

SRI SARADA COLLEGE FOR WOMEN (AUTONOMOUS)

Reaccredited with “B++” Grade by NAAC

(Affiliated to Periyar University)

SALEM – 16



PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM (CBCS)

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK

(LOCF)

B.Sc. COMPUTER SCIENCE

2026-2029 BATCH

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1. INTRODUCTION

Education is the key to development of any society. Role of higher education is crucial for securing right kind of employment and also to pursue further studies in best available world class institutes elsewhere within and outside India. Quality education in general and higher education in particular deserves high priority to enable the young and future generation of students to acquire skill, training and knowledge in order to enhance their thinking, creativity, comprehension and application abilities and prepare them to compete, succeed and excel globally. Learning Outcomes-based Curriculum Framework (LOCF), which makes it student- centric, interactive and outcome-oriented with well-defined aims, objectives and goals to achieve. LOCF also aims at ensuring uniform education standard and content delivery across the state which will help the students to ensure similar quality of education irrespective of the institute and location.

Computer Science is the study of quantity, structure, space and change, focusing on problem solving, application development with wider scope of application in science, engineering, technology, social sciences etc. throughout the world in last couple of decades and it has carved out a space for itself like any other disciplines of basic science and engineering. Computer science is a discipline that spans theory and practice and it requires thinking both in abstract terms and in concrete terms. Nowadays, practically everyone is a computer user, and many people are even computer programmers. Computer Science can be seen on a higher level, as a science of problem solving and problem solving requires precision, creativity, and careful reasoning. The ever-evolving discipline of computer science also has strong connections to other disciplines. Many problems in science, engineering, health care, business, and other areas can be solved effectively with computers, but finding a solution requires both computer science expertise and knowledge of the particular application domain. Computer science has a wide range of specialties. These include Computer Architecture, Software Systems, Artificial Intelligence, Computational Science, and Software Engineering. Drawing from a common core of Computer Science knowledge, each specialty area focuses on specific challenges. Computer Science is practiced by mathematicians, scientists and engineers. Mathematics, the origins of Computer Science, provides reason and logic. Science provides the methodology for learning and refinement. Engineering provides the techniques for building hardware and software.

2.LEARNING OUTCOME -BASED CURRICULUM FRAMEWORK GUIDELINES BASED REGULATIONS FOR UNDER GRADUATE PROGRAMME	
Programme:	B.Sc. Computer Science
Programme Code:	UCSC
Duration:	3 years [UG]
Programme Outcomes:	PO1 : Scientific aptitude will be developed in Students PO2 : Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the Computer Science & humanities stream. PO3 : Students will become employable; Students will be eligible for career opportunities in education field, Industry, or will be able to opt for entrepreneurship. PO4 : Students will possess basic subject knowledge required for higher studies, professional and applied courses. PO5: Students will be aware of and able to develop solution oriented approach towards various Social and Environmental issues. PO6: Ability to acquire in-depth knowledge of several branches of Computer Science and aligned areas. This Programme helps learners in building a solid foundation for higher studies in Computer Science and applications. PO7: The skills and knowledge gained leads to proficiency in analytical reasoning, which can be utilized in modelling and solving real life problems. PO8: Utilize computer programming skills to solve theoretical and applied problems by critical understanding, analysis and synthesis. PO9: To recognize patterns and to identify essential and relevant aspects of problems. PO10 : Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others. PO11 : Mould the students into responsible citizens in a rapidly changing interdependent society.

3.LEARNING OUTCOME -BASED CURRICULUM FRAMEWORK GUIDELINES BASED REGULATIONS FOR UNDER GRADUATE PROGRAMME

Programme:	B.Sc. Computer Science
Programme Code:	UCSC
Duration:	3 years [UG]
Programme Specific Outcomes:	PSO1: Think in a critical and logical based manner. PSO2: Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve problems in mathematics or Statistics and real-time application related sciences. PSO3: Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand. PSO4: Understand, formulate, develop programming model with logical approaches to an Address issues arising in social science, business and other contexts. PSO5: Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of Computer science and Industrial statistics. PSO6: Provide students/learners sufficient knowledge and skills enabling them to undertake further studies in Computer Science or Applications or Information Technology and its allied areas on multiple disciplines linked with Computer Science. PSO7: Equip with Computer science technical ability, problem solving skills, creative talent and power of communication necessary for various forms of employment. PSO8:Develop a range of generic skills helpful in employment, internships & Social activities. PSO9: Get adequate exposure to global and local concerns that provides platform for further exploration into multi-dimensional aspects of computing sciences.

4. Highlights of the Revamped Curriculum

- Student-centric, meeting the demands of industry & society, incorporating industrial components, hands-on training, skill enhancement modules, industrial project, project with viva-voce, exposure to entrepreneurial skills, training for competitive examinations, sustaining the quality of the core components and incorporating application-oriented content wherever required.
- The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics, practical training, devising mathematical models and algorithms for providing solutions to industry / real life situations. The curriculum also facilitates peer learning with advanced mathematical topics in the final semester, catering to the needs of stakeholders with research aptitude.
- The General Studies and Computer Science based problem solving skills are included as mandatory components in the 'Training for Competitive Examinations' course at the final semester, a first of its kind.
- The curriculum is designed so as to strengthen the Industry-Academia interface and provide more job opportunities for the students.
- The Internship during the second year vacation will help the students gain valuable work experience that connects classroom knowledge to real world experience and to narrow down and focus on the career path.
- Project with viva-voce component in the fifth semester enables the student, application of conceptual knowledge to practical situations. Such innovative provisions of the industrial training, project and internships will give students an edge over the counterparts in the job market.
- State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature are incorporated as Elective courses, covering conventional topics to the latest - Statistics with R Programming, Data Science, Machine learning, Internet of Things and Artificial Intelligence etc.

Value additions in the Revamped Curriculum:

Semester	Newly introduced Components	Outcome / Benefits
I	Foundation Course To ease the transition of learning from higher secondary to higher education, providing an overview of the pedagogy of learning abstract Mathematics and simulating mathematical concepts to real world.	• Instil confidence among students • Create interest for the subject
I, II, III, IV	Skill Enhancement papers (Discipline centric / Generic / Entrepreneurial)	• Industry ready graduates • Skilled human resource • Students are equipped with essential skills to make them employable
		• Training on Computing / Computational skills enable the students gain knowledge and exposure on latest computational aspects
		• Data analytical skills will enable students gain internships, apprenticeships, field work involving data collection, compilation, analysis etc.
		• Entrepreneurial skill training will provide an opportunity for independent livelihood • Generates self-employment • Create small scale entrepreneurs • Training to girls leads to women empowerment • Discipline centric skill will improve the Technical • knowhow of solving real life problems using ICT tools

III, IV, V & VI	Elective papers- An open choice of topics categorized under Generic and Discipline Centric	- Strengthening the domain knowledge - Introducing the stakeholders to the State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature - Students are exposed to Latest topics on Computer Science / IT, that require strong mathematical background - Emerging topics in higher education / industry / communication network / health sector etc. are introduced with hands-on-training, facilitates designing of mathematical models in the respective sectors
II year Vacation activity	Internship / Industrial Training	Practical training at the Industry/ Banking Sector / Private/ Public sector organizations / Educational institutions, enable the students gain professional experience and also become responsible citizens.
V Semester	Project with Viva voce	- Self-learning is enhanced - Application of the concept to real situation is conceived resulting in tangible outcome
VI Semester	Introduction of Professional Competency component	- Curriculum design accommodates all category of learners; Mathematics for Advanced Learners and the component will comprise of advanced topics in Mathematics and allied fields, for those in the peer group / aspiring researchers; ‘Training for Competitive Examinations’ –caters to the needs of the aspirants towards most sought - after services of the nation viz, UPSC, CDS, NDA, Banking Services, CAT, TNPSC group services, etc.
Extra Credits: For Advanced Learners / Honors degree		To cater to the needs of peer learners / research aspirants
Skills acquired from the Courses		Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill.

5. Credit Distribution for UG Programme

[illegible]

6. Consolidated Semester-wise and Component-wise Credit distribution

Parts	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Total Credits
Part I	3	3	3	3	-	-	12
Part II	3	3	3	3	-	-	12
Part III	13	12	13	13	22	18	91
Part IV	4	5	4	6	4	3	26
Total	23	23	23	25	26	21	141

*Part I, II, and Part III components will be separately taken into account for CGPA calculation and classification for the under graduate programme and the other components. IV have to be completed during the duration of the programme as per the norms, to be eligible for obtaining the UG degree.

Total - 141 Credits

EXTRA CREDITS FOR EXTRA SKILLS

Total Extra Credits - 28 (20% of the total credits)

7. CURRICULUM DESIGN AND SCHEME OF EXAMINATION

B.Sc. Computer Science
(For the students admitted in 2025-26)
Total Credits: 140 + 1 + Extra Credits (Maximum 28)

I SEMESTER

Part	Course Code	Course Title	Course Type	Hrs./ Week L/T/P	Credits	CIA	ESE	Total
I	26ULTC1/ 26ULHC1/ 26ULSC1	Tamil – I Hindi - I Sanskrit – I	Language	6	3	30	70	100
II	26ULEC1	English – I	General English	6	3	30	70	100
III	26UCSCC1	Python Programming with Ethical AI Practices	Core Course - I	5	5	30	70	100
III	26UCSCCQ1	Python Programming -Practical	Core Course - II	4	3	40	60	100
III	26UCSMGEC1	Numerical Methods	Elective - I (GE): Generic Course	5	5	30	70	100
IV	26UCSSECQ1	NME: Office Automation – Practical	Skill Enhancement Course – I	2	2	40	60	100
IV	26UCSSEFC	Problem Solving Techniques	Skill Enhancement (Foundation Course)	2	2	30	70	100
Total				30	23			
	*Extra Skills (Out of College Hours)				*Credits		*Marks	
V	Articulation and Idea Fixation				-		-	
	Physical Fitness Practice				-		-	
	Society Connect Activity				-		-	

***Extra credits are given for extra skills and courses qualified in MOOC / NPTEL**

PEDAGOGICAL APPROACHES

TEACHING LEARNING STRATEGIES

- a) Chalk and talk
- b) Group -Learning and Teaching
- c) Individual Learning /Self-Study
- d) Game Based Learning
- e) Technology Based Learning
- f) Peer Teaching
- g) Learning Through Problem solving
- h) Project Based Learning

8. METHODS OF EVALUATION AND ASSESSMENT

Methods of Evaluation-Theory		
Internal Evaluation	Continuous Internal Assessment Test	30 Marks
	Assessment Components	
	Model Examination and Attendance	
External Evaluation	End Semester Examination	70 Marks
	Total	100 Marks
Methods of Evaluation-Practical		
Internal Evaluation	Laboratory work assessment (best 2 out of 3)	40 Marks
	Viva voce / Lab quiz, Class Performance	
External Evaluation	End Semester Examination	60 Marks
	Record	
	Total	100 Marks
REVISED BLOOMS LEVEL		
BL1	Exhibits memory of previously learned material by recalling fundamental facts, terms, basic concept and answers about the selection.	
BL2	Demonstrate understanding of parts and Idea free organizing, comparing, translating, interpreting, giving descriptors and stating main ideas.	
BL3	Solve problems in new situation by applying acquired knowledge, facts, techniques and rules in different or new way.	
BL4	Examine and break information into parts by identifying motives or causes. Make inference and find evidence to support generalizations.	
BL5	Present and depend opinion by making judgement about information, validity of ideas or quality of work based on a set of criteria.	
BL6	Compile information together into different way by combining elements in a new pattern or proposing alternative solutions.	

Evaluation Pattern

An academic year is divided into two semesters. The first semester is from June/July to November/December and the second semester is from November/December to April/May. A semester consists of 90 working days.

Evaluation consists of both Continuous Internal Assessment (CIA) and End Semester Examinations (ESE). The entire Undergraduate and Postgraduate Programmes offered by our college have various assessments for continuous internal evaluation. Relevant types of internal assessment are developed suiting the needs and requirements of each specific course. The various assessment components are quiz, snap test, viva-voce, seminar, listening comprehension, reading comprehension, problem solving, map reading, group discussion, panel discussion, assignment, field visit, poster presentation, open book test, writing composition, case study, online test, Book Review, Projects etc.

The CIA marks are read out and signed by the students in the respective classes on the day specified in the calendar. CIA is mandatory for all the students.

Internal Assessment Modes (Theory Course)

Any six of the assessment components	15 marks
Cycle Test (2)	5 marks
Model Examination	5 marks
Attendance	5 marks
Total	30 marks

Internal Assessment Modes (Practical Course)

Laboratory work assessment (best 2 out of 3)	20 marks
Viva voce/ Lab quiz	10 marks
Class Performance	10 marks
Total	40 marks

Society Connect Project (UG & PG)

Project Assessment	10 marks
Presentation and feedback from the society	10 marks
Participation in discussion	10 marks
Total	30 marks

Internal Assessment Modes (Project)

Project Assessment	15 marks
Participation in discussion	10 marks
Presentation	5 marks
Total	30 marks

PASSING MINIMUM

The candidate shall be declared to have passed the examination if the candidates secure not less than 28 marks out of 70 marks in the semester examination in each theory course and in total (CIA mark + Theory ESE) not less than 40 marks.

The candidates shall be declared to have passed the examination if she secures not less than 40 marks in total (CIA mark + Practical Exam mark) with minimum of 25 marks out of 60 marks in the Practical Exam conducted by the University. There is no passing minimum for the record notebook. However, submission of the record notebook is necessary. Candidate who does not obtain the required minimum marks for a pass in a Course/Practical shall be declared Re-Appear (RA) and the candidate has to appear and pass the same at a subsequent appearance.

Theory Course (Revised Bloom's Taxonomy)

Question Paper Model for UG

Intended Learning Skills	Maximum 70 marks Passing Minimum :40% Duration: Three hours
Memory Recall/ Example/ Counter Example/Knowledge about the Concept/ Understanding	Part- A ($20 \times 1 = 20$ marks) Answer ALL questions Each question carries 1 mark
	Four questions from each UNIT
	Questions 1 to Questions 20
Description/Application (problem)	Part- B ($5 \times 4 = 20$ marks) Answer ALL questions Each question carries 4 marks
	Either-or-Type Both parts of each question from the same Unit
	Questions 21(a) or 21 (b) to Questions 25(a) to 25(b)
Analysis/ Create/Evaluation	Part- C ($3 \times 10 = 30$ marks) Answer ANY THREE questions Each question carries 10 marks
	There shall be FIVE questions covering all the five units
	Question 26 to Question 30

Each question should carry course outcomes and cognitive level

For instance:

1. [CO1 : BL₂] Question xxxx
2. [CO3 : BL₁] Question xxxx

SEMETER WISE INDEX

Semester	Course	Course Code	Page No.
I	Python Programming	26UCSCC1	1
I	Python Programming – Practical	26UCSCCQ1	3
I	Numerical Methods	26UCSMGEC1	6
I	NME: Office Automation – Practical	26UCSSECQ1	8
I	Problem Solving Techniques	26UCSSEFC	10

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
26UCSCC1	Python Programming with Ethical AI Practices	Core	5	-	-	-	5	5	30	70	100
Learning Objectives											
LO1	To make students understand the concepts of Python programming.										
LO2	To apply the OOPs concept in PYTHON programming.										
LO3	To analyze Python solutions using functions, modules, data structures, and file handling techniques.										
LO4	To make the students learn best practices in PYTHON programming.										
LO5	To design and develop Python applications for real-world problem solving using ethical programming practices.										
UNIT	Contents									No. of Hours	
I	Basics of Python Programming: History of Python-Features of Python-Literal-Constants Variables - Identifiers–Keywords-Built-in Data Types-Output Statements - Input Statements-Comments – Indentation- Operators-Expressions-Type conversions. Python Arrays: Defining and Processing Arrays – Array methods.									15	
II	Control Statements: Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements.									15	
III	Functions: Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments-Recursion. Python Strings: String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules.									15	
IV	Lists: Creating a list -Access values in List-Updating values in Lists- Nested lists -Basic list operations-List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples– Difference between lists and tuples. Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.									15	
V	Python File Handling: Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword –Splitting words – File methods - File Positions- Renaming and deleting files. AI-Powered Coding Assistants: ChatGPT, Google Gemini, Claude, and their Ethical Use in Python Programming.									15	
TOTAL HOURS									75		

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Learn the basics of python, Do simple programs on python, Learn how to use an array.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Work with List, tuples and dictionary, Write program using list, tuples and dictionary.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Design and develop Python applications using AI-assisted coding tools to solve real-world problems ethically.	PO1, PO2, PO3, PO4, PO5, PO6
Textbooks		
1	Reema Thareja, “Python Programming using problem solving approach”, First Edition, 2017, Oxford University Press.	
2	Dr. R. NageswaraRao, “Core Python Programming”, First Edition, 2017, Dream tech Publishers.	
Reference Books		
1.	VamsiKurama, “Python Programming: A Modern Approach”, Pearson Education, First Edition 2017	
2.	Mark Lutz, “Learning Python”, Orielly, fifth Edition, February 2013	
3.	Adam Stewarts, “Python Programming”, Online.	
4.	Fabio Nelli, “Python Data Analytics”, APress, Third Edition, 2023.	
5.	Kenneth A. Lambert, “Fundamentals of Python First Programs”, Cengage Learning, Third Edition, 2023.	
Web Resources		
1.	https://www.programiz.com/python-programming	
2.	https://www.guru99.com/python-tutorials.html	
3.	https://www.w3schools.com/python/python_intro.asp	
4.	https://www.geeksforgeeks.org/python-programming-language/	
5.	https://en.wikipedia.org/wiki/Python_(programming_language)	

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	2	3
CO3	3	3	3	3	2	2
CO4	3	3	3	3	2	3
CO5	3	2	3	3	3	3
Weightage of course contributed to each PSO	15	14	15	15	12	14

Strong - 3

Medium - 2

Low - 1

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst Hours	Marks		
									CIA	External	Total
26UCSCCQ1	Python Programming- Practical	Core	-	-	4	-	3	4	40	60	100
Learning Objectives											
LO1	Be able to design and program Python applications.										
LO2	Be able to create loops and decision statements in Python.										
LO3	Be able to work with functions and pass arguments in Python.										
LO4	Be able to build and package Python modules for reusability.										
LO5	Be able to read and write files in Python.										
LAB EXERCISES									Required Hours		
1. Program using variables, constants, I/O statements in Python. 2. Program using Operators in Python. 3. Program using Conditional Statements. 4. Program using Loops. 5. Program using Jump Statements. 6. Program using Functions. 7. Program using Recursion. 8. Program using Arrays. 9. Program using Strings. 10 .Program using Modules. 11. Program using Lists. 12. Program using Tuples. 13. Program using Dictionaries. 14. Program for File Handling.									60		
Course Outcomes											
On completion of this course, students will											
CO1	Demonstrate the understanding of syntax and semantics of PYTHON Language										
CO2	Identify the problem and solve using PYTHON programming techniques.										
CO3	Identify suitable programming constructs for problem solving.										
CO4	Analyze various concepts of PYTHON language to solve the problem in anefficient way.										
CO5	Develop a PYTHON program for a given problem and test for its correctness.										

Mapping with Programme Specific Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	1	3	2	3
CO3	3	3	3	3	2	2
CO4	3	3	3	3	2	3
CO5	3	2	3	3	3	3
Weightage of course contributed to each PSO	15	14	13	15	12	14

Strong - 3

Medium - 2

Low - 1

Title of the Course		NUMERICAL METHODS					
Paper Number		EC I (GENERIC)					
Category	ELECTIVE COURSE	Year	I	Credits	5	Course Code	26UCSMGEC1
		Semester	I				
Instructional Hours per week		Lecture	Tutorial	Lab Practice		Total	
		5	-	-		5	
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		1. To introduce the various topics in Numerical methods. 2. To make understand the fundamentals of algebraic equations. 3. To apply interpolation and approximation on examples. 4. To solve problems using numerical differentiation and integration. 5. To solve linear systems, numerical solution of ordinary differential equations.					
Course Outcomes:							
Students will be able to							
CO1: Know how to solve various problems on numerical methods							
CO2: Use iterative methods, interpolations and approximation to solve problems							
CO3: Apply difference operators and Newton’s formula to estimate unknown values							
CO4: Apply numerical differentiation and integration techniques to approximate derivatives and definite integrals							
CO5: Find numerical solution of ordinary differential equations							
Course Outline	Unit–I(Hours: 15)						
	Fundamentals of Algebraic Equation						
	Solution of algebraic and transcendental equations-Bisection method – Fixed point iteration method – Newton Raphson method –linear system of equations – Gauss elimination method – Gauss Jordan method.						
	Chapter 3 (Sections 3.1, 3.2 & 3.4) & Chapter 4 (Sections 4.2 & 4.2.1)						
	Unit –II(Hours: 15)						
	Iterative, Interpolation and Approximation						
	Iterative methods - Gauss Jacobi and Gauss Seidel – Eigen values of a matrix by Power method and Jacobi’s method for symmetric matrices. Interpolation with unequal intervals – Lagrange’s interpolation – Newtons divided difference interpolation.						
	Chapter 4 (Sections 4.7 - 4.9), Chapter 13 (Section 13.1,13.2) & Chapter 8 (Sections 8.1-8.4, 8.5, 8.7)						
	Unit–III(Hours: 15)						
	Interpolation with Equal Interval						
	Difference operators and relations. -Interpolation with equal intervals – Newton’s forward and backward difference formulae.						
	Chapter 5 (Section 5.1, 5.2) & Chapter 6 (Sections 6.1 - 6.3)						
	Unit–IV(Hours: 15)						
	Numerical Differentiation and Integration						
	Approximation of derivatives using interpolation polynomials – Numerical integration using Trapezoidal, Simpson’s 1/3 rule.						
	Chapter 9 (Sections 9.1- 9.4, 9.9 - 9.11 & 9.13)						

	Unit –V (Hours:15) Initial Value Problems for Ordinary Differential Equations Single step methods – Taylor’s series method – Euler’s method – Modified Euler’s method – Runge Kutta method for solving(first, second, Third and 4th) order equations – Multi step methods. Chapter 11 (Sections 11.5, 11.9, 11.11 - 11.13 & 11.16 - 11.18)
Skills acquired from the course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Text	P. Kandasamy, K. Thilagavathy, K. Gunavathy- Numerical Methods, First edition, S.Chand & CompanyLtd.
Reference Books	H.C.Saxena-FiniteDifferencesandNumericalAnalysis,S.ChandPublishers,2005.
Web resources	https://nptel.ac.in/

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
26UCSSECQ1	Office Automation	Skill Enhancement Course :NME	2	-	-	-	2	2	40	60	100
Learning Objectives											
LO1	Understand the basics of computer systems and its components.										
LO2	Understand and apply the basic concepts of a word processing package.										
LO3	Understand and apply the basic concepts of electronic spreadsheet software.										
LO4	Understand and apply the basic concepts of database management system.										
LO5	Understand and create a presentation using PowerPoint tool.										
UNIT	Contents									No. of Hours	
I	Word Processing: Open, Save and close word document; Editing text - tools, formatting, bullets ; Spell Checker - Document formatting - Paragraph alignment, indentation, headers and footers, numbering; printing - Preview, options, merge.									6	
II	Spreadsheets: Excel opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying; Charts - creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.									6	
III	Database Concepts: The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding Programming environment in DBMS; Developing menu drive applications in query language(MS-Access).									6	
IV	Power point: Introduction to Powerpoint - Features – Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition – Animation effects, audio inclusion, timers.									6	
V	Set-Up MS Teams Chat on MS Teams - Different features of MS Teams - Calendar - Schedule a call on MS Teams - Scheduling Assistant - Out of Office- Teams - How to setup Teams - Make multiple channels on Teams- Approvals - Using approvals on MS Teams- Uploading files and folders - Sharing Access on One Drive - Different Sharing Access - Password protect for sharing purpose - Creating Shared Library - Creating Shared Library - Recycle Bin - Recycle Bin - Introduction to SharePoint - Introduction to SharePoint - Create Site - Create Site - Different features of SharePoint - Different features of SharePoint									6	
	Total									30	

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Possess the knowledge on the basics of computers and its components	PO1, PO2, PO3, PO6, PO8
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.	PO1, PO2, PO3, PO6
CO3	Learn the concepts of Database and implement the Query in Database.	PO3, PO5, PO7
CO4	Demonstrate the understanding of different automation tools.	PO3, PO4, PO5
CO5	Utilize the automation tools for documentation, calculation and presentation purpose.	PO4, PO6,
Text Book		
1.	Peter Norton, “Introduction to Computers” – Tata McGraw-Hill.	
Reference Books		
1.	Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, “Microsoft 2003”, Tata McGraw Hill.	
Web Resources		
1.	https://www.udemy.com/course/office-automation-certificate-course/	
2.	https://www.javatpoint.com/automation-tools	

Mapping with Programme Specific Outcomes:

MAPPING TABLE						
CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	1	2	2	2
CO2	2	3	1	3	2	2
CO3	1	3	1	1	3	1
CO4	1	2	1	1	3	1
CO5	1	2	1	1	3	3
Weightage of course contributed to each PSO	8	12	5	8	13	9

Strong - 3

Medium - 2

Low – 1

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
26UCSSEFC	Problem Solving Techniques	Skill Enhancement (Foundation Course)	2	-	-	-	2	2	30	70	100
Learning Objectives											
LO1	Familiarize with writing of algorithms, fundamentals of C and philosophy of problem solving.										
LO2	Implement different programming constructs and decomposition of problems into functions.										
LO3	Use data flow diagram, Pseudo code to implement solutions.										
LO4	Define and use of arrays with simple applications										
LO5	Understand about operating system and their uses										
UNIT	Contents									No. of Hours	
I	Introduction: History, characteristics and limitations of Computer. Hardware/Anatomy of Computer: CPU, Memory, Secondary storage devices, Input Devices and Output devices. Types of Computers: PC, Workstation, Minicomputer, Main frame and Supercomputer. Software: System software and Application software. Programming Languages: Machine language,Assembly language, High-level language,4 GL and 5GL-Features of good programming language. Translators: Interpreters and Compilers.									6	
II	Data: Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC). Structured Programming: Algorithm: Features of good algorithm, Benefits and drawbacks of algorithm. Flowcharts: Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. Pseudocode: Writing a pseudocode. Coding, documenting and testing a program: Comment lines and types of errors. Program design: Modular Programming.									6	
III	Selection Structures: Relational and Logical Operators -Selecting from Several Alternatives – Applications of Selection Structures. Repetition Structures: Counter Controlled Loops –Nested Loops– Applications of Repetition Structures.									6	
IV	Data: Numeric Data and Character Based Data. Arrays: One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.									6	
V	Data Flow Diagrams: Definition, DFD symbols and types of DFDs. Program Modules: Subprograms-Value and Reference parameters- Scope of a variable - Functions – Recursion. Files: File Basics-Creating and reading a sequential file-Modifying Sequential Files.									6	
TOTAL HOURS									30		

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Understand the fundamentals of computers, programming languages, and software concepts used in problem solving.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Apply algorithms, flowcharts, pseudocode, and modular programming techniques to solve computational problems.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Analyze programming problems using selection and looping structures	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Evaluate the use of arrays and character data structures in solving computational problems.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Design structured programs using functions, recursion, and file handling.	PO1, PO2, PO3, PO4, PO5, PO6
Textbooks		
1	Stewart Venit, “Introduction to Programming: Concepts and Design”, Fourth Edition, 2010, Dream Tech Publishers.	
Web Resources		
1.	https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm	
2.	http://www.nptel.iitm.ac.in/video.php?subjectId=106102067	
3.	http://utubersity.com/?page_id=876	

Mapping with Programme Specific Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	1	1	1
CO2	3	3	2	2	2	2
CO3	3	3	3	2	2	2
CO4	2	3	3	3	2	2
CO5	3	3	3	3	3	3
Weightage of course contributed to each PSO	14	14	13	11	10	10

Strong - 3

Medium - 2

Low -1