



PSGR
Krishnammal College for Women



DEPARTMENT OF BCA

**CHOICE BASED CREDIT SYSTEM (CBCS)
&
LEARNING OUTCOMES BASED CURRICULAR FRAMEWORK (LOCF)**

BACHELOR OF COMPUTER APPLICATIONS

2024-2027 Batch



PROGRAMME LEARNING OUTCOMES (PLO's)- UG

After completion of the programme, the student will be able to

PLO1: Design and Develop computer based systems with strong foundation in fundamentals and clarity on both conceptual and application oriented skills of various domains.

PLO2: Spark the reflective thinking process in various areas like information computing sectors, teaching and innovative researches.

PLO3: Work independently on a substantial software projects and as an effective team member.

PLO4: Inculcate the self directed learning in emerging technologies to upgrade them.

PLO5: Engaged in lifelong learning to equip them to the changing environment and be prepared to take up mastering programmes.

PROGRAMME SPECIFIC OUTCOMES (PSO's)

PSO1: The students will obtain an attitude to understand the societal issues and apply the acquired programming skills to develop system-based application.

PSO2: Students are capable to comprehend the technological advancements in the usage of modern tools to satisfy industry needs.

PSO3: A strong foundation to pursue higher education in the fields of teaching and research.

Department of BCA

Choice Based Credit System & Learning Outcomes Based Curricular Framework
Bachelor of Computer Applications - 2024-2027 Batch and Onwards
Semester I

Semester	Part	Course Code	Title of Course	Course Type	Instruction Hours / Week	Contact Hours	Tutorial Hours	Duration of Examination	Examination Marks			Credits
									CA	ESE	Total	
I	I	TAM2301A / HIN2301A / FRE2301A	Language I -T/H/F	L	4	58	2	3	25	75	100	3
I	II	ENG2301A	English Paper I	E	4	58	2	3	25	75	100	3
I	III	CY24C01	Programming in C	CC	4	58	2	3	25	75	100	3
I	III	PP22C02	Computational and Algorithmic Thinking For Problem Solving	CC	3	45	-	-	100	-	100	3
I	III	AP24C03	Operating Systems Fundamentals –Linux	CC	4	58	2	3	25	75	100	3
I	III	TH24A03	Numerical and statistical Techniques	GE	6	88	2	3	25	75	100	5
I	III	AP24CP1	Programming in C Lab	CC	3	45	-	3	15	35	50*	2
Non – Tamil Students												
I	IV	NME23B1/ NME23A1	Basic Tamil / Advanced Tamil	AEC	2	28	2	-	100	-	100	2
Students with Tamil as Language												
I	IV	NME23ES	Introduction to Entrepreneurship	AEC	2	30	-	-	100	-	100	
I-IV	VI	COM15SER	Community Services 30 Hours	GC	-	-	-	-	-	-	-	
I - V	VI	24BONL1 24BONL2 24BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-	-	-

*CA conducted for 25 and converted into 15, ESE conducted for 75 and converted into 35

CC: Core Course , GE: Generic Elective, AEC : Ability Enhancing Course, CA Continuous Assessment ESE : End Semester Examination, ACC – AdditionalCredit Course

EVALUATION PATTERN

23-24 Batch onwards

CA Question Paper Pattern and distribution of marks UG

Language and English

Section A 5 x 1 (No choice) : 5 Marks

Section B 4 x 5 (4 out of 6) : 20 Marks (250 words)

Section C 2 x 10 (2 out of 3) : 20 Marks (500 words)

Total : 45 Marks

UG & PG- Core and Allied - (First 3 Units)

CA Question from each unit comprising of

One question with a weightage of 2 Marks : $2 \times 3 = 6$

One question with a weightage of 5 Marks (Internal Choice at the same CLO level) : $5 \times 3 = 15$

One question with a weightage of 8 Marks (Internal Choice at the same CLO level) : $8 \times 3 = 24$

Total : 45 Marks

ALC

Section A (Paragraph answer) (4 out of 6) 4×4 : 16 Marks

Section B (Essay type) 1 out of 2 : 9 Marks

Total : 25 Marks

End Semester Examination – Question Paper Pattern and Distribution of Marks

Language and English – UG

Section A 10 x 1 (10 out of 12) : 10 Marks

Section B 5 x 5 (5 out of 7) : 25 Marks (250 words)

Section A 4 x 10 (4 out of 6) : 40 Marks (600 - 700 words)

Total : 75 Marks UG & PG - Core and Allied courses:

ESE Question Paper Pattern: $5 \times 15 = 75$ Marks

Question from each unit comprising of

One question with a weightage of 2 Marks : $2 \times 5 = 10$

One question with a weightage of 5 Marks (Internal Choice at the same CLO level): $5 \times 5 = 25$

One question with a weightage of 8 Marks (Internal Choice at the same CLO level): $8 \times 5 = 40$

End Semester for UG / PG - Advance Learner Courses

Section A 5 questions out of 8 - open choice 5×5 : 25 marks

Section B 5 questions out of 8 - open choice 5×10 : 50 marks

Total : 75 marks

Continuous Internal Assessment Pattern

Theory

I Year UG / PG (23 Batch)

CIA Test : 5 marks (conducted for 45 marks after 50 days)

Model Exam : 7 marks (Conducted for 75 marks after 85 days (Each Unit 15 Marks))

Seminar/Assignment/Quiz : 5 marks

Class Participation : 5 marks

Attendance : 3 marks

Total : 25 Marks

Practical

Lab Performance : 7 marks

Regularity : 5 marks

Model Exam : 10 marks

Attendance : 3 marks

Total : 25 marks

ESE Practical Pattern

The End Semester Examination will be conducted for a maximum of 75 marks respectively with a maximum 15 marks for the record and other submissions if any.

Project:

Evaluation of Individual / Group Project & Viva Voce for UG & PG

I Review - Selection of the field of study, : 5 Marks

Topic & literature collection

II Review - Research Design : 10 Marks

& Data Collection

III Review - Analysis & Conclusion : 10 Marks

Preparation of rough draft

Total : 25 Marks

End semester examination:

Evaluation of the project : 25 Marks

Viva Voce : 50 Marks

Total : 75 Marks

Part IV

Introduction to Entrepreneurship / Women Studies/Value education / Environmental Studies / Design Thinking

Quiz : 50 marks

Assignment : 25marks

Project / Case study : 25 marks

Total : 100 Marks

Professional English

The course offered in alignment with TANSICHE norms with 2 credits.

Quiz (5 x 20 Marks) : 100 Marks

Cyber Security I & II

Quiz : 60 Marks

Case Study : 20 Marks

Poster : 20 Marks

From the academic year 2024-25 and onwards marks allotted for attendance component in CA is modified as

91-100% attendance : 3 Marks

81-90% attendance : 2 Marks

75-80% attendance : 1 Marks

MAPPING OF PLOs WITH CLOs

COURSE	PROGRAMME LEARNING OUTCOMES				
	PLO1	PLO2	PLO3	PLO4	PLO5
COURSE- CY24C01					
CLO1	S	S	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S
COURSE – PP22C02					
CLO1	M	S	S	S	M
CLO2	S	S	S	M	M
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S
COURSE - AP24C03					
CLO1	M	M	S	S	S
CLO2	S	S	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	M	S	S
COURSE – AP24CP1					
CLO1	S	M	M	M	M
CLO2	S	M	M	M	M
CLO3	S	M	M	S	S
CLO4	S	M	M	M	S

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
CY24C01	PROGRAMMING IN C	Theory	58	2	-	3

Preamble

- This course introduces fundamental programming constructs in C.
- It covers the concepts such as arrays, functions, structures, pointers and file handling.
- It provides comprehensive coverage on industry 4.0.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the programming constructs and structure of C programming and Industry 4.0 technologies	K1
CLO2	Understand the purpose of arrays, strings, structures, pointers and files to solve problems	K2
CLO3	Apply functions to solve problems using procedure oriented approach	K3
CLO4	Analyze the problems and solve it by applying appropriate logic	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium;

PROGRAMMING IN C - CY24C01

58 Hours

Syllabus

Unit I

12 Hrs

Overview of C - Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations - **Decision Making and Branching - Decision Making and Looping.**

Unit II

11 Hrs

Arrays: One-Dimensional - Two Dimensional - Multidimensional Arrays. Character Arrays and Strings: Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - String Handling Functions.

Unit III

12 Hrs

User-Defined Functions: Need - Return Values and Types - Function Calls - Function declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Arguments with Return Values - Recursion - Scope Visibility and Life time of Variables.

Structure Definition: Structure Initialization - Comparison of Structure Variables - Arrays of Structures - Arrays within Structures.

Unit IV**12 Hrs**

Pointers: Understanding Pointers - Accessing the Address of a Variable - Declaring and Initializing Pointers - Accessing a Variable through its Pointers - **Pointers and Arrays** - **Pointers and Character Strings** - Pointers and Functions.

File Management in C: Defining and Opening a File - Closing File - **I/O Operations on Files** - **Error Handling during I/O Operations** - Command Line Arguments.

Unit V**11 Hrs**

Introduction to Industry 4.0 - Need - Reasons for Adopting Industry 4.0 - Definition - Goals and Design Principles - **Technologies of Industry 4.0** - Skills required for Industry 4.0 - Advancements in Industry - **Impact of Industry 4.0 on Society, Business, Government and People** - **Introduction to 5.0.**

TEXT BOOK

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS	EDITION / YEAR OF PUBLICATION
1	E. Balagurusamy	Programming In ANSIC	Tata Mc Graw Hill	8 th Edition, 2019
2	P. Kaliraj, T. Devi	Higher Education for Industry 4.0 and Transformation to Education 5.0	CRC Press - Taylor & Francis Group	1 st Edition, 2021

REFERENCE BOOKS

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS	EDITION / YEAR OF PUBLICATION
1	Byron Gottfried	Programming with C	Tata McGraw Hill	4 th Edition, 2018
2	Yashwvant Kanetkar	Let Us C: Authentic Guide to C Programming Language	BPB Publications	17 th Edition, 2020

PEDAGOGY

- Lectures, Group discussions, Demonstrations

COURSE DESIGNER

1. Mrs.M.Selvanayaki

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
PP22C02	COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING	Theory	45	-	-	3

Preamble

- This course aims to kindle the young minds to think like a computer scientist, with the idea that Computing and computers will enable the spread of computational thinking.
- Computational thinking is thinking recursively, reformulating a seemingly difficult problem into one which we know how to solve and taking an approach to solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Define the basic principles of Logical reasoning, Problem Solving in Computational Thinking.	K1
CLO2	Understanding the applications of propositional logic, Problem representation and techniques.	K1
CLO3	Apply algorithmic thinking to problem solving using tools Flowgorithm , Scratch, iPython.	K2
CLO4	Apply and analyze to solve domain specific problems using computational thinking concepts.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	M
CLO2	S	S	S	M	M
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S

S - Strong; M - Medium;

COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING -

PP22C02

45 Hours

Syllabus

Unit I

(7 Hrs)

Basics: Introduction to Computational Thinking- Data Logic – History of Computational Thinking-Applications of Computational Thinking.

Unit II

(8 Hrs)

Data- Information and Data - Data Encoding - Logic - Boolean logic - Applications of simple Propositional Logic. Tool: Flowgorithm and Scratch.

Unit III**(10 Hrs)**

Problem Solving and Algorithmic Thinking: Problem definition- Logical reasoning- Problem decomposition- Abstraction- Problem representation via Algorithmic thinking: Name binding- Selection- Repetition and Control Abstraction- Simple Algorithms – Comparison of performance of Algorithms.

Unit IV**(8 Hrs)**

Activities in Class: Sudoku-Towers of Hanoi- Graph Coloring-Geographical Map reading-Poem reading-Novel reading- Data analysis on news.

Unit V**(12 Hrs)**

Problem Solving Techniques- Factoring and Recursion Techniques- Greedy Techniques-Divide and Conquer- Search and Sort Algorithms- Text Processing and Pattern matching. Tool: iPython

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS	EDITION / YEAR OF PUBLICATION
1	David Riley and Kenny Hunt	Computational Thinking for Modern Solver	Chapman & Hall/CRC	1 st Edition, 2014
2	Paolo Ferragina, Fabrizio Luccio	Computational Thinking First Algorithms	Springer	1 st Edition, 2018
3	Karl Beecher	Computational Thinking – A beginner’s guide to problem solving	BSC publication	1 st Edition, 2017

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designers

1. Mrs.T.S.Anushya Devi
2. Mrs.S.Kavitha
3. Mrs.V.Bharathi

Evaluation Pattern

Assessment	Number	Marks
Quiz (online or offline)	5	50
Class Activity	5	25
Group Projects (Domain Specific)	1	25
Total		100

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
AP24C03	OPERATING SYSTEMS FUNDAMENTALS – LINUX	Theory	58	2	-	3

Preamble

- This subject is designed to provide the students with a thorough discussion of the fundamentals of operating system.
- To explore the various memory management scheme and to perform administrative task on LINUX servers.

Course Learning Outcomes

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

CLOs Number	CLO Statement	Knowledge Level
CLO1	Recall the basic concepts with functions of operating systems and Linux system.	K1
CLO2	Understand the operating systems objectives and functionality along with system programs and system calls.	K2
CLO3	Compare and contrast various memory management schemes.	K2
CLO4	Demonstrate deadlock, prevention and avoidance algorithms, storage management, various scheduling algorithms and shell programming.	K3

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO 5
CLO1	M	M	S	S	S
CLO2	S	S	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	M	S	S

S- Strong; M-Medium; L-Low

OPERATING SYSTEMS FUNDAMENTALS – LINUX - AP24C03

58 Hours

SYLLABUS

UNIT I

(12 Hrs)

Introduction: What is operating systems do - **Computer System Architecture - Operating- System Operations**. Process Management: **Process Concept** - Process Scheduling - Interprocess communication.

UNIT II

(12 Hrs)

Process Scheduling: **Basic Concepts- Preemptive and Nonpreemptive Scheduling** - Scheduling Algorithms (FCFS, SJF & Round Robin only). Synchronization: **Back ground-The Critical Section Problem-Peterson's Solution- Semaphores- Deadlock: Deadlock Characterization** - Methods Handling Deadlocks - Recovery from Deadlock.

UNIT III

(11 Hrs)

Memory Management Strategies: **Background-Contiguous Memory Allocation**-Paging. Virtual Memory Management: Demand Paging - Page Replacement - Basic Page Replacement, **FIFO Page Replacement**, Optimal Page Replacement.

UNIT IV**(11 Hrs)**

What Linux Is – Becoming a Linux Power User : About Shells and Terminal Windows-Choosing your shell - **Running Commands** - **Recalling Commands Using Command History** - Connecting and Expanding Commands -Using Shell Variables.

UNIT V**(12 Hrs)**

Moving Around the File system : Using Basic File system Commands - Using Meta characters and Operators - **Listing Files and Directories** - Moving, Copying, and Removing Files.

Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS	EDITION / YEAR OF PUBLICATION
1	Abraham Silberschatz, Peter Baer Galvin, G Gagne	OPERATING SYSTEMS CONCEPTS	Wiley Publishers,	10 th Edition, 2018
2	Christopher Negus	LINUX BIBLE	Wiley Publishers,	10 th Edition, 2020

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS	EDITION / YEAR OF PUBLICATION
1	Archer J harries	Operating System	Tata Mc Graw Hill	2 nd Edition, 2011
2	Williams E. Shotts	The Linux CommandLine: A Complete Introduction	John Wiley & Sons	2 nd Edition, 2019
3	Jason Cannon	Linux for Beginners	Create space Independent Pub	1 st Edition, 2014

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designers

1. Mrs.T.S.Anushya Devi
2. Dr.R.Surya Grace

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
AP24CP1	PROGRAMMING IN C LAB	Practical	-	-	45	2

Preamble

- To provide the hands on experience on C Programming and improve the practical skill set.
- The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of C code.
- To know the steps involved in compiling, linking and debugging C code, feel more confident about writing the C functions, write some complex programs.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the basic terminologies of c programming by using different data types, decision structures, loops and functions.	K1
CLO2	Understand the dynamics of memory allocation by the use of pointers and files.	K2
CLO3	Understand the concepts of Structures and Unions.	K2
CLO4	Design and develop the simple business application.	K3

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	M	M	M
CLO2	S	M	M	M	M
CLO3	S	M	M	S	S
CLO4	S	M	M	M	S

S- Strong; M-Medium;

PROGRAMMING IN C LAB - AP24CP1

45 Hours

LIST OF PROGRAMS

- Using different operators.
- Control Structures.
- Using arrays.
- String handling functions.
- User defined functions.
- Structures.
- Pointers.
- Working with files.

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

1. Mrs. M. Selvanayaki
2. Ms. A. Deepika