CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A+' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG DEPARTMENT OF INFORMATION TECHNOLOGY

B.Sc. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

SYLLABUS

2026 -2027 Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

The department of Information Technology envisions to create technically competent, skilled intellectual IT professionals, efficient problem solvers, innovators and entrepreneurs to meet the current challenges of the modern computing industry.

MISSION

- To provide quality education and elevate the students towards higher educational Programs
- To encourage and guide the students to improve their competency skills in information technology market
- To equip the students to cater the industrial demands through providing advance training

Cauvery College for Women (Autonomous)

B.Sc Artificial Intelligence and Machine Learning

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (CBCS –LOCF)

(For the Candidates admitted from the Academic year 2025-2026 and onwards)

PSO NO	Programme Specific Outcomes Students of B.Sc. Artificial Intelligence and Machine Learning will be able to	POs Addressed
PSO1	Analyze problems, identify key requirements, and define clear specifications to develop effective solutions in par with the expected quality standards for Artificial Intelligence and Machine Learning professional.	PO1
PSO2	Utilize technical skills gained from lab exercises, projects, internships, and value-added programs to tackle complex and interdisciplinary challenges.	PO4
PSO3	Design, Analyze, Interpret and execute AI problems and draw actionable conclusions for strategic decision-making.	PO2
PSO4	Develop ground-breaking ideas in artificial intelligence and machine learning domain to implement real world applications	PO4
PSO5	Adapt to modern platforms to enhance employability, foster entrepreneurship, and pursue higher education opportunities effectively	PO3

PG DEPARTMENT OF INFORMATION TECHNOLOGY

B.Sc ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

CHOICE BASED CREDIT SYSTEM-LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2026-2027 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. /	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Ability Enhancement Course – I (AEC - I)	பொதுத் தமிழ்-I	26ULT1	6	3	3	30	70	100
			Hindi Language & Literature - I	26ULH1						
			Sanskrit Prose and Vocabulary	26ULS1						
			Basic French – I	26ULF1						
	II	Ability Enhancement Course – II (AEC - II)	General English - 1	26UE1	6	3	3	30	70	100
	III	Core Course – I(CC-I)	Programming in C	26UIT1CC1/ 26UAM1CC1 26UCS1CC1	5	5	3	30	70	100
		Core Practical - I (CP-I)	Programming in C(P)	26UAM1CP1	3	3	3	40	60	100
		Allied Course- I (AC-I)	Probability and Statistics	26UAM1AC1	3	3	3	30	70	100
		Allied Course Practical- I(ACP-I)	Statistical Techniques and Data Analysis using SPSS (P)	26UAM1ACP1	3	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course-I (AECC-I)	Value Education	26UGVE	2	2	-	100	-	100
		Ability Enhancement Compulsory Course-II (AECC-II)	Cyber Security	26UGCS	2	2	-	100	-	100
	Total				**30**	**24**				**800**

Semester I	Internal Mark: 30		External Mark: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26UIT1CC1/ 26UAM1CC1/ 26UCS1CC1	**PROGRAMMING IN C**	**CORE COURSE – I (CC)**	**5**	**5**

Course Objectives

- Introduce fundamentals of structured programming
- Develop logical and problem-solving skills
- Enable students to write efficient C programs

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values / Indian Knowledge System	Professional Ethics/ Sustainability
3	Course relevant to Local/Regional/National/Global needs	Global
4	Course focus on Sustainable Development Goals	SDG 4, 9, 8

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome	Cognitive Level
CO1	Understand fundamental concepts of C programming including data types, operators, and program structure.	K2
CO2	Apply control structures to develop logical and efficient programs for problem solving.	K3
CO3	Design and implement modular programs using functions and arrays	K4
CO4	Analyze and utilize pointers, structures, and strings for effective memory and data management	K4
CO5	Evaluate and optimize programs using file handling and dynamic memory allocation techniques	K5

Mapping of CO with PO and PSO

	PSO1	PSO 2	PSO3	PSO4	PSO5	PO1	PO2	PO 3	PO4	PO5
CO1	3	1	1	1	1	3	2	1	2	1
CO2	3	2	2	1	2	3	3	1	2	2
CO3	3	2	3	2	2	3	3	2	2	2
CO4	3	2	3	2	2	3	3	2	2	2
CO5	3	3	3	2	3	3	3	2	3	3

"1" – Slight (Low) Correlation "2" – Moderate (Medium) Correlation
"3" – Substantial (High) Correlation "-" indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Programming languages - History of Programming language - Algorithms - Flow charts - Language Translators - Overview of C: History of C- Importance of C- Basic Structure of C Programs- Executing a C Program- Keywords – Identifiers - Constants, Variables and Data types - Operators and Expressions – Type Conversion -Managing Input and Output Operations	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Decision Making and Branching:** Decision making with If, simple IF, IF ELSE, nested IF ELSE , ELSE IF ladder, switch, GOTO statement. Decision Making and Looping: While, Do-While, For, Jumps in loops. Arrays.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**User Defined Functions:** Elements of User Defined Functions- Definition of Functions- Return Values and their Types- Function Call- Function Declaration- Categories of Functions- Nesting of Functions- Recursion	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Character Arrays and Strings - Structures and Unions:** Introduction- Defining a Structure- Declaring Structure Variables Accessing Structure Members- Structure Initialization- Arrays of Structures- Arrays within Structures- Unions- Size of Structures - Type def	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
	Pointers: Understanding Pointers- Accessing the			

V	Address of a Variable- Declaring Pointer Variables- Initializing of Pointer Variables- Accessing a Variable through its Pointer- Pointer Arithmetic – Pointer with Array and function – Pointers with structures - **File Management in C – Dynamic Memory Allocation** - Bit level Programming	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self Study for Enrichment** (Not included for End Semester Examinations) Developing C Program Guidelines – Common Programming Errors – Program Testing and Debugging - Graphic Programming Using C	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbooks

1. E. Balaguruswamy, (2019), ―Programming in ANSI C‖, 8th Edition, Tata McGraw Hill Publications.
2. C programming for beginners (2021). Dr Madhav Bokare and Ms. Nishigandha Kurale Sankalp Publication.
3. Brian W. Kernighan & Dennis M. Ritchie(1998), *The C Programming Language* 2nd Edition, Pearson Education

References

1. **Yashavant Kanetkar (2020),*Let Us C,*16th Edition, BPB Publications**
2. **Stephen Prata (2015), *C Primer Plus,* 6th Edition, Pearson Education**
3. **Herbert Schild (2015), *C: The Complete Reference,* 4th Edition, McGraw Hill Education**
4. **Byron Gottfried (2018), *Programming with C,* 3rd Edition, Schaum's Outline Series, McGraw Hill**

Web References

1. https://www.geeksforgeeks.org/c-programming-language
2. https://www.programiz.com/c-programming
3. https://www.tutorialspoint.com/cprogramming
4. https://www.learn-c.org
5. https://www.codecademy.com/learn/learn-c

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. P.Tamilselvi, Associate Professor, Department of Information Technology.

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26UAM1CP1	**PROGRAMMING IN C (P)**	**CORE COURSE- I (CP)**	**3**	**3**

Course Objectives

- Develop hands-on programming skills in C
- Strengthen problem-solving and logical thinking
- Apply structured programming concepts in real-world tasks

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian knowledge Systems	Professional Ethics/ Sustainability
3	Course relevant to Local/Regional/National/Global needs	Global
4	Course focus on Sustainable Development Goals	SDG 4, 9, 8

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Interpret and apply the syntax and semantics of the C programming language to construct correct programs.	K3
CO2	Analyze computational problems and formulate algorithmic solutions using C programming techniques.	K4
CO3	Select and integrate appropriate programming constructs such as control structures, functions, and data structures for efficient problem solving.	K4
CO4	Evaluate various features of the C language to optimize program performance and resource utilization.	K5
CO5	Design, implement, debug, and validate C programs to solve real-world problems with accuracy and reliability.	K5

Mapping with Programme Outcomes

COs\ POs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1	3	2	1	2	1
CO2	3	2	2	1	2	3	3	1	2	2
CO3	3	2	3	2	2	3	3	2	2	2
CO4	3	2	3	2	3	3	3	2	2	3
CO5	3	3	3	2	3	3	3	2	3	3

"1" – Slight (Low) Correlation **"2" – Moderate (Medium) Correlation**
"3" – Substantial (High) Correlation **"-" indicates there is no correlation.**

Lab Exercises

1. Programs on conditional structures
2. Programs using Looping structures
3. Programs using Arrays
4. String Manipulations
5. Programs using Functions
6. Recursive Functions
7. Implement Files by using Structures
8 Simple programs on Pointers
9. Implement a program using various Dynamic memory allocation constructs
10.Program to implement various Bitwise operators.

Text Book

1. E. Balagurusamy, Programming in ANSI C, Fifth Edition, Tata McGraw-Hill, 2010.

Reference Books

1. Byron Gottfried, Schaum's Outline Programming with C, Fourth Edition, Tata McGraw-Hill, 2018.

2. Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998.

3. Yashavant Kanetkar, Let Us C, Eighteenth Edition, BPB Publications, 2021

Web References

1. https://www.tutorialspoint.com/cprogramming
2. https://www.javatpoint.com/c-programming-language-tutorial
3. https://www.w3schools.in/category/c-tutorial

Course Designer

Dr. P.Tamilselvi, Associate Professor, Department of Information Technology

ALLIED COURSE – I (AC - I)
PROBABILITY AND STATISTICS
(2026-2027 Onwards)

Semester I	Internal Marks: 30		External Marks: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs /Week**	**CREDITS**
26UAM1AC1	**PROBABILITY AND STATISTICS**	**ALLIED**	**3**	**3**

Course Objective

- **Define** the notion of probability and statistical averages.
- **Explore** the fundamental concepts of sampling theory and tests of significance of small samples.
- **Apply** the idea of design of experiments and statistical quality control in various fields.

S. No.	Course Features	Relevance Status
1.	Course emphasis on Statistical Analysis / Data Interpretation / Problem Solving / Analytical Skill Development / Employability	Employability, Skill Development, Research
2.	Course integrates cross-cutting issues relevant to Professional Ethics in Data Handling / Research Integrity / Environmental & Social Data Analysis	Professional Ethics, Environment & Sustainability
3.	Course relevant to Local / Regional / National / Global needs in Research, Industry, Healthcare, Agriculture, Finance and Quality Control	Global Need
4.	Course focus on Sustainable Development Goals (SDG 3, 4, 8, 9, 12) through statistical methods supporting policy making, economic planning, public health and sustainable production	SDG 4, 8, 9, 12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define Probability, Statistical averages, Sampling tests, Design of experiments and Statistical quality control.	K1
CO2	Explain the basic concepts of Probability, Statistical averages, Sampling tests, Design of experiments and Statistical quality control.	K2
CO3	Apply the various concepts of Probability, Statistical averages, Sampling tests, Design of experiments and Statistical quality control for solving the problems.	K3
CO4	Solve the problems using Probability, Statistical averages, Sampling tests, Design of experiments and Statistical quality control.	K3
CO5	Examine the given data and interpret the results.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	2	3	3	2	3
CO3	3	3	3	3	3	2	3	2	3	3
CO4	3	3	3	3	3	3	3	2	2	3
CO5	3	3	3	3	3	3	2	3	3	3

"1" – Slight (Low) Correlation ¬ "2" – Moderate (Medium) Correlation ¬

"3" – Substantial (High) Correlation ¬ "-" indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	**Probability Theory** Mathematical or Apriori Definition of Probability – Statistical or Aposteriori Definition of probability – Axiomatic Definition of Probability – Conditional Probability – Independent Events – Theorem of Total Probability – Baye's Theorem of Probability of Causes. (Definitions, Statement of the Theorems and simple problems only).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Statistical Averages** Linear Correlation – Correlation Coefficient – Properties of Correlation Coefficient – Rank Correlation Coefficient – Regression – Equation of the Regression Line of Y on X. (Definitions, Statement of the Theorems and simple problems only).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Test of Hypotheses** Tests of Significance for Small Samples – Student's t-Distribution – Snedecor's F-Distribution – Chi-square Distribution – Chi-Square Test of Goodness of Fit – Chi-Square Test of Independence of Attributes. (Simple Problems only).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**Design of Experiments** Some Basic Designs of Experiment: Completely Randomised Design (CRD) – Randomised Block Design (RBD) – Latin Square Design (LSD). (Problems only).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Statistical Quality Control** Introduction – Control Charts for Attributes. (Problems only).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

VI	**Self Study for Enrichment:** **(Not included for End Semester Examinations)** Bernoulli's Trials – Standard Error of Estimate of Y – Tests of Significance of Large Samples – Comparison of RBD and LSD – Note on Simplification of Computational Work.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

Veerarajan T. (2016). *Probability, Statistics and Random Processes with Queueing Theory and Queueing Networks (4th Edition, Third Reprint).* McGraw Hill Education (India) Private Limited, New Delhi.

Chapters and Sections

UNIT-I Chapter 1: Pages 1.1 – 1.23
UNIT-II Chapter 4: Pages 4.17 – 4.47
UNIT-III Chapter 10: Pages 10.30 – 10.66
UNIT- IV Chapter 11: Pages 11.2 – 11.25
UNIT- V Chapter 12: Pages 12.1 – 12.30

Reference Books

1. Richard A.Johnson, Irwin Miller and John Freund. (2017). *Miller & Freund's Probability and Statistics for Engineers (Fifth Impression).* Pearson India Education Services Pvt.Ltd.
2. Gupta. S. P. (2017). *Statistical Methods (45th Edition)*. Sultan Chand & Sons, New Delhi.
3. Bhishma Rao.G.S.S. (2011). *Probability and Statistics*. Scitech Publications (India) Pvt. Ltd..

Web References

1. **https://youtu.be/c18FKHUDZv8**
2. **https://youtu.be/ZoaUu6iRE64**
3. **https://youtu.be/71oNiqPoKD8**
4. **https://youtu.be/xTpHD5WLuoA**
5. **https://tinyurl.com/yb57hh5e**
6. **https://tinyurl.com/h3nbyj35**
7. **https://rb.gy/muaxp**

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Vidhya

ALLIED COURSE PRACTICAL – I (ACP-I)
STATISTICAL TECHNIQUES AND DATA ANALYSIS USING SPSS(P)
(For B.Sc Artificial Intelligence and Machine Learning)
(2026-2027 Onwards)

Semester I	Internal Marks: 40	External Marks: 60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs /Week**	**CREDITS**
26UAM1ACP1	**STATISTICAL TECHNIQUES AND DATA ANALYSIS USING SPSS(P)**	**ALLIED COURSE PRACTICAL**	**3**	**3**

Course Objectives

- **Understand** the statistical concepts underlying correlation, regression, hypothesis testing, design of experiments, and statistical quality control through practical implementation in SPSS.
- **Perform** statistical analyses such as t-tests, ANOVA, Chi-square tests, regression models, and control charts using SPSS software.
- **Interpret** SPSS output tables and draw meaningful statistical conclusions based on the results obtained from real datasets.

S. No	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability, Entrepreneurship, Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender sensitization/ Environment and Sustainability/ Human Values	Professional Ethics, Human Values
3	Course relevant to Local/Regional/National/ Global need	Global need
4	Course focus on Sustainable Developmental Goal	SDG 4, 8, 9, 12

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the basic concepts of correlation, regression, hypothesis testing, design of experiments, and statistical quality control using SPSS.	**K1**
CO2	Explain the procedures involved in performing statistical analyses such as t-test, ANOVA, Chi-square test, and regression using SPSS.	**K2**
CO3	Apply SPSS tools to analyze data using correlation, regression, hypothesis testing, and experimental design techniques.	**K3**
CO4	Perform statistical tests and generate appropriate SPSS outputs for interpreting real-life data.	**K3**
CO5	Examine SPSS output tables and interpret results to draw valid statistical conclusions.	**K4**

Mapping of CO with POs and PSOs

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	1	3	1	2	1	1
CO2	2	3	2	2	1	2	2	3	2	1
CO3	2	2	3	3	2	2	3	2	2	2
CO4	2	2	3	3	2	2	3	2	3	2
CO5	1	2	3	2	3	2	2	2	2	3

"1" – Slight (Low) Correlation "2" – Moderate (Medium) Correlation
"3" – Substantial (High) Correlation "-" indicates there is no correlation.

LIST OF PROGRAMS

1. **Karl Pearson's Correlation Coefficient**
2. **Spearman Rank Correlation Coefficient**
3. **Scatter Plot with Correlation Interpretation**
4. **Simple Linear Regression**
5. **Multiple Linear Regression**
6. **One Sample t-test**
7. **Independent Samples t-test**
8. **Paired Sample t-test**
9. **One Way ANOVA (F-test)**
10. **Two Way ANOVA (Completely Randomized Design - CRD)**
11. **Randomized Block Design (RBD)**
12. **Latin Square Design (LSD)**
13. **Chi-Square Test of Goodness of Fit**
14. **Chi-Square Test of Independence**
15. **Control Charts for Attributes (p-chart and c-chart)**

Web References

1. **https://www.youtube.com/watch?v=HrwYsjuR4R0**
2. **https://www.youtube.com/watch?v=Dz8m30hwlH4**
3. **https://www.classcentral.com/course/youtube-working-with-spss-91118**
4. **https://www.classcentral.com/course/youtube-spss-tutorial-for-data-analysis-spss-for-beginners-part-2-111748**
5. **https://www.classcentral.com/course/youtube-spss-91773**
6. **https://www.onlinespss.com/spss-video-tutorials/**
7. **https://www.onlinespss.com/how-to-run-a-statistical-analysis-in-spss/**

Pedagogy

Power Point presentations, Live Demo, Hands on training.

Course Designer

Dr. C. Saranya