SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'A' grade by NAAC)

B.Sc. COMPUTER SCIENCE (CLOUD COMPUTING AND CYBER SECURITY) – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025 – 2026 onwards)

ABOUT THE DEPARTMENT

The Department of Computer Science was established during the year 1987–88 with B.Sc. Computer Science Programme. Since then, the Department has been functioning successfully producing young Computer Science graduates every year, with well trained and experienced faculty members and supporting staff. So far, the Department has produced more than 1000 (33 batches) Computer Science graduates and they are all well placed in India &Abroad. The Department has been producing excellent results over a period of 35 years. The Department has adequate infrastructure with a well–equipped Computer Laboratory with LCD Projector, a well stacked Department Library, well–furnishedclassrooms.From2023onwards we have got approval for Cloud Computing and Cyber Security Programme.

VISION

- Apply a broad understanding of the fundamental theories, concepts, and applications of Computer Science in their career.
- Analyze a multifaceted computing problem and to apply principles of computing and other relevant disciplines to identify solutions and compare alternative solutions to computing problems.
- Apply Computer Science theory and software development fundamentals to produce computing–based solutions.
- To attain an ability to use current techniques, skills, and tools necessary for computing practice.
- To affiance in a wide range of careers and/or graduate studies in computer science or related fields with a zeal for lifelong learning.
- To communicate effectively, both orally and in writing and engaged in collaborative teamwork.
- Recognize the social and ethical err and so far professional working in the discipline**.**

MISSION

The Mission of the Department is to impart computer education to the students in the rural area of Madurai district, so that they become enlightened and intelligent, and to improve the standards of their life, as well as to produce graduates who excel in research and service. We also aim to inculcate the attitudes and values that will motivate them towards the continuous process of learning and leadership. We strive to educate ground– breaking skills and technology for the benefit of learners through incessant up gradation of curriculum.

GRADUATE ATTRIBUTES

The Graduate Attributes:

1. **(KB) A knowledge base for Computer Science**: Demonstrated competence in university level mathematics, natural sciences, Computer Science fundamentals, and specialized Computer Science knowledge appropriate to the program.
2. **(PA)Problem analysis**: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex Computer Science problems in order to reach substantiated conclusions
3. **(Inv.) Investigation**: An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data and synthesis of information in order to reach valid conclusions.
4. **(Des.) Design:** An ability to design solutions for complex, open–ended Computer Science problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
5. **(Tools) Use of Computer Science tools**: An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern Computer Science tools to a range of Computer Science activities, from simple to complex, with an understanding of the associated limitations.
6. **(Team) Individual and teamwork**: An ability to work effectively as a member and leader in teams, preferably in a multi–disciplinary setting.
7. **(Comm.) Communication skills**: An ability to communicate complex Computer Science concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.
8. **(Prof.) Professionalism**: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.
9. **(Impacts) Impact of Computer Science on society and the environment**: An ability to analyze social and environmental aspects of Computer Science activities. Such ability includes an understanding of the interactions that Computer Science has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.
10. **(Ethics) Ethics and equity**: An ability to apply professional ethics, accountability, and equity.
11. **(Econ.)Economics and project management** :An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of Computer Science and to understand their limitations.
12. **(LL) Life–long learning**: An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1	To make the students successful in their professional careers, including entrepreneurship using their knowledge in computer science and applications.
PEO2	To help the students continue to learn and adopt latest technologies to solve real life problems.
PEO3	To motivate the students pursue research and higher education.
PEO4	To inculcate in student's professional and ethical attitude, communication skills, Team work skills, Multi–Disciplinary approach and an ability to relate computer science issues with social awareness.
PEO5	To prepare students to excel in post graduate programmes in computer science to succeed in computing industry profession through quality education.

UNDERGRADUATE (UG) PROGRAMME OUTCOMES

Undergraduate (B.A., **B.Sc.,** B.Com., B.C.A., B.B.A., etc.,) is a 3 – year degree Programme with 6 semesters consisting the following Programme Outcomes (POs) under various criteria including critical thinking, problem solving, effective communication, societal/ citizenship/ ethical credibility, sustainable growth and employable abilities.

PO1	**Critical Thinking**: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO2	**Problem Solving**: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO3	**Effective Communication**: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO4	**Societal/ Citizenship/ Ethical Credibility**: Realization of various value systems/ moral dimensions and demonstrate the empathetic social concern as well as equity in all the decisions, executions and actions.
PO5	**Environmental Concern and Sustainable Growth**: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO6	**Skill Development and Employable Abilities**: Adequate training in relevant skill sector and creating employable abilities among the under graduates.

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PROGRAMME SPECIFIC OUTCOMES (PSOs)

Upon completion of **B.Sc. Computer Science (Cloud Computing and Cyber Security) Programme**, the students will be able to

PSO1	Think in a critical and logical based manner. Equip with computer science technical ability, problem solving skills, creative talent and power of communication necessary for various forms of employment.
PSO2	Become familiar 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 issue or problem at hand.
PSO4	Understand , formulate, develop programming model with logical approaches to and 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, get adequate exposure to global and local concerns that provides platform for further exploration into multi–dimensional aspects of computing sciences.
PSO6	Receive 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, develop a range of generic skills helpful in employment, internship and social activities.

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641

DISTRIBUTION OF CREDITS (UG PROGRAMME)

Part	Semester	Courses	No. of Courses	Hrs.	Credits	Total Credits
I	I–IV	Language	4	6	3	12
II	I–IV	English	4	6	3	12
III	I–VI	Core	15	5–6	4–5	69
	I–VI	Elective and Elective/Allied	8	4–5	3–4	24
IV	I–II	SEC (Non Major Elective)	2	2	2	4
	I	Foundation Course FC	1	2	2	2
	I–IV	SEC (Discipline Specific/ Generic)	5	2	2	10
	IV	EVS (Environmental Studies)	1	2	2	2
	V	Value Education	1	2	2	2
	V	Internship	1	–	1	1
V	IV	Extension Activity	1	–	1	1
	V	Soft Skills (Self – Study)	1	–	1	1
	VI	General Knowledge (online) (Self – Study)	1	–	1	1
Additional credit will be given to any Online Course taken in SWAYAM Portal						
		Total				**141**

Passed in the BoS Meeting held on 27/02/2025 **Signature of the Chairman**

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642

B.Sc. COMPUTER SCIENCE (CLOUD COMPUTING AND CYBER SECURITY)

COURSE STRUCTURE – SEMESTER – I

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT11	I	**Tamil** – பொதுத் தமிழ் – I	6	3	25	75	100	3
	25UACH11		**Hindi**–General Hindi–I						
	25UACS11		**Sanskrit** – Poetry, Grammar and History of Sanskrit Literature						
2	25UACE11	II	**English** – General English – I	6	3	25	75	100	3
3	25UCDC11	III	**Core – 1:** Problem Solving through C & C++	5	3	25	75	100	5
4	25UCDCP1		**Core – 2: Lab:** Programming in C	5	3	40	60	100	5
5	25UCDA11		**Elective/Allied – 1:** Discrete Mathematical Structures	4	3	25	75	100	3
6	25UCDN11	IV	**SEC – 1: NME:** Office Automation	2	3	25	75	100	2
7	25UCDFC1		**Foundation Course:** Problem Solving Techniques	2	3	25	75	100	2
			TOTAL	**30**				**700**	**23**

II – SEMESTER

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT21	I	**Tamil** – பொதுத் தமிழ்– II	6	3	25	75	100	3
	25UACH21		**Hindi** – General Hindi – II						
	25UACS21		**Sanskrit** – Prose, Grammar and History of Sanskrit Literature						
2	25UACE21	II	**English** – General English – II	6	3	25	75	100	3
3	25UCDC21	III	**Core – 3:** Java Programming	5	3	25	75	100	5
4	25UCDCP2		**Core – 4: Lab:** Java Programming	5	3	40	60	100	5
5	25UCDA21		**Elective/Allied– 2:** Numerical Methods	4	3	25	75	100	3
6	25UCDN21	IV	**SEC – 2: NME:** Quantitative Aptitude	2	3	25	75	100	2
7	25UCDSP1		**SEC – 3:DS** : **Lab:** Advanced Excel	2	3	40	60	100	2
			TOTAL	**30**				**700**	**23**

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643

COURSE STRUCTURE – SEMESTER – I

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT11	I	**Tamil** – பொதுத் தமிழ் – I	6	3	25	75	100	3
	25UACH11		**Hindi**– General Hindi–I						
	25UACS11		**Sanskrit** – Poetry, Grammar and History of Sanskrit Literature						
2	25UACE11	II	**English –** General English – I	6	3	25	75	100	3
3	25UCDC11	III	**Core – 1:** Problem Solving through C & C++	5	3	25	75	100	5
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5	25UCDA11		**Elective/Allied – 1:** Discrete Mathematical Structures	4	3	25	75	100	3
6	25UCDN11	IV	**SEC – 1: NME:** Office Automation	2	3	25	75	100	2
7	25UCDFC1		**Foundation Course:** Problem Solving Techniques	2	3	25	75	100	2
			TOTAL	**30**				**700**	**23**

CA – Class Assessment (Internal)

SE – Summative Examination

SEC – Skill Enhancement Course

DS – Discipline Specific

NME – Non –Major Elective

T – Theory

P – Practical

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644

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDC11	PROBLEM SOLVING THROUGH C AND C++	CORE – 1	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship				✓
	National	✓	Local	✓	Regional	✓	Global				✓
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

This course helps to provide the fundamental knowledge of a programming language and its features which enhances the user to write general purpose application programs.

COURSE OBJECTIVES:

- To gain knowledge in C language.
- To inculcate fundamental programming skills.

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the program structure of c with its syntax and semantics	Upto K3
CO 2	understand the programming principles in C (data types, operators, branching and looping, arrays functions, structures, pointers and files)	Upto K3
CO 3	apply the programming principles learnt in real–time problems	Upto K3
CO 4	analyze the various methods of solving a problem and choose the best method	Upto K3
CO 5	code, debug and test the programs with appropriate test cases	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

PROBLEM SOLVING THROUGH C AND C++

UNIT– I:

Introduction: Computer of Languages– Flow charts–algorithms–History of C language Basic Structure–Programming Rules –Commonly used library functions Executing the C Program Pre–processors in "C"– Keywords & Identifiers – Constants –Variables: Rules for defining variables – Scope and Life of a Variable—Data types – Type Conversion Formatted Input and Output operations. Operators: Introduction Arithmetic – Relational – Logical – Assignment – Conditional – Special – Bitwise –Increment/Decrement operator

UNIT– II:

Conditional statements: Introduction – If statements – If–else statements – nested if–else – break statement–continue and exit–statement – goto–statement–Switch statements. Looping statements: Introduction–While statements Statements–nested loop statements. Do–while statements– For statements. Arrays: Introduction – Types of arrays, one dimensional arrays – Declaration of one dimensional arrays–Accessing array elements–Storing values in an array –Two Dimensional Arrays Declaration of two dimensional arrays – Accessing array elements– Storing values in 2–D arrays.

UNIT– III:

Strings and Functions : Strings: Definition, Declaration and Initialization of String Variables – String Handling Functions. Functions: Definition and declaration of functions– Function proto type–return statement– types of functions and Built–in functions. User–defined functions: Introduction–Need for user defined Function and Components

UNIT– IV

Principles of Object Oriented Programming: Basic concepts – Benefits of OOP – Applications of OOP – A simple C++ program – Structure of C++ program – Creating, compiling and linking. **Tokens, Expressions and Control structures –** Token – keyword – identifier and Constant – data type – type compatibility – operators – manipulators**. Classes and Objects** – specifying class – defining member functions – making an outside function inline – nesting of member function – **Constructors and Destructors** – Introduction – constructors – types of constructor – destructor.

UNIT– V:

Inheritance – introduction – single inheritance – multilevel inheritance – multiple inheritance – hierarchical inheritance – hybrid inheritance – **Virtual Function** – this pointer – virtual function – **Files** – Introduction – classes for file stream operations – opening and closing a file – file pointers and their manipulations – error handling during file operations – command line argument.

TEXT BOOK:

E. Balagurusamy, ***Programming in ANSI C***, Fifth Edition, Tata McGraw–Hill, 2010.

REFERENCE BOOKS:

1. Byron Gottfried, Schaums, ***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

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2
CO2	3	3	2	3	2	2
CO3	3	3	3	3	2	2
CO4	3	3	2	3	2	2
CO5	3	3	2	3	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

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646

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDCP1	LAB: PROGRAMMING IN C	CORE – 2 LAB	–	5	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	40	60	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship				✓
	National	✓	Local	✓	Regional	✓	Global				✓
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

This course helps to provide the fundamental knowledge of a programming language and its features which enhances the user to write general purpose application programs.

COURSE OBJECTIVES:

- To implement programming skills using C
- To impart knowledge and provide efficient solutions for real time problems using C language

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Remember and understand how to write programs using the basic syntax and semantics in C	Upto K3
CO 2	Apply the concepts of functions, macros, arrays, structures, pointers and files in programs to solve problems	Upto K3
CO 3	Analyze and understand programs written in C language	Upto K3
CO 4	Evaluate the program execution flow with test cases and apply debugging	Upto K3
CO 5	Design algorithms and write programs in C language for the given problems	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

Passed in the BoS Meeting held on 27/02/2025 **Signature of the Chairman**

LAB: PROGRAMMING IN C

UNIT– I:

Variables, Data types, Constants and Operators:

1. Evaluation of expression ex: ((x+y) ^2 * (x+z))/w
2. Temperature conversion problem (Fahrenheit to Celsius)
3. Program to convert days to months and days (Ex: 364 days = 12 months and 4 days)
4. Solution of quadratic equation
5. Salesman salary (Given: Basic Salary, Bonus for every item sold, commission on the total monthly sales)

UNIT– II:

Decision making Statements:

6. Maximum of three numbers
7. Calculate Square root of five numbers (using goto statement)
8. Pay–Bill Calculation for different levels of employee (Switch statement)
9. Fibonacci series
10. Floyds Triangle
11. Pascal‟s Triangle.

UNIT– III:

Arrays, Functions and Strings

12. Prime numbers in an array
13. Sorting data (Ascending and Descending)
14. Matrix Addition and Subtraction
15. Matrix Multiplication
16. Function with no arguments and no return values
17. Function that convert lower case letters to upper case
18. Factorial using recursion.
19. Perform String Operations using Switch Case.

UNIT– IV:

Structures and Macros

20. Structure that describes a Hotel (name, address, grade, avg room rent, number of rooms) Perform some operations (list of hotels of a given grade etc.)
21. Using Pointers in Structures.
22. Cricket team details using Union.
23. Write a macro that calculates the max and min of two numbers
24. Nested macro to calculate Cube of a number.

UNIT– V:

Pointers and Files

25. Evaluation of Pointer expressions
26. Function to exchange two pointer values
27. Creation, insertion and deletion in a linked list
28. Program to read a file and print the data.
29. Program to receive a file name and a line of text as command line arguments and write the text to the file
30. Program to copy the content of one file to another file

TEXT BOOK:

E. Balagurusamy, ***Programming in ANSI C***, Fifth Edition, Tata McGraw–Hill, 2010**.**

REFERENCE BOOKS:

1. Byron Gottfried, Schaums, ***Outline Programming with C***, Fourth Edition, Tata McGraw–Hill, 2018.
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CO1	3	2	2	3	2	2
CO2	3	3	2	3	2	2
CO3	3	3	3	3	2	2
CO4	3	3	2	3	2	2
CO5	3	3	2	3	3	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

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649

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDA11	DISCRETE MATHEMATICAL STRUCTURES	ELECTIVE/ ALLIED – 1	4	–	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship				✓
	National	✓	Local	✓	Regional	✓	Global				✓
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

This course helps to provide the fundamental knowledge of Discrete structures like Set theory, Relations, Functions, Matrices, Logic, Graph Theory.

COURSE OBJECTIVES:

- To understand the mathematical concepts like set theory and relations
- To Impart knowledge on solving problems using logic
- To give the basic concepts of number theory and its applications

COURSEOUTCOMES(COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	To gain knowledge on set theory	Upto K3
CO 2	Able to understand different mathematical logics and functions	Upto K3
CO 3	To get an idea on Permutations and Combinations	Upto K3
CO 4	Understanding the different form of number theory	Upto K3
CO 5	Able to understand Relations and its application	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

DISCRETE MATHEMATICAL STRUCTURES

UNIT– I: SET THEORY

Introduction– set and Its Element – Set Description (Roster, Set Builder and cardinal number method) Types of Sets– Set Operations and Laws of set Theory. Partition of sets. Minsets–Countable and un Countable set. Algebra of sets and Duality.

UNIT– II: MATHEMATICAL LOGIC

Basic Logic and Proof, logical operations – Logic Propositional equivalence, Predicates and Quantities, Tautology–Contradiction–Methods of proofs(Direct and Indirect)– Function– Definition–Notation– Types of Function– Composition of Functions.

UNIT– III: NUMBER THEORY

The Integers and Division, Integers and Algorithms, (Multiplication, Addition and Division –Sequences and Summations, Recursive algorithms, Program correctness

UNIT– IV: COMBINATORICS

The basics of counting, the pigeonhole principle, Permutations and Combinations, Binomial coefficients, Generalized permutations and combinations

UNIT– V: RELATIONS

Relations – Relations and their properties, Representing Relations, Closures of relations, Equivalence relations, Partial orderings–Recurrence Relations Binary Relations.

TEXT BOOKS:

1. Rosen K.H.***DiscreteMathematicsanditsApplications***,5th edition,TataMcGraw–Hills, 2003.
2. J.KSharma,***DiscreteMathematics***,3rd Edition,MacmillanReprint2011.

REFERENCE BOOKS:

1. Johnson Baugh R, and Carman R, ***Discrete Mathematics***, 5th edition, Person Education, 2003.
2. Kolman B, Busoy R.C, and Ross S.C, ***Discrete Mathematical Structures,*** 5th edition, Pretitice – Hall,2004.
3. Mott J.L, Kandel A, and Bake T.P, ***Discrete Mathematics for Computer Scientists & Mathematicians,*** 2nd edition, Prentice–Hall of India,2002.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	2	1	1	3
CO2	2	2	1	1	1	1
CO3	1	1	2	3	1	1
CO4	1	3	1	1	1	3
CO5	1	1	2	2	2	2

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651

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDN11	OFFICE AUTOMATION	SEC – 1 NME	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship		✓			
	National	✓	Local	✓	Regional	✓	Global				✓	
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values			

COURSE DESCRIPTION:

The main objectives of this course to train students in automating the office work using MS–WORD, MS–EXCEL, MS–POWERPOINT and MS–ACCESS.

COURSE OBJECTIVES:

- To Create an Awareness about fundamentals of Computers to Non Computer Science students
- To Give Knowledge about document handling using MS–WORD, Creating Worksheets and Graphs using MS–EXCEL , slide presentation using MS–POWERPOINT& MS–ACCESS

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	Gain an awareness about fundamentals of computers	Upto K3
CO 2	Understand and apply the basic concepts of a word processing package.	Upto K3
CO 3	Understand and apply the basic concepts of electronic spreadsheet software	Upto K3
CO 4	Understand and apply the basic concepts of database management system.	Upto K3
CO 5	Understand and create a presentation using Power Point tool	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

OFFICE AUTOMATION

UNIT – I:

Introductory concepts: Memory unit–CPU–Input Devices:Key board, Mouse and scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS–UNIX–Windows. Introduction to Programming Languages.

UNIT – II:

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.

UNIT – III:

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.

UNIT – IV:

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).

UNIT – V:

Power point: Introduction to Power point – Features – Understanding slide typecasting & viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition– Animation effects, audioinclusion, timers.

TEXT BOOK:

Peter Norton***, Introduction to Computers*** **–**Tata McGraw–Hill**.**

REFERENCE BOOK:

Jennifer Ackerman Kettle, Guy Hat–Davis, Curt immons, ***Microsoft2003,*** TataMcGraw–Hill.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	2	2	3	3	2
CO3	2	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	3	3	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'A' grade by NAAC)

B.Sc. COMPUTER SCIENCE (CLOUD COMPUTING AND CYBER SECURITY) – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025 – 2026 onwards)

653

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDFC1	PROBLEM SOLVING TECHNIQUES	FOUNTATION COURSE	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓					
	National	✓	Local	✓	Regional	✓	Global	✓			
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

This course will teach you the skills necessary to solve problems effectively using the programming language. You will learn how to break down problems into smaller, more manageable steps, how to identify and apply the appropriate mathematical and algorithmic techniques, and how to test and debug your solutions in programming language.

COURSE OBJECTIVES:

- Tounderstandtheimportanceofalgorithmsandprograms,andtoknowofthebasic problem solving strategies.
- To learn efficient strategies and algorithms to solve standard problems, thus laying a firm foundation for designing algorithmic solutions to problems.

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Understand the systematic approach to problem solving.	Upto K3
CO 2	Know the approach and algorithms to solve specific fundamental problems.	Upto K3
CO 3	Understandtheefficientapproachtosolvespecificfactoring–relatedproblems.	Upto K3
CO 4	Understand the efficient array–related techniques to solve specific problems.	Upto K3
CO 5	Understand the efficient methods to solve specific problems related to text processing. Understand how recursion works.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

Passed in the BoS Meeting held on 27/02/2025 **Signature of the Chairman**

PROBLEM SOLVING TECHNIQUES

UNIT – I:

Introduction: Notion of algorithms and programs – Requirements for solving problems by computer – The problem–solving aspect: Problem definition phase, Getting started on a problem, The use of specific examples, Similarities among problems, Working backwards from the solution – General problem–solving strategies – Problem solving using top–down design – Implementation of algorithms – The concept of Recursion.

UNIT – II:

Fundamental Algorithms: Exchanging the values of two variables – Counting – Summation of a set of numbers – Factorial computation – Sine function computation – Fibonacci Series generation – Reversing the digits of an integer – Base Conversion.

UNIT – III:

Factoring Methods: Finding the square root of a number – The smallest divisor of an integer – Greatest common divisor of two integers – Generating prime numbers – Computing the prime factors of an integer – Generation of pseudo–random numbers – Raising a number to a large power – Computing the nth Fibonacci number.

UNIT – IV:

Array Techniques: Array order reversal –Array counting or his to gramming–Finding the maximum number in a set– Removal of duplicates from an ordered array – Partitioning an array – Finding the k^{th} smallest element – Longest monotone subsequence.

UNIT – V:

Text Processing and Pattern Searching: Text line length adjustment –left and right justification of text –Keyword searching in text – Text line editing – Linear pattern search. Recursive algorithms: Towers of Hanoi – Permutation generation.

TEXT BOOK:

R.G. Dromey**,** ***How to Solve it by Computer,*** Pearson India, 2007**.**

REFERENCE BOOKS :

1. George Polya, Jeremy Kilpatrick**,** ***The Stanford Mathematics Problem Book: With Hints and Solutions***, Dover Publications, 2009 (Kindle Edition 2013).
2. Greg WScragg, ***Problem Solving with Computers***, Jones &Bartlett1st edition, 1996.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	2	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	3	3	3	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

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B.Sc. COMPUTER SCIENCE (CLOUD COMPUTING AND CYBER SECURITY) – SYLLABUS

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(For the students admitted from the academic year 2025 – 2026 onwards)

655

COURSE STRUCTURE – SEMESTER – II

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT21	I	**Tamil** – பொதுத் தமிழ்– II	6	3	25	75	100	3
	25UACH21		**Hindi** – General Hindi – II						
	25UACS21		**Sanskrit** – Prose, Grammar and History of Sanskrit Literature						
2	25UACE21	II	**English** – General English – II	6	3	25	75	100	3
3	25UCDC21	III	**Core – 3:** Java Programming	5	3	25	75	100	5
4	25UCDCP2		**Core – 4: Lab:** Java Programming	5	3	40	60	100	5
5	25UCDA21		**Elective/Allied– 2:** Numerical Methods	4	3	25	75	100	3
6	25UCDN21	IV	**SEC – 2: NME:** Quantitative Aptitude	2	3	25	75	100	2
7	25UCDSP1		**SEC – 3: DS** : **Lab:** Advanced Excel	2	3	40	60	100	2
			TOTAL	**30**				**700**	**23**

CA – Class Assessment (Internal)

SE – Summative Examination

SEC – Skill Enhancement Course

DS – Discipline Specific

NME – Non –Major Elective

T – Theory

P – Practical

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656

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDC21	JAVA PROGRAMMING	CORE – 3	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship				✓
	National	✓	Local	✓	Regional	✓	Global				✓
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

This course teaches students the syntax of the java programming language; Object oriented programming with the java programming language; creating graphical user interfaces (GUI), exceptions and file input/output(I/O).

COURSE OBJECTIVES:

- To provide fundamental knowledge of object–oriented programming.
- To equip the student with programming knowledge in Core Java from the basics.
- To enable the students to use AWT controls, Event Handling and Swing for GUI

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Understand the basic Object–oriented concepts. Implement the basic constructs of Core Java	Upto K3
CO 2	Implement inheritance, packages, interfaces and exception handling of Core Java	Upto K3
CO 3	Implement multi–threading and IO Streams of CoreJava	Upto K3
CO 4	Implement AWT and Event handling.	Upto K3
CO 5	Use Swing to create GUI.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

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JAVA PROGRAMMING

UNIT– I: INTRODUCTION

Review of Object Oriented concepts–History of Java–Java buzzwords– JVM architecture–Data Types–Variables–Scope and lifetime of variables–arrays–operators – control statements–type conversion and casting–simple java program constructors–methods – Static block – Static Data –Static Method String and String Buffer Classes.

UNIT– II: INHERITANCE

Basic concepts – Types of inheritance – Member access rules – Usage of this and Super keyword – Method Overloading – Method overriding – Abstract classes – Dynamic method dispatch – Usage of final keyword.

Packages: Definition–Access Protection–Importing Packages. **Interfaces:** Definition–Implementation–Extending Interfaces.

Exception Handling: try – catch – throw – throws –finally– Built–inexceptions – Creating Own Exception classes.

UNIT– III: MULTITHREADED PROGRAMMING

Thread Class–Runnable interface–Synchronization–using synchronized methods–Using *synchronized* Statement–Inter Thread Communication–Deadlock.

I/O Streams: Concepts of streams – Stream classes– Byte and Character stream – Reading console Input and Writing Console output – File Handling.

UNIT– IV: AWT CONTROLS

The AWT class hierarchy–user interface components– Labels – Button – Text Components – Check Box – Check Box Group – Choice – List Box – Panels – Scroll Pane – Menu – Scroll Bar. Working with Frame class – Colour – Fonts and layout managers.

Event Handling: Events–Event sources – Event Listeners– Event Delegation Model (EDM) – Handling Mouse and Keyboard Events – Adapter classes – Inner classes.

UNIT– V: Swing

Introduction to Swing – Hierarchy of swing components. Containers–Top level containers–JFrame– JWindow – JDialog – JPanel – JButton – Jtoggle Button – Jcheck Box – Jradio Button – JLabel, JText Field –Jtext Area–JList –Jcombo Box–JScroll Pane.

TEXT BOOKS:

1. Herbert Schildt, ***The Complete Reference,*** Tata McGraw Hill, NewDelhi,7th Edition, 2010.
2. Gary Cornell, ***Core Java 2*** Volume I–Fundamentals, Addison Wesley, 1999.

REFERENCE BOOKS:

1. **Head *First Java,*** O"RiellyPublications**,**
2. Y.Daniel Liang**, *Introduction to Java Programming,*** 7th Edition, Pearson Education India, 2010.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	1	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

Passed in the BoS Meeting held on 27/02/2025 **Signature of the Chairman**

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B.Sc. COMPUTER SCIENCE (CLOUD COMPUTING AND CYBER SECURITY) – SYLLABUS

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(For the students admitted from the academic year 2025 – 2026 onwards)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDCP2	LAB: JAVA PROGRAMMING	CORE – 4 LAB	–	5	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	40	60	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship				✓	
	National	✓	Local	✓	Regional	✓	Global				✓	
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values			

COURSE DESCRIPTION:

This course provides the object oriented programming features which supports modular programming and Applet programming features which support web based programming.

COURSE OBJECTIVES:

- To gain practical expertise in coding Core Java programs
- To become proficient in the use of AWT, Event Handling and Swing.

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Write Programs using Object Oriented Programming Paradigm – Encapsulation(Classes and Objects), Polymorphism and Inheritance	Upto K3
CO 2	Apply various Java Features Like Multi–threading, Exceptional handling, Interface, Package, Over loading, Overriding	Upto K3
CO 3	Utilize different types of inheritance to suit different applications.	Upto K3
CO 4	Design to write programs using OOP Paradigm that enables run time polymorphism using interface and applet programming	Upto K3
CO 5	Apply OOP Paradigm for flat file organization.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

LAB: JAVA PROGRAMMING

LIST OF PROGRAMS

1. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer.
2. Write a Java program to multiply two given matrices.
3. Write a Java program that displays the number of characters, lines and words in a text.
4. Generate random numbers between two given limits using Random class and print messages according to the range of the value generated.
5. Write a program to do String Manipulation using Character Array and perform the following string operations:
   a. String length
   b. Finding a character at a particular position
   c. Concatenating two strings
6. Write a program to perform the following string operations using String class:
   a. String Concatenation
   b. Search a sub string
   c. To extract substring from given string
7. Write a program to perform string operations using StringBuffer class:
   a. Length of a string
   b. Reverse a string
   c. Delete a substring from the given string
8. Write a java program that implements a multi–thread Application that has three threads First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
9. Write a threading program which uses the same method asynchronously to print the numbers 1to10 usingThread1 and to print 90to100 using Thread2.
10. Write a program to demonstrate the use of following exceptions.
    a. Arithmetic Exception
    b. Number Format Exception
    c. Array Index Out of Bound Exception
    d. Negative Array Size Exception
11. Write a Java program that reads on filename from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes?
12. Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls.
13. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired. (Use adapter classes).
14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, –,*, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.
15. Write a Java program that simulates a traffic light. The Program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button,an appropriate message with "stop" or "ready" or "go" should appear above the buttons in a selected color. Initially there is no message shown.

TEXT BOOKS:

1. Herbert Schildt, ***The Complete Reference,*** Tata McGraw Hill, NewDelhi, 7th Edition, 2010.
2. Gary Cornell, ***CoreJava 2*** Volume I–Fundamentals, Addison Wesley, 1999.

REFERENCE BOOKS:

1. **Head *First Java,*** O'Rielly Publications**,**
2. Y. Daniel Liang***, Introduction to Java Programming,*** 7th Edition, Pearson Education India, 2010.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	2	2	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	1	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

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661

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDA21	NUMERICAL METHODS	ELECTIVE/ ALLIED – 2	4	–	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship				✓
	National	✓	Local	✓	Regional	✓	Global				✓
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

This course helps to provide the fundamental knowledge about Numerical methods.

COURSE OBJECTIVES:

- To introduce the various topics in Numerical methods.
- To make understand the fundamentals of algebraic equations.
- To apply interpolation and approximation on examples.
- To solve problems using numerical differentiation and integration.
- To solve linear systems, numerical solution of ordinary differential equations.

COURSE OUTCOMES (COs):

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

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Know how to solve various problems on numerical methods	Upto K3
CO 2	Use approximation to solve problems	Upto K3
CO 3	Differentiation and integration concepts are applied	Upto K3
CO 4	Apply, direct methods for solving linear systems	Upto K3
CO 5	Numerical solution of ordinary differential equations	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

NUMERICAL METHODS

UNIT – I: 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.

UNIT – II: 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 – Newton's divided difference interpolation

UNIT – III: INTERPOLATION WITH EQUAL INTERVAL

Difference operators and relations. –Interpolation with equal intervals – Newton's forward and backward difference formulae.

UNIT–IV: NUMERICAL DIFFERENTIATION AND INTEGRATION

Approximation of derivatives using interpolation polynomials – Numerical integration using Trapezoidal, Simpson's 1/3 rule

UNIT–V: INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS

Single step methods – Taylor's series method – Euler's method – Modified Euler's method – RungeKutta method for solving(first, second , Third and 4th) order equations – Multi step methods

TEXT BOOK:

S.Arumugam, A.ThangapandiIssac, A. Somasundaram, ***Numerical Methods***, Second Edition, , SCITECH publications, 2009.

REFERENCE BOOKS:

1. Mathews J.H. ***Numerical Method for Maths, Science and Engineering***; PHI, New Delhi, 2001.
2. Iqbal H. Khan & Q. Hassan ***Numerical Methods for Engineers and Scientist*** – Galgotia Publications (P) Ltd., New Delhi – 1997.
3. M.K. Jain, S.R.K. Iyengar & R.K.Jain – ***Numerical Methods for Scientific and Engineering Computation*** – New Age International(P) Ltd., New Delhi – 1996.

DIGITAL TOOLS:

Web resources from N D L Library , E–content from open source libraries

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	2	1	1	3
CO2	2	2	1	1	1	1
CO3	1	1	2	3	1	1
CO4	1	3	1	1	1	3
CO5	1	1	2	2	2	2

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663

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDN21	QUANTITATIVE APTITUDE	SEC – 2 NME	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability		✓	Skill Oriented		✓	Entrepreneurship			✓	
	National	✓	Local	✓	Regional	✓	Global			✓	
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

Quantitative aptitude is an inseparable and an integral part of aptitude exams in India. It tests the quantitative skills along with logical and analytical skills. One can test their own number of handling techniques and problem solving skills by solving these problems.

COURSE OBJECTIVES:

- To improve the quantitative skills of the students
- To prepare the students for various competitive exams

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	To gain knowledge on LCM and HC Fand its related problems	Upto K3
CO 2	To get an idea of age, profit and loss related problem solving.	Upto K3
CO 3	Able to understand time series simple and compound interests	Upto K3
CO 4	Understanding the problem related to probability, and series	Upto K3
CO 5	Able to understand graphs, charts	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

QUANTITATIVE APTITUDE

UNIT–I

Numbers–HCF and LCM of Numbers–Decimal fractions– Simplification–Square roots and cube roots–Average– Problems on Numbers.

UNIT II:

Problems on Ages – Surds and Indices – Percentage – Profits and loss–ratio and proportion – Partnership – Chain rule.

UNIT III:

Time and work – pipes and cisterns–Time and Distance – Problems on trains –Boats and streams – Simple interest – Compound interest – Logarithms – Area –Volume and surface area – races and Games of skill.

UNIT IV:

Permutation and combination – Probability – True Discount– Bankers Discount–Height and Distances–Oddman out & Series.

UNIT V:

Calendar – Clocks – stocks and shares– Data representation – Tabulation – Bar Graphs – Piecharts – Line graphs

TEXT BOOK:

Quantitative Aptitude, R.S.AGGARWAL., S.Chand & Company Ltd.,

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	2	3
CO5	3	3	2	3	3	2

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UCDSP1	LAB: ADVANCED EXCEL	SEC – 3 DS – LAB	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	40	60	100

Curriculum Design and Development	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓					
	National	✓	Local	✓	Regional	✓	Global	✓			
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values		

COURSE DESCRIPTION:

A major goal is to develop better computation skill. Improved critical thinking, decision making and problem solving skills will also be emphasized.

COURSE OBJECTIVES:

The objective of this course is to help the students learn the advanced features of Excel, to summarize, analyze, explore, and present visualizations of data in the form of charts, graphs

COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Handle large amounts of data	**Upto K3**
CO 2	Aggregate numeric data and summarize into categories and subcategories	**Upto K3**
CO 3	Filtering, sorting and grouping data or subsets of data	**Upto K3**
CO 4	Create pivot tables to consolidate data from multiple files	**Upto K3**
CO 5	Presenting data in the form of charts and graphs	**Upto K3**

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

LAB: ADVANCED EXCEL

UNIT I:

Basics of Excel – Customizing common Options–Absolute and relative Cells–Protecting and un–protecting worksheets and cells– Working with Functions – Writing conditional expressions –logical functions –lookup and reference functions–V look UP with Exact Match, Approximate Match–Nested Vlook UP with Exact Match–Vlook UP with Tables, Dynamic Ranges–Nested Vlook UP with Exact Match–Using VLook UP to Consolidate Data from Multiple Sheets.

UNIT II:

Data Validations – Specifying a valid range of values – Specifying a list of valid Values– Specifying custom validations based on formula – Working with Templates Designing the structure of a template–templates for standardization of worksheets – Sorting and Filtering Data –Sorting tables–multiple–level sorting–custom sorting–Filtering data for selected view –advanced filter options–Working with Reports Creating subtotals–Multiple – level subtotal.

UNIT III

Creating Pivot tables Formatting and customizing Pivot tables–advanced options of Pivot tables–Pivot charts– Consolidating data from multiple sheets and files using Pivot tables– external data sources–data consolidation feature to consolidate data–Show Value As %o fRow, % of Column, Running Total, Compare with Specific Field–Viewing Subtotal under Pivot – Creating Slicers.

UNIT IV:

More Functions Date and time Functions–Text functions– Database functions–Power Functions – Formatting Using auto formatting option for worksheets–Using conditional formatting option for rows, columns and cells–What If Analysis–Goal Seek–Data Tables– Scenario Manager.

UNIT V:

Charts –Formatting Charts–3D Graphs–Bar and Line Chart together–Secondary Axis in Graphs–Sharing Charts with PowerPoint / MS Word, Dynamically– New Features Of Excel Sparklines, Inline Charts, data Charts–Overview of all the new features.

TEXT BOOK:

Excel2019 All–in–One For Dummies–2018–GregHarvey

REFERENCE BOOKS:

MicrosoftExcel2019PivotTableDataCrunching–2019,BillJelenandMichaelAlexander

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	2	2	2
CO2	2	3	3	2	3	2
CO3	3	3	3	3	3	3
CO4	3	2	2	3	3	3
CO5	3	3	3	3	3	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level