CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH A^{+} GRADE BY NAAC

TIRUCHIRAPPALLI

PG DEPARTMENT OF INFORMATION TECHNOLOGY

B. Sc. INFORMATION TECHNOLOGY

SYLLABUS

2026-2027 and 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

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	**LEARNING ENVIRONMENT** To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	**ACADEMIC EXCELLENCE** To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	**EMPLOYABILITY** To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	**PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY** To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	**GREEN SUSTAINABILITY** To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc. INFORMATION TECHNOLOGY PROGRAMME

PO NO.	Programme Outcome On completion of B.Sc. Information Technology The students will be able to
PO1	**Academic Skills & Social Responsibility** Apply Computing, Mathematical and Scientific knowledge in various disciplines by understanding the concerns of the society.
PO2	**Critical Thinking and Innovative Progress** Design the software applications with varying intricacies using programming languages for innovative learning in techno world to meet the changing demands.
PO3	**Personality Development** Perceive Leadership skills to accomplish a common goal with effective communication and understanding of professional, ethical, and social responsibilities.
PO4	**Lifelong Learning** Identify resources for Professional development and apply the skills and tools necessary for computing practice to gain real life experiences.
PO5	**Creativity and Holistic Approach** Create a Scientific temperament and novelties of ideas to support research and development in Computer Science to uphold scientific integrity and objectivity.

PROGRAMME SPECIFIC OUTCOMES FOR

B.Sc. INFORMATION TECHNOLOGY PROGRAMME

PSO No.	Programme Specific Outcomes Students of B.Sc. Information Technology will be able to	POs Addressed
PSO1	To apply the knowledge of Science and Computing in Information Technology	PO1
PSO2	Analyze the local and global impact of computing on individuals, organizations, society and implant lifelong learning for professional development	PO1 PO2
PSO3	Improve the capability to apply the knowledge in interrelated domains and solve real world problems with modern technological tools	PO2 PO3
PSO4	To strengthen the academic quality, effective communication, good ethics and responsibilities during professional practice	PO3 PO4
PSO5	Excel in job oriented skills which are required to meet the current demand in the field of IT industry and to become an entrepreneur with confidence	PO4 PO5

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF INFORMATION TECHNOLOGY

B.Sc Information Technology

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)	பொதுத்தமிழ்-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 - I	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)	26UIT1CP1	3	3	3	40	60	100
		Allied Course- I (AC-I)	Numerical Methods	26UIT1AC1	3	3	3	30	70	100
		Allied Course Practical- I(ACP-I)	Numerical Methods using MATLAB(P)	26UIT1ACP1	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**
26UIT1CP1	**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 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	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. Develop programs using conditional statements and looping constructs.
2. Implement basic computational programs using built-in mathematical functions and user-defined functions.
3. Develop programs using recursive functions for mathematical and logical problems.
4. Perform operations on one-dimensional and two-dimensional arrays.
5. Implement searching and sorting techniques using arrays.
6. Develop programs for string manipulation with and without built-in functions.
7. Create programs using structures to manage simple data records.
8. Implement pointer-based programs for swapping values
9. Develop programs using dynamic memory allocation techniques.
10. Create file handling programs to store, retrieve, and update data.

Textbooks

1. E. Balaguruswamy, (2019), ―Programming in ANSI C‖, 8th Edition, Tata McGraw Hill Publications.
2. Brian W. Kernighan & Dennis M. Ritchie(1998), *The C Programming Language* 2nd Edition, Pearson Education

Reference Books

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

Demo

Course Designer

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

ALLIED COURSE –I (AC-I)

NUMERICAL METHODS

(For B.Sc. Computer Science, Information Technology, Computer Science with Cognitive Systems)

(2026-2027 Onwards)

Semester I	Internal Marks: 30			ExternalMarks:70
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs / Week**	**CREDITS**
26UCS1AC1/ 26UIT1AC1/ 26UCG1AC1	**NUMERICAL METHODS**	**ALLIED COURSE**	**3**	**3**

Course Objective

- **Learn** the various topics in Numerical methods.
- **Understand** the fundamentals of algebraic equations, interpolation, numerical differentiation and integration.
- **Develop** skills in solving problems of numerical techniques.

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 /Indian Knowledge System	Professional Ethics
3.	Course relevant to Local/Regional/National/ Global needs	Global need
4.	Course focus on Sustainable Developmental Goals	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	Remember the basic concepts of numerical methods.	K1
CO2	Illustrate the various notions of computational numerical streams	K2
CO3	Apply the different techniques of numerical problems	K3
CO4	Classify the methods of numerical techniques.	K4
CO5	Examine the solutions of numerical problems.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	SO3	SO4	SO5	O1	O2	O3	O4	O5
CO1	3	2	3	3	3	3	3	2	2	3
CO2	3	2	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	3	3	2	2

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

"3" – Substantial (High) Correlation "-" indicates there is nocorrelation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**Solution of Algebraic and Transcendental Equations:** Introduction – Bisection Method –The Iteration Method – The Method of False Position – Newton Raphson Method. (Simple Problems Only).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Interpolation:** Finite differences – Forward differences – Backward differences – Central differences – Newton's Formulae for interpolation–Interpolation with Unevenly Spaced Points – Lagrange's Interpolation Formula. (Simple Problems Only)	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Numerical Differentiation and Integration:** Introduction – Numerical Differentiation – Numerical Integration – Trapezoidal Rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule (Simple Problems Only)	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**Numerical Linear Algebra:** Solution of Linear Systems – Direct Methods – Gauss - Elimination – Gauss -Jordan method. Solution of Linear Systems – Iterative Methods. (Simple Problems Only)	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Numerical Solution of Ordinary Differential Equations:** Introduction – Solution by Taylor's Series – Euler's Method – Modified Euler's Method – Runge-Kutta Method–Predictor-Corrector Methods – Adams-Moulton Method – Milne's Method(Simple Problems Only)	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**Self-Study for Enrichment** **(Not included for End Semester Examination)** Ramanujan's Method – Bessel's Formula – NewtonCotes Integration Formulae –The QR Method – Picard's Method of Successive Approximations	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

Sastry.S.S (2004), Introductory Methods of Numerical Analysis (Third Edition), Prentice Hall of India Private Ltd, New Delhi.

Chapters and Sections

UNIT–I	Chapter 2: Sections: 2.1 – 2.5 (Omit 2.3.1 & 2.5.1)
UNIT II	Chapter 3: Sections: 3.3 : 3.3.1 – 3.3.3, 3.6, 3.9 : 3.9.1
UNIT-III	Chapter 5: Sections: 5.1, 5.2 (only), 5.4 : 5.4.1 – 5.4.3
UNIT-IV	Chapter 6: Sections: 6.3: 6.3.2, 6.4
UNIT-V	Chapter 7: Sections: 7.1,7.2, 7.4: 7.4.2, 7.5,7.6

Reference Books

1. Venkataraman, M.K. (2003). Numerical Methods in Science and Engineering, The National Publishing Company.
2. Iyengar S.R.K, Jain R.K, (2009). Numerical Methods, New Age International Publishers.
3. Kandasamy P, Thilagavathy K & Gunavathi K (2016). Numerical Methods, S. Chand & Company Pvt. Ltd., Ram Nagar, New Delhi.

Web References

1. https://csw.uobaghdad.edu.iq/wp-content/uploads/sites/30/uploads/computer%20science/Lectures/2nd%20year/NUM%20ANALYSIS.pdf
2. https://www.youtube.com/watch?v=3j0c_FhOt5U&list=PLU6SqdYcYsfIk1VhXxIYNPFU67ym6gae8
3. https://www.msuniv.ac.in/images/distance%20education/learning%20materials/ug%20pg/ug//bsc_maths/II%20Year%20-%20DJM2C%20-%20Numerical%20Methods.pdf
4. https://www.ece.mcmaster.ca/~xwu/part6.pdf
5. https://www.youtube.com/watch?v=iviiGB5vxLA
6. https://www.youtube.com/watch?v=Gkit1hUTsX8
7. https://homepage.math.uiowa.edu/~atkinson/papers/NAODE_Book.pdf

Pedagogy

Power point Presentations, Group Discussions, Seminar, Quiz, Assignment and Smart Classroom.

Course Designer

Ms. P. Sangeetha

ALLIED COURSE PRACTICAL-I (ACP-I)
NUMERICAL METHODS USING MATLAB(P)
(For B.Sc. Computer Science, Information Technology, Computer Science with Cognitive Systems)
(2026-2027 and Onwards)

Semester I	Internal Marks: 40		External Marks:60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs / Week**	**CREDITS**
26UCS1ACP1/ 26UIT1ACP1/ 26UCG1ACP1	**NUMERICAL METHODS USING MATLAB(P)**	**ALLIED COURSE PRACTICAL-I**	**3**	**3**

Course Objective

- Recognize how different numerical analysis techniques are applied.
- Compile and arrange the numerical information.
- Analyze and assess the data-based findings strengths.

S.No.	Course Features	Reference 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
3.	Course relevant to Local/Regional/National/Global needs	National, Global Need
4.	Course focus on Sustainable Development Goals	Sustainable Development Goal 4,8,9,12

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	**Understand** the programming skills through numerical methods using MATLAB.	K1, K2
CO2	**Solve** the problems using various numerical methods using MATLAB.	K2, K3
CO3	**Identify** the techniques of Numerical Methods	K3
CO4	**Analyze** the basic commands in MATLAB programming.	K4
CO5	**Support** the implementation of numerical methods using MATLAB.	K4

Mapping of COs with POs and PSOs

COs	PSO1	SO2	SO3	SO4	SO5	O1	O2	O3	O4	O5
CO1	3	3	3	3	3	3	3	2	3	2
CO2	3	3	2	2	2	3	2	3	2	3
CO3	2	3	3	2	2	2	3	3	2	3
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	2	3	3	3	2	2	3	3

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

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

LIST OF PROGRAMS

1. Bisection Method
2. Trapezoidal rule of Integration
3. Simpson's 1/3 rule of Integration
4. Simpson's 3/8 Rule of Integration
5. Newton – Raphson method of solving equations
6. Linear Interpolation
7. Linear Regression
8. Gauss Elimination method of solving simultaneous equations
9. Gauss – Seidal method of solving simultaneous equations
10. R-K fourth order method of solving differential equations
11. Euler's Method of solving differential equations
12. Lagrange's method of interpolation

Web References

1. https://www.youtube.com/watch?v=eV_JDYaW9Jo
2. https://www.mathworks.com/help/matlab/data_analysis/linear-regression.html
3. https://www.codewithc.com/bisection-method-in-matlab/?amp=1
4. https://www.geeksforgeeks.org/software-engineering/trapezoidal-numerical-integration-in-matlab/
5. https://www.youtube.com/watch?v=tD2mBVjbSo
6. https://www.youtube.com/watch?v=zzdCcpqCcJA
7. https://www.youtube.com/watch?v=C76p31T-Y5s
8. https://www.scribd.com/document/498648310/gauss-elimination-method-using-matlab
9. https://lpsa.swarthmore.edu/NumInt/NumIntFourth.html
10. https://www.youtube.com/watch?v=9P5J5spULJs

Pedagogy

Power point presentations, Live Demo, Hands on Training.

Course Designer

Dr. V.Manimozhi