PSGR Krishnammal College for Women

Department of B.Sc. Computer Science (Artificial Intelligence)

CHOICE-BASED CREDIT SYSTEM (CBCS)

&

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (LOCF)

SYLLABUS

B.Sc. Computer Science(Artificial Intelligence)

2025 – 2028 Batch

Programme Learning Outcomes (PLO)

After completion of the Programme, the students will be able to

PLO1: Exhibit technical and technological knowledge in core areas of computer science and Artificial Intelligence.

PL02: Apply technical, problem solving skills and critical thinking to provide solutions for real world complex problems.

PLO3: Acquire professional proficiency to accomplish employability and entrepreneurship

PLO4: Advance skills to gain global competency and innovate in developing and deploying AI applications

PLO5: Acquire holistic development with strong emphasis on values and ethics

PLO6: Uphold social responsibilities in alignment with their roles

Programme Specific Outcomes (PSO)

The students at the time of graduation will

PSO1: Apply technical skills attained through laboratory exercises, projects, internships and value added programmes to solve multi-disciplinary problems

PSO2: Analyze a problem, identify and define the requirements appropriate to obtain solution

PSO3: Design AI experiments, carry out analysis and interpretation of data, to provide valid conclusions for decision making

PSO4: Adapt to emerging technologies to design and implement solutions for societal needs

PSO5: Create systems by applying modern tools for the complex activities

PSO6: Apply ethical principles and responsibilities in all the activities they involve

PSO7: Function effectively as an individual, and as a member or leader in diverse teams

PSO8: Recognize the need and have the ability to engage in independent and life-long learning in the broadest context of technological changes

PSGR
Krishnammal College for Women

B.Sc. Computer Science (Artificial Intelligence)

Semester	Part	Course Code	Title of the 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	Language	4	58	2	3	25	75	100	3
	II	ENG2301A	English Paper I	English	4	58	2	3	25	75	100	3
	III	AI24C01	Java Programming	CC	4	58	2	3	25	75	100	3
	III	AI24CP1	Java Programming Lab	CC	3	45	-	3	15	35	50*	2
	III	PP22C02	Computational and Algorithmic Thinking for Problem Solving	CC	3	45	-	-	100	-	100 #	3
	III	AP24C03	Operating System Fundamentals - Linux	CC	4	58	2	3	25	75	100	3
	III	TH24A04	Linear Algebra	GE	6	88	2	3	25	75	100	5
I-II	VI	NM23GAW	General Awareness	AEC	SS	-	-	-	100	-	100	Gr
I	IV	**Students with Tamil as Language**										
		NME23ES	Introduction to Entrepreneurship	AEC	2	30	-	-	100	-	100 #	
		Non-Tamil Students										
		NME23A1/ NME23B1	Advanced Tamil I / Basic Tamil I	AEC	2	28	2	2	100	-	100#	2
	VI	COM15SER	Community Services 30 Hours	GC	-	-	-	-	-	-	-	
I-V	VI	24BONL1/ 24BONL2/ 24BONL3	Online Course 1 Online Course 2 Online Course 3	ACC	-	-	-	-	-	-	-	

L – Language AEC – Ability Enhancement Course SS-Self Study
E – English GE – Generic Elective CA - Continuous Assessment
CC- Core Course ACC – Additional Credit Course ESE - End Semester Examination,
CA conducted for 25 converted to 15, ESE conducted for 75 converted to 35, * After Class Hours.

QUESTION PAPER PATTERN

CORE & ALLIED PAPERS

CA Question Paper Pattern and distribution of marks UG Core and Allied - (First 3 Units)

Question from each unit comprising of (Semester I to II)

SECTION	MARKS	TOTAL
A – 3 X 2 Marks (No Choice)	06	45
B – 3 X 5 Marks (Internal Choice at the same CLO level)	15	
C - 3 X 8 Marks (Internal Choice at the same CLO level)	24	

End Semester Examination: 5 x 15 = 75 Marks (Semester I to II)

SECTION	WORD LIMIT	MARKS	TOTAL
A - 5 x 2 Marks (No Choice)	One or Two Sentences	10	75
B – 5 x 5 Marks (Internal Choice at same CLO Level)	300	25	
C – 5 x 8 Marks (Internal Choice at same CLO Level)	600-800	40	

WEIGHTAGE ASSIGNED TO VARIOUS COMPONENTS OF CONTINUOUS INTERNAL

ASSESSMENT (Semester I and II)

Theory

	CIA Test	Model Exam	Seminar/Assignment/ Quiz	Class Participation	Attendance	Max. Marks
Core / Allied	5	7	5	5	3	25

Practical

	Model Exam	Lab Performance	Regularity in Record Submission	Attendance	Maximum Marks
Core / Allied	10	7	5	3	25

*Departments can plan the above pattern according to their course as Test 1 & 2 - Theory / one theory and one practical / both as practical / one theory or practical with one project.

RUBRICS Assignment/ Quiz / Seminar

Maximum - 20 Marks (converted to 4 marks)

Criteria	4 Marks	3 Marks	2 Marks	1 Mark
Focus Purpose	Clear	Shows awareness	Shows little awareness	No awareness
Main idea	Clearly presents a main idea.	Main idea supported throughout	Vague sense	No main idea
Organization: Overall	Well planned	Good overall organization	There is a sense of organization	No sense of organization
Content	Exceptionally well presented	Well presented	Content is sound	Not good
Style: Details and Examples	Large amounts of specific examples and detailed description	Some use of examples and detailed descriptions	Little use of specific examples and details	No use of examples

CLASS PARTICIPATION

Maximum - 20 Marks (Converted to 5 marks)

Criteria	5 Marks	4 Marks	3 Marks	2 Marks	1 Mark	Points scored
Level of Engagement in Class	Student proactively contributes to class by offering ideas and asks questions more than once per class.	Student proactively contributes to class by offering ideas and asks questions once per class	Student contributes to class and asks questions occasionally	Student rarely contributes to class by offering ideas and asking no questions	Student never contributes to class by offering ideas	

Listening Skills	Student listens when others talk, both in groups and in class. Student incorporates or builds off of the ideas of others.	Student listens when others talk, both in groups and in class.	Student listens when others talk in groups and in class occasionally	Student does not listen when others talk, both in groups and in class.	Student does not listen when others talk, both in groups and in class. Student often interrupts when others speak.	
Behavior	Student almost never displays disruptive behavior during class	Student rarely displays disruptive behavior during class	Student occasionally displays disruptive behavior during class	Student often displays disruptive behavior during class	Student almost always displays disruptive behavior during class	
Preparation	Student is almost always prepared for class with required class materials	Student is usually prepared for class with required class materials	Student is occasionally prepared for class with required class materials	Student is rarely prepared for class with required class materials	Student is almost never prepared for class.	
					Total	

MAPPING OF PLOs WITH CLOs

COURSE	PROGRAMME LEARNING OUTCOMES					
	PLO1	**PLO2**	**PLO3**	**PLO4**	**PLO5**	**PLO6**
COURSE- AI24C01						
CLO1	S	S	S	M	L	L
CLO2	S	S	S	M	L	L
CLO3	S	S	S	M	L	L
CLO4	S	S	S	M	L	L
COURSE – AI24CP1						
CLO1	M	M	S	S	L	L
CLO2	M	M	S	M	M	S
CLO3	S	M	M	S	S	M
CLO4	M	M	S	S	L	S
COURSE - PP22C02						
CLO1	M	S	S	S	S	S
CLO2	S	S	S	M	S	S
CLO3	S	M	S	S	S	S
CLO4	S	S	M	S	S	S
COURSE - AP24C03						
CLO1	M	M	S	S	S	M
CLO2	S	S	S	S	S	S
CLO3	S	S	S	S	S	S
CLO4	S	S	M	S	S	S

SEMESTER I

Course Number	Course Name	Category	L	T	P	Credit
AI24C01	**JAVA PROGRAMMING**	**Theory**	**58**	**2**	**-**	**3**

PREAMBLE

This course introduces object-oriented programming concepts and also java programming. It covers the concept of loops, arrays, input/output structures, events, exceptions and threads using Java.

PREREQUISITE

- Programming Language
- Basics of computers

COURSE LEARNING OUTCOMES

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Remember the principles of object-oriented programming, Java language syntax and semantics	K1
CLO2	Understand the concepts of object-oriented programming and java	K2
CLO3	Apply the principles of inheritance, packages and interfaces in simple java applications	K3
CLO4	Analyze the working features of java language	K4

MAPPING WITH PROGRAMME OUTCOMES

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1	S	S	S	M	L	L
CLO2	S	S	S	M	L	L
CLO3	S	S	S	M	L	L
CLO4	S	S	S	M	L	L

S- Strong; M-Medium; L-Low

SYLLABUS

UNIT I **(11 Hrs.)**

Fundamentals of Object-Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object-Oriented Programming, **Benefits of Object-Oriented Programming, Application of Object-Oriented Programming.** Java Evolution: History, Features, Comparison of Java with C and C++. Java and Internet, Java and World Wide Web, Web Browsers. Overview of Java: Simple Java program, Structure, Java Tokens, Statements, Java Virtual Machine.

UNIT II **(12 Hrs.)**

Constants, Variables, Data Types **- Operators and Expressions** – Decision Making and Branching: if, if...Else, nested if, switch, ?: operator. Decision Making and Looping: while, do, for – **Labelled loops.** Classes, objects and methods: Introduction **- Defining a class** - method declaration **- creating objects -** accessing class methods - method overloading - **nesting of methods** – inheritance - overriding methods

UNIT III **(12 Hrs.)**

Interfaces: Multiple Inheritance: Introduction **-** Defining Interfaces - Extending interfaces- implementing interfaces - **Accessing interface variables** – packages - Introduction-using system packages-**java API packages**- creating packages-accessing a package- **multi threaded** – creating Thread- Life cycle of a Thread

UNIT IV **(11 Hrs.)**

Exception-Exception handling code- **multiple catch statements**-using finally statements- managing Input and Output files- Introduction – creation of files-Reading /Writing character- Reading/Writing bytes- **Concatenating and Buffering Files** – **Random Access File**

UNIT V **(12 Hrs)**

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

TEXTBOOKS

S.NO	AUTHOR	TITLE OF THE BOOK	YEAR OF PUBLICATION	PUBLISHERS\ EDITION

1.	E. Balaguruswamy	Programming with JAVA	2015	A Primer, Mc-Graw Hill Professional, 6th Edition

REFERENCE BOOKS

S.NO	AUTHOR	TITLE OF THE BOOK	YEAR OF PUBLICATION	PUBLISHERS\ EDITION
1.	R.G. Dromey	How to solve it by Computer	2008	Pearson Education, 3rd Edition
2.	Walter Savitch,	Java: An Introduction to Problem Solving and Programming	2019	Pearson Education Ltd, 8th Edition.
3.	Cay.S.Horstmann	Core Java Volume I—Fundamentals	2018	Pearson Education, 11th Edition.
4.	Herbert Schildt	Java: A Beginner's Guide	2018	McGraw Hill Education, 8th Edition.

PEDAGOGY

Chalk & Board, Lectures, Case Studies, Demonstrations

COURSE DESIGNERS

1. Dr. S. Meera
2. Mrs. M. Loganayaki

Course Number	Course Name	Category	L	T	P	Credit
AI24CP1	JAVA PROGRAMMING LAB	Practical	-	-	45	2

PREAMBLE

This course provides hands-on training to implement Object Oriented programming concept using basic syntaxes of control Structures, strings and functions It demonstrates inheritance, interfaces and packages It also explores different exception handling mechanisms and concept of multithreading.

PREREQUISITE

Basics of programming
Object oriented principles

COURSE LEARNING OUTCOMES

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the logic for the given problem, recognize and understand the syntax and construct JAVA code	K1
CLO2	Understand the java programming constructs and methods	K2
CLO3	Apply OOPs concepts and implement java programs	K3
CLO4	Analyse and implement advanced java programming techniques	K4

MAPPING WITH PROGRAMME LEARNING OUTCOMES

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1	M	M	S	S	L	L
CLO2	M	M	S	M	M	S
CLO3	S	M	M	S	S	M
CLO4	M	M	S	S	L	S

S- Strong; M-Medium; L-Low

LIST OF EXERCISES:

1. Exercises using classes and objects
2. Exercises using control statements
3. Exercises using different inheritance
4. Exercises using interfaces
5. Exercises using packages
6. Exercises using string functions
7. Exercises using mouse events
8. Exercises using thread methods
9. Exercises to implement Exception Handling
10. Exercises to implement files using Read and Write methods

PEDAGOGY

Demonstrations

COURSE DESIGNERS

1. Dr.S.Meera
2. Mrs Loganayaki. M

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 young minds to think like computer scientists 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 behaviour 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, and problem-solving in computational thinking	K1
CLO2	Understanding the applications of propositional logic, problem representation, and techniques	K2
CLO3	Apply algorithmic thinking to problem-solving using tools	K3
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	PLO6
CLO1	M	S	S	S	S	S
CLO2	S	S	S	M	S	S
CLO3	S	M	S	S	S	S
CLO4	S	S	M	S	S	S

S - Strong; M - Medium; L – Low

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: Flow Algorithm 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

TEXTBOOKS

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

PEDAGOGY

Lectures, Group discussions, Demonstrations, Case studies

1 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	PLO5
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

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, Gagne	Operating System Concepts	Wiley Publishers.	10th Edition, 2018
2	Christopher Negus	LINUX Bible	Wiley Publishers	10th 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	2nd Edition, 2011
2	Williams E. Shotts	The Linux Command Line: A Complete Introduction	John Wiley & Sons	2nd Edition, 2019
3	Jason Cannon	Linux for Beginners	Create space Independent Pub	1st Edition, 2014

Pedagogy

Lectures, Group discussions, Demonstrations, Case studies

Course Designers

- Mrs.T.S.Anushya Devi
- Dr.R.Suriyagrace