevant, or no response provided.

UNIT I - 08 Marks Each Question

Excellent	06 – 08 Marks	Complete and accurate explanation of user-defined functions, components, parameter passing methods, and recursion with correct syntax, examples, and clear conceptual understanding
Good	04 – 06 Marks	Mostly correct explanation with minor mistakes in syntax or concepts related to functions and recursion
Average	03 – 04 Marks	Basic explanation with limited examples, missing some concepts like parameter passing or recursion
Basic	02 – 03 Marks	Incomplete answer, unclear understanding of functions or recursion
Poor	01 – 02 Marks	Very limited knowledge, incorrect definitions or syntax
Below Poor	Zero Marks / NA	No attempt or totally irrelevant answer

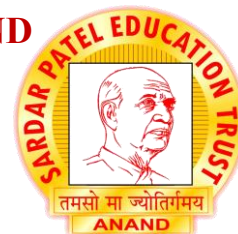
UNIT II - 08 Marks Each Question



C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND
(AUTONOMOUS)

(Managed by Sardar Patel Education Trust, Anand)
(Affiliated to Sardar Patel University, Vallabh Vidyanagar)

NAAC Reaccredited CGPA – 3.30 – Grade A+



Excellent	06 – 08 Marks	Clear and complete explanation of structures, unions, arrays, nested structures, and command line arguments with correct syntax and examples
Good	04 – 06 Marks	Minor mistakes in syntax or examples, mostly correct understanding of structures and unions
Average	03 – 04 Marks	Basic knowledge of structures and unions, limited clarity and examples
Basic	02 – 03 Marks	Partial understanding, missing key elements like nesting or unions
Poor	01 – 02 Marks	Incorrect syntax and poor conceptual understanding
Below Poor	Zero Marks / NA	No attempt or irrelevant content
UNIT III - 08 Marks Each Question		
Excellent	06 – 08 Marks	Clear explanation of all pointer concepts including declaration, arithmetic, arrays, functions, structures, and dynamic memory allocation with correct syntax and examples
Good	04 – 06 Marks	Minor mistakes in syntax or examples, mostly correct logic in pointer usage
Average	03 – 04 Marks	Basic knowledge of pointers, limited clarity in advanced topics like DMA or pointer-to-pointer
Basic	02 – 03 Marks	Incomplete explanation, confusion in pointer operations or concepts
Poor	01 – 02 Marks	Incorrect logic, very limited understanding of pointers
Below Poor	Zero Marks / NA	No attempt or wrong answer
UNIT IV - 08 Marks Each Question		
Excellent	06 – 08 Marks	Complete explanation of file handling concepts including access modes, I/O operations, and error handling with correct syntax and examples
Good	04 – 06 Marks	Minor mistakes in functions or examples, mostly correct explanation of file operations
Average	03 – 04 Marks	Basic explanation with limited examples, some missing concepts like error handling
Basic	02 – 03 Marks	Partial understanding of file handling concepts
Poor	01 – 02 Marks	Incorrect or very limited knowledge of file operations
Below Poor	Zero Marks / NA	No attempt or irrelevant answer

Note:

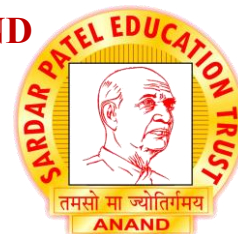
- Multiple Choice Questions of 10 Marks will be based on various levels of Revised Bloom's



C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND
(AUTONOMOUS)

(Managed by Sardar Patel Education Trust, Anand)
(Affiliated to Sardar Patel University, Vallabh Vidyanagar)

NAAC Reaccredited CGPA – 3.30 – Grade A+



Taxonomy.

- Written Examination questions will be based on various levels of Revised Bloom's Taxonomy.

PLO – CLO Mapping								
Problem Solving Through Advanced Programming								
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1	3	3	2	1	0	0	0	1
CLO 2	3	3	2	1	0	0	0	1
CLO 3	3	3	3	2	1	0	0	1
CLO 4	3	3	3	3	2	2	0	2

Note:
High: **03**; Moderate: **02**; Low: **01**; No Mapping: **00**

Suggested References and E-Resources for Further Reading	
• E. Balagurusami: Programming in ANSI C., Eighth Edition, Tata McGraw Hill Publication, 2019.	
• Kernighan B. Ritchie D. : The C Programming Language, Prentice Hall, 1988.	
• Cooper H. & Mullish H : The Spirit of C, Jaico Publication House, New Delhi, 1988.	
• https://www.geeksforgeeks.org/	
• https://www.w3schools.com/c/	
• https://www.programiz.com/c-programming	
