

Bachelor of



Computer Applications

SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)

[An Autonomous College Affiliated to Periyar University, Salem, Tamil Nadu]

[Accredited by NAAC with 'A' Grade with CGPA of 3.27]

[Recognized 2(f) & 12(B) Status under UGC Act of 1956]

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DEGREE OF BACHELOR OF COMPUTER APPLICATIONS
CHOICE BASED CREDIT SYSTEM (CBCS)

REGULATIONS AND SYLLABUS FOR

BCA PROGRAMME

(SEMESTER PATTERN)

(For Students Admitted in the College from the Academic Year 2021-2022 Onwards)



Programme Outcomes (POs)

PO1	To provide thorough understanding of nature, scope and application of computer and computer languages.
PO2	Effectively communicate business issues, management concepts, plans and decisions both in oral and written form using appropriate supportive technologies.
PO3	Develop various real time applications using latest technologies and programming languages.
PO4	Blend analytical, logical and managerial skills with the technical aspects to resolve real world issues.
PO5	Become employable in various IT companies and government jobs.

Programme Specific Outcomes (PSOs)

PSO1	Apply fundamental concepts and methods of Computer Science to a wide range of applications.
PSO2	Understand the basic concepts of digital fundamentals, OOP concepts, Databases, web applications and hardware related applications.
PSO3	Ability to understand the principles and working of computer systems.
PSO4	Able to understand, analyze and develop computer programs in the areas related to algorithm, system analysis, web design and networking for efficient design of computer based system.
PSO5	Ability to apply mathematical methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm.
PSO6	Student will able to know various issues, latest trends in technology development and thereby innovate new ideas and solutions to existing problems.
PSO7	Gain knowledge and skill set in applying core concepts.
PSO8	Able to communicate effectively and to improve their competency skills to solve real time problems.
PSO9	Analyze and apply latest technologies to solve problems in the areas of computer applications.



SRI VIDYA MANDIR ARTS & SCIENCE COLLEGE

(Autonomous)

Bachelor of Computer Applications (BCA)

Programme Pattern and Syllabus (CBCS)

(For Students Admitted in the College from the Academic Year 2021-2022 Onwards)

Sl. No	Part	Nature of Course	Course Code	Name of the Course	Hours/Week	Credits	Marks		
							CIA	ESE	Total
SEMESTER – I									
1	I	Language	21UTA1F01	Tamil – I	5	3	25	75	100
2	II	Language	21UEN1CE01	Communicative English - I	5	3	25	75	100
3	III	Core – I	21UCA1C01	Programming in Python	5	3	25	75	100
4		Core Practical – I	21UCA1P01	Programming in Python Lab	3	2	40	60	100
5		Allied – I	21UMA1A01	Allied Maths – I	6	4	25	75	100
6	IV	Value Education	21UVE101	Yoga	2	2	25	75	100
7		Add on Course	21UPS1AO01	Professional English -I	4	4	25	75	100
Total					30	21	190	510	700
SEMESTER – II									
8	I	Language	21UTA2F02	Tamil – II	5	3	25	75	100
9	II	Language	21UEN2CE02	Communicative English - II	5	3	25	75	100
10	III	Core – II	21UCA2C02	Digital Computer Fundamentals	4	3	25	75	100
11		Core – III	21UCA2C03	Programming in C	3	3	25	75	100
12		Core Practical – II	21UCA2P02	Programming in C Lab	3	2	40	60	100
13		Allied – II	21UMA2A02	Allied Maths – II	4	3	25	75	100
14	IV	Common Paper	21UES201	Environmental Studies	2	2	25	75	100



15	Add on Course	21UPS2AO02	Professional English-II	4	4	25	75	100
Total				30	23	215	585	800

Note

CBCS – Choice Based Credit system

CIA – Continuous Internal Assessment

ESE – End of Semester Examinations

List of Extension Activities

1. National Service Scheme (NSS)
2. Youth Red Cross (YRC)
3. Physical Education (PYE)
4. Eco Club (ECC)
5. Red Ribbon Club (RRC)
6. Women Empowerment Cell (WEC)



PROGRAMME SYLLABUS



Program: Bachelor of Computer Applications (BCA)				
Core – I		Course Code: 21UCA1C01		Course Title: Programming in Python
Semester I	Hours/Week 5	Total Hours 75	Credits 3	Total Marks 100

Course Objectives

1. To understand the nature of Python programming.
2. To describe the core syntax and semantics of Python programming language.
3. To infer the object-oriented programming concepts in Python.
4. To understand why Python is a useful scripting language for developers.
5. To get practical knowledge of a popular programming language Python.

UNIT – I

Introduction – History of Python – Installation – Commenting – Execution Modes – Internal Working of Python – Implementation. Python Character Set – Token – Core Data Type – The print() Function – Assigning Value to a Variable – Multiple Assignments – input(), eval() Function – Formatting Number and Strings – Inbuilt Functions. Operator and Expression: Types of Arithmetic Operators: Unary, Binary – Bitwise Operators – Operator Precedence and Associativity.

UNIT – II

Decision Making Statements – if, if – else, nested if , Multi-way if-elif – else Statements. Loop Control Statements: While Loop – range() Function – for loop. Functions: Syntax and Basics of a Function –Parameters and Arguments in a Function – Local and Global Scope of a Variable – Return Statement – Recursive Functions – Lamda Function.

UNIT – III

Lists: Introduction - Creating Lists – Accessing the Elements of a List – Negative List Indices – List Slicing – Python Inbuilt Functions for List – List Comprehensions – List Methods – List and Strings – Splitting a String in List – Passing List to a Functions – Returning List from a Function.



UNIT – IV

Object Oriented Programming: Introduction – Defining Classes – The Self-Parameter and Adding Methods to a Class- Display Class Attributes and Methods – Special Class Attributes – Accessibility – The `_init_Method` (Constructor) – Passing on Object as Parameter to a Method – `_del_()` (Destructor Method) – Class Membership Tests – Method Overloading – Operator Overloading – Inheritance: Types of Inheritance – The Object Class – Subclass Accessing Attributes of Parent Class – Multiple Inheritance – Multilevel Inheritance – Method Overriding .

UNIT – V

Tuples: Creating Tuples – `tuple()` Function – Inbuilt Functions for Tuples – Indexing and Slicing – Passing Variable Length Arguments to Tuples – Sets: Creating Sets – The Python Set Class – Set Operations – Dictionaries: Basics of Dictionaries – Creating a Dictionary – Adding, Replacing and Retrieving Values – Methods of Dictionary Class.

Text Book

1. Ashok Namdev Kamthane, Amit Ashok Kamthane, “Programming and Problem Solving with PYTHON”, McGraw Hill Education (India) Private Limited, Chennai, 2018.

Reference Books

1. S. A. Kulkarni, “Problem Solving and Python Programming”, Yes Dee Publishing Pvt. Ltd., Chennai, 2017 (Anna University Regulation 2017).
2. Martin C Brown, “The Complete Reference Python”, McGraw Hill Education, Osborne, 2018.

Web Referenced

1. <http://www.python.org>
2. <http://www/python.org/doc/>
3. <http://wiki.python.org/>
4. <http://pypi.python.org/pypi>
5. <http://www/mhhe.com/kamthane/python>



Assignments

1. Write a Python program to search a name in given tuple of names.
2. Write a Python program using Dictionary to find maximum and minimum from a set of values.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand and explain Python Programming.	K1 & K2
CO2	Interpret the fundamental Python syntax and semantics.	K2 & K3
CO3	Understand the concept of scripting and the contributions of scripting languages.	K3 & K4
CO4	Articulate the Object-Oriented Programming concepts used in python.	K5
CO5	Write codes using Multiple level of organizational structures, functions, classes, modules and package.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	M	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S – Strong

M – Medium

L – Low



Program: Bachelor of Computer Applications (BCA)				
Core Practical – I		Course Code: 21UCA1P01		Course Title: Programming in Python Lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
I	3	45	3	100

Course Objectives

1. To train the students for the basics of coding and executing Python scripts.
2. To understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To develop problem solving skills and their implementation through python.
4. To apply various constructs of the language for data analytics.

List of Programs

1. Programs using conditional branches and loops.
2. Programs using functions.
3. Programs using Lists and List processing.
4. Programs using exception handling.
5. Programs using classes and objects.
6. Programs using Overloading.
7. Programs using inheritance.
8. Programs using polymorphism.



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn to design and implement conditional branches and loops efficient programming using python.	K1 & K3
CO2	Learn working with functions, lists and list processing.	K2 & K3
CO3	Learn to work with exception handling, classes and objects.	K3 & K4
CO4	Learn to apply overloading concepts.	K3 & K5
CO5	Learn to use inheritance and polymorphism.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	S
CO2	M	M	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S – Strong

M – Medium

L – Low



Program: Bachelor of Computer Applications (BCA)				
Core – II		Course Code: 21UCA2C02		Course Title: Digital Computer Fundamentals
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	5	75	3	100

Course Objectives

1. Understand the Digital number system and their conversions.
2. Identify the operations of logic Gates and simplify the Boolean expressions using K-Map.
3. Comprehend the fundamental principles of simple Arithmetic Circuits.
4. Know the design and operations of Data Processing Circuits.
5. Realize the design of sequential logic circuits such as Flip Flops, Registers and Counters and its applications.
6. Gain the knowledge about the memory elements like RAM, ROM, and Magnetic Disk memories.

UNIT – I

Number Systems and Codes: Binary Number System – Binary-to-Decimal Conversion – Decimal-to-Binary Conversion – Octal Numbers – Hexadecimal Numbers – The ASCII Code – The Excess-3 Code – The Gray Code. Digital Computers.

UNIT – II

Digital Logic: The Basic Gates – NOT, OR, AND – Universal Logic Gates – NOR, NAND – AND-OR-Invert Gates. Combinational Logic Circuits: Boolean Laws and Theorems – Sum-of-Products Method – Truth Table to Karnaugh Map – Pairs, Quads, and Octets – Karnaugh Simplification – Don't-Care Conditions – Product-of-Sums Simplification.

UNIT – III

Data-Processing Circuits: 16-to-1 Multiplexer – 1-to-16 De-Multiplexer – BCD-to-Decimal Decoder – Decimal-to-BCD Encoder – Exclusive-or Gates. Arithmetic Circuits: Binary Addition – Binary Subtraction – Unsigned Binary Numbers – Sign-Magnitude Numbers – 2'S Complement Representation – 2'S Compliment Arithmetic.

**UNIT – IV**

Arithmetic Circuits: Arithmetic Building Blocks – The Adder – Subtractor. Flip-Flops: RS Flip-Flops – Edge-Triggered D Flip-Flops – Edge triggered JK Flip-Flops – JK Master-Slave Flip-Flops.

UNIT – V

Registers: Serial-In Serial-Out – Serial-In Parallel-Out – Parallel-In Serial-Out – Parallel-In Parallel-Out (54/74174). Memory: Introduction – Magnetic Memory – Optical Memory.

Text Book

1. Donald P Leach, Albert Paul Malvino and Goutam Saha, “Digital Principles and Applications,” 8th Edition, TMH, 2006.

Reference Books

1. Morris Mano, "Digital Logic and Computer Design," 4th Edition, Pearson, 2008.
2. Thomas C Bartee, "Digital Computer Fundamentals," 6th edition, McGraw-Hill, 1985.

Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the Number system and conversion from one system to another system.	K1 & K2
CO2	Understand the functional concepts of Logic gates.	K1, K2 & K3
CO3	Analyze the concept of Boolean Algebra and Simplifying the Boolean expression.	K3 & K4
CO4	Applying the knowledge to perform arithmetical operations using Logical circuit.	K4 & K5
CO5	Gain the Knowledge about memory Elements.	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create



Mapping of COs with POs

PO CO	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	M
CO2	S	M	S	S	M
CO3	S	S	S	S	M
CO4	S	M	S	S	S
CO5	M	S	S	S	S

S – Strong

M – Medium

L – Low



Program: Bachelor of Computer Applications (BCA)				
Core – III		Course Code: 21UCA2C03		Course Title: Programming in C
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	4	60	3	100

Course Objectives

1. To understand the nature of C programming.
2. To describe the core syntax and semantics of C programming language.
3. To develop logics which will help to create programs, applications in C.
4. To implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
5. To help students to get the practical knowledge of a programming language C.

UNIT – I

Overview of C: History of C – Importance of C – Basic Structure of C Programs. Constants, Variables and Data Types: Character Set – C Tokens – Keywords and Identifiers – Constants – Variables – Declaration of Storage Classes – Assigning Values to Variables- Defining Symbolic Constants. Operators and Expression – Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity – Mathematical Functions. Managing Input and Output Operations: Reading and Writing a Character – Formatted Input and Output.

UNIT – II

Decision Making and Branching: Simple IF, IF-ELSE, Nesting of IF-ELSE, ELSE-IF Ladder, Switch Statements – GOTO Statements. Decision Making and Looping: WHILE Statement – DO Statement – FOR Statement – Jumps in Loops. Arrays: Definition & Declaration – One Dimensional – Two Dimensional – Multi Dimensional Arrays – Dynamic Arrays.



UNIT – III

Character Arrays and Strings: Introduction – Declaring and Initializing String Variables – Reading Strings from Terminal – Writing Strings to Screen – String Handling Functions – Table of Strings. User – Defined Functions: Introduction – Need for User – Defined Function – A Multi- Function Program – Elements of User – Defined Function – Definition of Functions – Return Values and Their Types – Function Calls – Function Declaration – All Category of Functions – Nesting of Functions – Recursion – Passing Arrays to Functions – Passing Strings to Function.

UNIT – IV

Structures and Unions: Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Copying and Comparing Structure Variables – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions – Size of Structures – Bit Fields.

Pointers: Introduction – Understanding Pointers – Accessing the Address of a Variable – Initializing of Pointer Variables. Chain of Pointers – Pointer Expressions – Pointers and Arrays – Pointers and Character Strings – Arrays of Pointers – Pointers as Function Arguments – Functions Returning Pointers – Pointers to Functions – Pointer and Structures.

UNIT – V

File Management: Introduction – Defining and Opening a File – Closing a File – Input/ Output Operation on Files – Error Handling During I/O Operations – Random Access Files – Command Line Arguments.

Text Book

1. E. Balgurusamy, “Programming in ANSI C”, 5th Edition, Tata McGraw Hill, New Delhi, 2010.

Reference Books

1. Herbert Schildt, “C: The Complete Reference”, 4th Edition, McGraw Hill, 2003.
2. B.L.Juneja, “Programming in C”, 1st Edition, Cengage Learning, 2012.



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand and explain C Programming.	K1 & K2
CO2	Able to define data types and use them in simple data processing applications.	K2 & K3
CO3	Analyze programming problems to choose when regular loops should be used and when recursion will produce a better program.	K3 & K4
CO4	Design, implement, test and debug programs that use arrays for character strings and that use pointers for character strings.	K3, K4 & K5
CO5	Develop solutions to problems using C programming.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	S	M	S	S	S
CO3	S	S	S	S	S
CO4	M	S	S	S	S
CO5	S	S	M	S	S

S – Strong

M – Medium

L – Low



Program: Bachelor of Computer Applications (BCA)				
Core Practical – II		Course Code: 21UCA2P02		Course Title: Programming in C Lab
Semester	Hours/Week	Total Hours	Credits	Total Marks
II	3	45	3	100

Course Objectives

1. To train the students for the basics of coding and executing C Programming using data structures.
2. To understand how to implement various data structures in C Programming language and apply them in solving computational problems.
3. To implement the applications of stacks and queues using arrays and pointer in C program.
4. To perform some real time applications like searching, sorting in C program using the application of data structures.

List of Programs

1. Write a C program to convert the Decimal to Binary conversion
2. Write a C program to convert Binary to Decimal conversion
3. Write a C program to print the Fibonacci series.
4. Write a C program to find the factorial of a number using recursion.
5. Write a C program to illustrate string handling functions
6. Write a C Program to show Call by Value and Call by Reference.
7. Write a C program to swap two numbers using pointers.
8. Write a C program to sort the list of names & sort the list of integers in ascending order using functions.
9. Write a C program using Structures with array elements
10. Write a C Program to update the student's details using various file modes.



Course Outcomes (COs)

On successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand and basics of coding and executing the C program using data structures.	K1 & K2
CO2	Understand the various data structures and implement them using C program.	K2 & K3
CO3	Implement the applications of stacks and queues and solving the problems in C.	K3 & K4
CO4	Choose the appropriate concept of data structure to solve the complex problems in C program	K5
CO5	Try to develop a solution to solve the real time problems using any type of data structure.	K6

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping of COs with POs

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	M	S	S	S	M

S – Strong

M – Medium

L – Low