HAJEE KARUTHA ROWTHER HOWDIA COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University, Madurai.)

Re-Accredited with A++ Grade by NAAC (3rd Cycle)

Uthamapalayam - 625 533.

DEPARTMENT OF COMPUTER SCIENCE

BACHELOR OF SCIENCE – COMPUTER SCIENCE

SYLLABUS

Choice Based Credit System – CBCS

With

Outcome Based Education (OBE)

(Academic Year 2026 - 2027 onwards)

HAJEE KARUTHA ROWTHER HOWDIA COLLEGE

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College Vision and Mission

Vision

Our vision is to provide the best type of higher education to all, especially to students hailing from minority Muslim community, rural agricultural families and other deprived, under privileged sections of the society, inculcating the sense of social responsibility in them. Our college is committed to produce talented, duty-bound citizens to take up the challenges of the changing times.

Mission

Our mission is to impart and inculcate social values, spirit of service and religious tolerance as envisioned by our beloved Founder President Hajee Karutha Rowther.

The Vision beckons.....the Mission continues forever.

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Department Vision and Mission

Vision

The Department of Computer Science envisions to emerge as a centre for academic, software development and extension activities by producing outstanding computer professionals who can independently design, develop and implement computer applications accepting new challenges so as to contribute to the economic well-being of the nation.

Mission

1. Strive and achieve excellent standards of quality education through a well-designed curriculum in tune with the challenging software needs of the industry.

2.Provide excellent undergraduate education in a state-of-the-art environment, preparing students for careers as computer professionals in industry, government and academia

3. Establish institute industry interaction programs to strengthen industry academic relationships for mutual benefit. Support students for their career development, professional growth and to sustain in lifelong learning

Programme Educational Objectives (PEO)

Our graduates will be progressive, efficient, value based, academically excellent, creative, collaborative, empowered and globally competent literates with the skills required for societal change.
They will demonstrate

PEO1	Comprehensive knowledge and expertise, employability, the acumen of creative and critical thinking, the spirit of enquiry and professional attitude required for a successful career
PEO2	Accountability, linguistic competence and communication skills in the work environment and beyond
PEO3	Perseverance, effective collaboration, team spirit, leadership and problem solving skills
PEO4	Keen sense of civility, professional ethics, receptivity and moral righteousness
PEO5	Commitment to address social and environmental threats and to act as responsible service-minded, duty-bound global citizens

Programme Outcomes (PO)

On completion (after three years) of B.Sc. Computer Science programme, the students are able to

PO1	Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design and big data analytics for efficient design of computer-based systems of varying complexity.
PO2	Hardware Knowledge: The ability to understand the digital logic levels, designing digital circuits, PC assembly, Troubleshooting, networking, working of central processing unit, input-output &memory organization, function of microprocessors and assembly language programs.
PO3	Industry Ready: Perceive technical, practical and communicative skills among the students to face the industrial needs.
PO4	Software Engineering Practices: The ability to apply standard practices and strategies in software service management using open-ended programming environments with ability to deliver a quality service for business success.
PO5	Successful Career and Entrepreneurship: The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

Programme Specific Outcomes (PSO)

A graduate of B.Sc. Computer Science after three years will

PSO1	Prepared to be employed in IT industries by providing expected domain knowledge.
PSO2	Provided with practical training, hands-on and project experience to meet the industrial needs.
PSO3	Motivated in career and entrepreneurial skill development to become global leaders.
PSO4	Trained to demonstrate creativity, develop innovative ideas and to work in teams to accomplish a common goal.
PSO5	Addressed with social issues and guided to operate problems with solutions.

Programme Scheme
Eligibility

A Pass in +2 examination conducted by Board of Higher Secondary Education, Government of Tamilnadu or equivalent with Mathematics as one of the subjects.

For Programme Completion
A Candidate shall complete:

- Part I - Language Courses – Tamil/Arabic/Malayalam in semesters I, II, III and IV respectively
- Part II - Language Courses - English in semesters I, II, III, IV respectively
- Part III - Core Courses in semesters I, II, III, IV, V and VI respectively
- Part III - Generic Elective Courses in semesters I, II, III and IV respectively
- Part III - Discipline Elective Courses in semesters IV, V and VI respectively
- Part IV - Foundation Course (Skill Enhancement Course) in Semester I
- Part IV - Entrepreneurial Skills (Skill Enhancement Course) Course in Semester III
- Part IV - Professional Competency Skill (Skill Enhancement Course) Course in Semester V
- Part IV – Non Major Elective (Skill Enhancement Course) Courses in Semesters V and VI respectively
- Part IV - Environmental Studies Course in semester I
- Part IV - Value Education Course in semester III
- Part IV - Summer Internship/Industrial Training Course in semester V
- Part V - Extension activity in semester IV

Scheme of Examinations under Choice Based Credit System

Term End Examinations (TEE)	- 75 Marks
Continuous Internal Assessment Examinations (CIAE)	- 25 Marks
Total	- 100 Marks

Pattern of Continuous Internal Assessment Examinations (CIAE)

Average of Two Internal Tests (each 20 marks)	- 20 Marks
Assignment	- 05 Marks
Total	- 25 Marks

Pattern of Term End Examinations
(Max. Marks: 75 / Time: 3 Hours)

External Examinations Question Paper Pattern for Part I & III and Part IV (Non- Major Elective & Skill based Subject)

Section – A (5 X 1 = 5 Marks)

Answer ALL questions.

- Questions 1 - 5
- One question from each unit
- Multiple choice questions and each question carries Four choices

Section – B (5 X 2 = 10 Marks)

Answer ALL questions.

- Questions 6 - 10
- One question from each unit
- Short Answer (Definition)

Section – C (5 X 6 = 30 Marks)

Answer any ALL questions (Choose either a or b).

- Questions 11 - 15
- One question from each unit
- Paragraph

Section – D (3 X 10 = 30 Marks)

Answer any THREE out of five questions.

- Questions 16 - 20
- One question from each unit
- Essay type

External Examinations Question Paper Pattern for Part IV-
Foundation Course

- MCQ Pattern (1 X 75 = 75 Marks)

External Examinations Question Paper Pattern for Part IV-
Environmental Studies and Value Education

Section – A: (5 X 6 = 30 Marks)

Answer ALL questions choosing either A or B.

- Questions 1 - 5
- Two questions from each unit (either…. or…. type)
- Paragraph

Section – B (3 X 15 = 45 Marks)

Answer any THREE out of five questions.

- Questions 6 – 10
- One question from each unit
- Essay type

Part V (Extension Activities) – 13 Activities

- Internal Evaluation

Passing Marks

Minimum 27 for External Exam
Eligibility for the degree – passing minimum is **40%**

Practical Examination

Internal – 40 marks
External – 60 marks (minimum 24 marks)
Total – 100 marks
Passing minimum is **40%**

Weightage

Weightage for Bloom's Taxonomy	Percentage	Marks	
		CIAE	TEE
Knowledge (Remembering) – K1	15	4	11
Understanding – K2	20	5	15
Applying – K3	25	6	19
Analyzing – K4	40	10	30
Gross Total	**100**	**25**	**75**

Assessment

Distribution of questions and marks for Continuous Internal Assessment Examinations

Bloom's Taxonomy	Section A	Section B	Section C	Section D	Total
Knowledge(K1)	2(2)	2(2)	-	-	**25 marks**
Understanding(K2)	**Assignment (5)**				
Apply(K3)	-	-	2(6)	-	
Analyzing (K4)	-	2(2)	-	1(8)	

Distribution of questions and marks for Term End Examinations.

Bloom's Taxonomy	Section A	Section B	Section C	Section D	Total
Knowledge(K1)	1(1)	2(4)	1(6)	-	**Total 75 Marks**
Understanding(K2)	1(1)	1(2)	2(12)	-	
Apply(K3)	3(3)	2(4)	2(12)	-	
Analyzing (K4)	-	-	-	3(30)	

Note: Figures in parenthesis are Marks

Credits Distribution

S. No	Part	Category	No of Courses	No of Credits
1	Part - I	Language	4	12
2	Part - II	English	4	12
3	Part - III	Core (Theory / Practical / Project)	17	69
		Discipline Elective (Theory / Practical)	4	14
		Generic Elective (Theory / Practical *)	6	16
4	Part - IV (AEC)	Foundation Course	1	2
		EVS	1	2
		Value Education	1	2
		NME	2	4
5	Part - IV (SEC)	Entrepreneurial Skills	1	2
		Professional Competency	1	2
		Internship	1	2
6	Part - V	Extension Activity	1	1
Total			**44**	**140**

* Generic Elective Practical Examinations should be Conducted only in Even Semester

B.Sc., COMPUTER SCIENCE
Details of Course Category, Code, Credits & Title

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max. Marks	Credits
Semester - I							
Part - I							
Language - I	26UTALL11	பொதுத்தமிழ் - I	6	25	75	100	3
	26UARLL11	Introduction to Arabic Language - I					
	26UMMLL11	History of Malayalam Literature					
Part – II							
English - I	26UENLL11	General English - I	6	25	75	100	3
Part – III							
Core – I	26UCSCC11	Programming in C	4	25	75	100	4
Core – II (Lab)	26UCSCC1P	Programming in C Lab	4	40	60	100	4
Generic Elective - I	26UCSGE11	Discrete Mathematics	4	25	75	100	3
Generic Elective – II (Lab)	26UCSGE2P	MS Office Lab	2	-	-	-	-
Part – IV							
Foundation Course (SEC)(MCQ)	26UCSFN11	Digital Principles and Applications	2	25	75	100	2
EVS	26UGEVS11	Environmental Studies	2	25	75	100	2
TOTAL			**30**				**21**

Course Category	Course Code	Course Title	Hrs	CIAE	TEE	Max. Marks	Credits
Semester - II							
Part - I							
Language – II	26UTALL21	பொதுத்தமிழ் - II	6	25	75	100	3
	26UARLL21	Introduction to Arabic Language - II					
	26UMMLL21	Prose, Composition & Translation					
Part – II							
English - II	26UENLL21	General English - II	6	25	75	100	3
Part – III							
Core – III	26UCSCC21	Python Programming	4	25	75	100	4
Core – IV (Lab)	26UCSCC2P	Python and Data Structures Lab	4	40	60	100	4
Core – V	26UCSCC22	Data Structures	4	25	75	100	4
Generic Elective - III	26UCSGE21	Numerical Methods	4	25	75	100	3
Generic Elective – II (Lab)	26UCSGE2P	MS Office Lab	2	40	60	100	2
TOTAL			**30**				**23**

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSCC11	**PROGRAMMING IN C**	**Core-I**	**4**	**4**	**25**	**75**	**100**

Course Objectives		
The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.		
UNIT	**Contents**	**No. of Hours**
I	**Basic structure of C** – Programming style – Constants, variables and Data types – declaration of variables, defining symbolic constants – declaring a variable as constant. **Operators and expressions**: arithmetic expression – evaluation of expressions – Type conversions in expression. **Managing I/O operations**: Reading and writing a character – formatted input and output.	12
II	**Decision making and branching:** Conditional statements – Switch statement – goto statement. Looping statement – Jumps in loops.	12
III	**Arrays:** One dimensional array – two dimensional arrays – multi dimensional array. **Strings**: String variables – reading &writing string– arithmetic operations on strings – putting strings together – comparison – string handling function – table of strings – features of string.	12
IV	**User defined functions:** Elements of user defined function – categories of function – nesting of functions – recursion – scope visibility and life time of variables. **Structures and unions**: Defining a structure – arrays of structures – structures and functions – Unions – size of structures – bit fields.	12
V	**Pointers:** Accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through its pointer. **Files**: Defining, opening, closing a file. I/O operations on files – command line arguments.	12
	Total	**60**

Course Outcomes		**Knowledge Level**
CO	**On completion of this course, students will**	
1	Illustrate the procedural paradigm with variables, constants, operations and I/O functions.	K1,K2,K3,K4
2	Demonstrate the concept of control statements	K1,K2,K3,K4
3	Know the concept of array and strings	K1,K2,K3,K4
4	Expose the concept of functions and structures	K1,K2,K3,K4
5	Reveal the importance of pointers and file	K1,K2,K3,K4
K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze		

Textbooks	
1.	E. Balagurusamy, Edition 8, ***Programming in ANSI C***, Tata McGraw Hill Publishing Company, 2017.
Reference Books	
1.	Herbert Schildt, Edition 4, C: ***The Complete Reference***, Tata McGraw Hill Publishing Company, 2017.
e-Resource	
1.	http://www.tutorialspoint.com/cprogramming/
2.	http://www.programiz.com/c-programming
3.	http://www.programmingsimplified.com/c-program-examples

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	3
CO2	3	1	3	3	3
CO3	3	1	3	3	3
CO4	3	1	3	3	3
CO5	3	1	3	3	3

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2
CO2	3	3	1	3	2
CO3	3	3	1	3	2
CO4	3	3	2	3	1
CO5	3	3	2	3	1

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LECTURE SCHEDULE

Module No.	Topic	No. of Lectures
	UNIT - I	
1.1	Programming style	1
1.2	Constants, variables and Data types	1
1.3	Declaration of variables, defining symbolic constants	1
1.4	Declaring a variable as constant	1
1.5	Operators and expressions	2
1.6	Arithmetic expression – evaluation of expressions	1
1.7	Type conversions in expression	1
1.8	Reading and writing a character	2
1.9	Formatted input and output	2

UNIT - II		
2.1	Conditional statements	3
2.2	Switch statement	2
2.3	Goto statement	1
2.4	Looping statement	4
2.5	Jumps in loops	2
UNIT - III		
3.1	One dimensional array	1
3.2	Two dimensional arrays	2
3.3	Multi-dimensional array	1
3.4	String variables	1
3.5	Reading &writing string	1
3.6	Arithmetic operations on strings	1
3.7	Putting strings together	1
3.8	Comparison	1
3.9	String handling function	2
3.10	Table of strings – features of string	1
UNIT - IV		
4.1	Lements of user defined function	2
4.2	Categories of function	1
4.3	Nesting of functions	1
4.4	Recursion	1
4.5	Scope visibility and life time of variables	2
4.6	Defining a structure	1
4.7	Arrays of structures	1
4.8	Structures and functions	1
4.9	Unions	1
4.10	Size of structures– bit fields	1
UNIT - V		
5.1	Accessing the address of a variable	2
5.2	Declaring, initialization of pointer variables	2
5.3	Accessing a variable through its pointer	2
5.4	Defining, opening, closing a file	2
5.5	I/O operations on files	2
5.6	Command line arguments	2
Total		**60**

Course Designer
Name: Dr. M. Mohamed Meeran
Associate Professor of Computer Science

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSCC1P	**PROGRAMMING IN C LAB**	**Core-II**	**4**	**4**	**40**	**60**	**100**

Course Objectives	
This lab course is designed to create programs, applications in C and leads to learn other languages to switch over to any other language in future.	
LAB EXERCISES	**Required Hours**
Unit I 1. To find Sum of Digits of a number 2. To reverse a given number and check if it is a palindrome 3. To evaluate Sine Series 4. To check if a number is Prime Number or not 5. To solve Quadratic Equation – Switch	20
Unit II 6. To Sort an Array 7. To count the occurrences of a number in a set 8. To reverse a given string and check if it is a palindrome 9. To add and subtract two Matrices 10. To find row wise sum of a matrix of order m x n	20
Unit III 11. To find Factorial value using Recursion 12. To find NCR and NPR values using Function 13. To calculate mean, variance and standard deviation using Function	10
Unit IV 14. To prepare Mark Sheet – Structure	5
Unit V 15. To prepare EB Bill – File	5
TOTAL	**60**

Course Outcomes		**Knowledge Level**
	On completion of this course, students will	
CO1	Understand and write programs using control statements	K1,K2,K3
CO2	Develop programs using arrays	K1,K2,K3
CO3	Develop programs using Functions	K1,K2,K3
CO4	Develop programs using Structure	K1,K2,K3,K4
CO5	Handle files	K1,K2,K3,K4
K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze		

Textbooks	
1.	E. Balagurusamy, Edition 8, ***Programming in ANSI C***, Tata McGraw Hill Publishing Company, 2017.
Reference Books	
1.	Herbert Schildt, Edition 4, C: ***The Complete Reference***, Tata McGraw Hill Publishing Company, 2017.

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	1	3	3	3
CO3	3	2	3	3	3
CO4	2	3	3	3	3
CO5	2	3	3	3	3

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2
CO2	3	3	1	3	2
CO3	3	3	1	3	2
CO4	3	3	2	3	1
CO5	3	3	2	3	1

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LAB SCHEDULE

Module No.	Topic	No. of Hours
UNIT - I		
1.1	To find Sum of Digits of a number	4
1.2	To reverse a given number and check if it is a palindrome	4
1.3	To evaluate Sine Series	4
1.4	To check if a number is Prime Number or not	4
1.5	To solve Quadratic Equation – Switch	4
UNIT - II		
2.1	To Sort an Array	4
2.2	To count the occurrences of a number in a set	4
2.3	To reverse a given string and check if it is a palindrome	4
2.4	To add and subtract two Matrices	4
2.5	To find row wise sum of a matrix of order m x n	4
UNIT - III		
3.1	To find Factorial value using Recursion	3
3.2	To find NCR and NPR values using Function	3
3.3	To calculate mean, variance and standard deviation using Function	4
Unit IV		

4.1	To prepare EB Bill – File	5
Unit V		
5.1	To prepare Mark Sheet – Structure	5
Total		**60**

Course Designer
Name: Dr. M. Mohamed Meeran
Associate Professor of Computer Science

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSGE11	**DISCRETE MATHEMATICS**	**Generic Elective-I**	**4**	**3**	**25**	**75**	**100**

Course Objectives		
This course is designed to provide the basic concepts of mathematical Logic, Set Theory, Number Theory, Functions, Relations and Combinatorics. It equips students with problem – solving skills required for higher studies in mathematics and computer science.		
UNIT	**Contents**	**No. of Hours**
I	**Mathematical logic:** Introduction-Propositions-Connectives-order of Precedence for Logical Connectives-Conditional and Biconditional Propositions-Tautology and Contradiction- Equivalence of Propositions- Duality Law-Duality Theorem- Algebra of Propositions-Tautological Implication-Worked Examples I (A).	12
II	**Set theory:** Introduction- Set Theory – Basic Concepts and Notations – Ordered Pair and Cartesian Product-Set Operations-The Algebraic Laws set Theory – Dual Statement and Principle of Duality- Worked Examples 2 (A) **Relations:** Types of Relations –Some operation Relations – Compositions of Relations –Properties of Relations - Equivalence Classes- Worked Examples 2 (B).	12
III	**NUMBER THEORY:** Introduction –Divisiblity-Prime Numbers-Fundamental Theorem of Arithmetic-The Sieve of Eratoshenes-Division Procedure-Greatest Common Division -Alternative Definition of GCD (a,b)- Least Common Multiple-Congruence-Congruence Class Modulo m- Linear Congruence.	12
IV	**Functions**-Introduction-Representation of a Function-Types of Function –Classification of Function – composition of function-inverse of a Function-Binary and n-ary Operations-properties of binary operations- Worked Examples 4 (A)**.**	12
V	**Combinatorics:** Introduction- Permutations and Combinations-Pascal's Identity- Vandermonde's Identity-Permutations with Repetition-Circular Permutations- The Pigeonhole Principle-Generalisation of the Pigeonhole Principle – Principle of Inclusion –Exculsion-Worked Examples 6 (A).	12
	Total	**60**

Course Outcomes		**Knowledge Level**
CO	**On completion of this course, students will be able**	
1	To understand, analyse and simplify different mathematical logics.	K1,K2

2	Explain the various properties of Sets and Relations.	K1,K2,K3
3	To solve problems involving divisiblity, GCD,LCM and congruences using number –theoretic methods	K1,K2,K3,K4
4	To classify functions and analyse binary and n-ary operations with their properties	K1,K2
5	To solve counting problems using Permutations, Combinations, and the pigeonhole principle.	K1,K2,K3,K4
K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze		
Textbooks		
1.	T.Veerarajan "***Discrete Mathematics with Graph Theory and Combinatorics***" McGraw Hill education (India) Pvt. ltd. 2013	
Reference Books		
1.	***Discrete Mathematics*****,** Swapan Kumar Sarkar,S. Chand and company limited, New Delhi,	
2.	***Fundamentals of Discrete Mathematical Structures***, K.R.Chowdhary, PHI Learning Private Limited, New Delhi-2012.	

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	2	3	3	2	2
CO3	3	2	2	2	1
CO4	2	3	3	2	2
CO5	2	3	2	3	1

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1
CO2	2	3	3	2	2
CO3	3	2	2	2	1
CO4	2	3	3	2	2
CO5	2	3	2	3	1

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LECTURE SCHEDULE

Module No.	Topic	No. of Lectures
UNIT – I		
1.1	Introduction-Propositions-Connectives	2
1.2	order of Precedence for Logical Connectives-Conditional and Biconditional Propositions	2
1.3	Tautology and Contradiction- Equivalence of Propositions	2

1.4	Duality Law-Duality Theorem- Algebra of Propositions	2
1.5	Tautological Implication-Worked Examples I (A)	4
UNIT – II		
2.1	Set Theory – Basic Concepts and Notations	2
2.2	Ordered Pair and Cartesian Product-Set Operations	2
2.3	The Algebraic Laws set Theory – Dual Statement and Principle of Duality	2
2.4	Relations :Types of Relations –Some operation Relations	2
2.5	Compositions Relations –Properties of Relations	2
2.6	Equivalence Classes- Worked Examples 2 (B)	2
UNIT – III		
3.1	Introduction –Divisiblity-Prime Numbers	2
3.2	Fundamental Theorem of Arithmetic-The Sieve of Eratoshenes	2
3.3	Division Procedure-Greatest Common Division	2
3.4	Alternative Definition of GCD (a,b)- Least Common Multiple	2
3.5	Congruence Class Modulo m-Linear Congruence.	4
UNIT – IV		
4.1	Introduction-Representation of a Function	2
4.2	Types of Function	3
4.3	Classification of Function-Composition of function	2
4.4	Inverse of a Function-Binary and n-Ary Operations	2
4.5	properties of binary operations- Worked Examples 4 (A).	3
UNIT – V		
5.1	Introduction	1
5.2	Permutations	3
5.3	Combinations	3
5.4	Circular Permutations- The pigeonhole principle	1
5.5	Worked Examples 6 (A)	4
Total		**60**

Course Designer
Name: Dr. S. SEYADALI FATHIMA
Assistant Professor of Mathematics

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSFN11	**DIGITAL PRINCIPLES AND APPLICATIONS**	**Foundation Course (SEC)(MCQ)**	**2**	**2**	**25**	**75**	**100**

Course Objectives

The course enables the students to learn and understand the fundamental concepts of digital principles and apply the knowledge gained to design digital circuits.

UNIT	Contents	No. of Hours
I	Binary Number system – Binary to decimal –decimal to binary – Octal-hexa decimal- – ASCII code – Excess-3 Code – Gray code.	6
II	The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.	6
III	Boolean Laws and Theorems. - Sum of Products method - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don't Care Conditions- Product-of sums method -Product-of sums Simplifications.	6
IV	Multiplexers – Demultiplexers-1 to 16 Decoder – BDC-to-decimal Decoders – Seven-segment Decoders – Encoders – Exclusive-OR Gates-Parity Generators and Checkers.	6
V	Binary Addition- Binary Subtraction – 2'S Complement Representation - 2'S Complement Arithmetic – Arithmetic Building Blocks.	6
	Total	**30**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Learn and understand the various number systems and codes	K1,K2,K3,K4
2	Understand and construct simple logic circuits	K1,K2,K3,K4
3	Design and build converters	K1,K2,K3,K4
4	Gain knowledge about binary arithmetic and design arithmetic building blocks	K1,K2,K3,K4
5	Construct various flip flops	K1,K2,K3,K4

K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze

Textbooks

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, ***Digital Principals and Applications*** – Eighth edition, The McGraw-Hill Companies – 2018.

Reference Books

1. Anil K. Maini, ***Digital Electronics Principles***, Devices and Applications, John Wiley & Sons Ltd, 2007.

e-Resource

1. https://studylib.net/doc/26329433/pdfcoffee.com-digital-principles-and-application-by-leach...
2. https://www.geeksforgeeks.org/digital-logic/digital-electronics-logic-design-tutorials/

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	1	3	2	1	2
CO2	1	3	2	1	2
CO3	2	3	2	1	2
CO4	2	3	2	1	2
CO5	2	3	2	1	2

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	1	2
CO2	2	2	2	1	2
CO3	2	2	2	1	2
CO4	2	2	2	1	2
CO5	2	2	2	1	2

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LECTURE SCHEDULE

Module No.	Topic	No. of Lectures
	UNIT - I	
1.1	Binary Number system	1
1.2	Binary to decimal	1
1.3	decimal to binary	1
1.4	Octal-hexa decimal	1
1.5	ASCII code	1
1.6	Excess-3 Code – Gray code	1
	UNIT - II	
2.1	The Basic Gates	1
2.2	NOT	1
2.3	OR	1
2.4	AND	1
2.5	Universal Logic Gates – NOR	1
2.6	Universal Logic Gates –NAND	1
	UNIT - III	
3.1	Boolean Laws and Theorems	1
3.2	Sum of Products method	1
3.3	Truth table to Karnaugh Map	1

3.4	Pairs, Quads, Octets – Don't Care	1
3.5	Product-of sums method	1
3.6	Product-of sums Simplifications	1
UNIT - IV		
4.1	Multiplexers – Demultiplexers	1
4.2	1 to 16 Decoder	1
4.3	BCD-to-decimal Decoders	1
4.4	Seven-segment Decoders	1
4.5	Encoders-Exclusive-OR Gates	1
4.6	Parity Generators and Checkers	1
UNIT - V		
5.1	Binary Addition	2
5.2	Binary Subtraction	1
5.3	2'S Complement Representation	1
5.4	2'S Complement Arithmetic	1
5.5	Arithmetic Building Blocks	1
Total		**30**

Course Designer
Name: Ms. S. Sophia Rani
Assistant Professor of Computer Science

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSCC21	**PYTHON PROGRAMMING**	**Core-III**	**4**	**4**	**25**	**75**	**100**

Course Objectives

The course is designed to provide complete knowledge of python language. Students will be able to develop programs, applications in python. Also the students learn about the concepts of List, Dictionary and file handing in python.

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.	12
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..	12
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.	12
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.	12
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.	12
	Total	**60**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Illustrate the procedural paradigm with variables, constants, operations and I/O functions.	K1,K2,K3,K4
2	Demonstrate the concept of control statements	K1,K2,K3,K4
3	Know the concept of functions ,string and modules	K1,K2,K3,K4

4	Expose the concept of list and dictionary	K1,K2,K3,K4
5	Reveal the importance file handling	K1,K2,K3,K4
K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze		
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.	
2.	Mark Lutz, "***Learning Python***", Orielly.	
3.	Adam Stewarts, "***Python Programming***", Online.	
4.	Kenneth A. Lambert, "***Fundamentals of Python – First Programs***", CENGAGE Publication	
e-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/	

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	2	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	2	3
CO5	3	2	3	3	3

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	3	2	3	3	3

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LECTURE SCHEDULE

Module No.	Topic	No. of Lectures
	UNIT - I	
1.1	History of Python-Features of Python	1
1.2	Literals, Constants, variables	1
1.3	Identifiers–Keywords-Built-in Data Types	1
1.4	Output Statements – Input Statements	1
1.5	Comments – Indentation	2
1.6	Operators and expressions	1
1.7	Type conversions.	1
1.8	Defining and Processing Arrays	2
1.9	Array methods	2
	UNIT - II	
2.1	Selection/Conditional Branching statements: if, if-else	2
2.2	nested if and if-elif-else statements	3
2.3	**Iterative Statements**: while loop, for loop	2
2.4	else suite in loop and nested loops	2
2.5	**Jump Statements:** break	1
2.6	continue	1
2.7	pass statements**.**	1
	UNIT - III	
3.1	**Functions:** Function Definition – Function Call	1
3.2	Variable Scope and its Lifetime	1
3.3	Return Statement	1
3.4	**Function Arguments**: Required Arguments,Keyword Arguments	1
3.5	Default Arguments and Variable Length Arguments - Recursion	2
3.6	**Python Strings:** String operations- Immutable Strings	1
3.7	Built-in String Methods and Functions- String Comparison	2
3.8	**Modules**: import statement- The Python module	1
3.9	dir() function – Modules and Namespace	1
3.10	Defining our own modules.	1
	UNIT - IV	
4.1	**Lists:** Creating a list -Access values in List-Updating values in Lists	2
4.2	Nested lists -Basic list operations-List Methods	2
4.3	Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple	2
4.4	Nested tuples– Difference between lists and tuples	2
4.5	**Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary	2

4.6	Dictionary Functions and Methods - Difference between Lists and Dictionaries.	2
UNIT - V		
5.1	**Python File Handling:** Types of files in Python - Opening and Closing files	4
5.2	Reading and Writing files: write() and writelines() methods-append() method	2
5.3	read() and readlines() methods – with keyword – Splitting words	2
5.4	File methods - File Positions- Renaming and deleting files.	4
Total		**60**

Course Designer
Name: Ms Fathima Kaleema J
Assistant Professor of Computer Science

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSCC2P	**PYTHON AND DATA STRUCTURES LAB**	**Core-IV(Lab)**	**4**	**4**	**40**	**60**	**100**

Course Objectives	
This lab course is designed to create programs, applications in python and leads to learn data structures and implementing them using python..	
LAB EXERCISES	**Required Hours**
Python: **Unit I** 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.	16
Unit II 5. Program using Functions. 6. Program using Arrays. 7. Program using Strings. 8. Program for File Handling.	16
Data Structures: **Unit III** 9. Write programs for implementing the following searching methods: • Linear search • Binary search. 10. Write programs for implementing the following sorting methods: • Bubble sort • Selection sort • Insertion sort	8
Unit IV 11. Write a program to implement the linked list 12. Write a program to implement the stack using a singly linked list. 13. Write a program to implement the queue using a singly linked list.	
Unit V 14. Write programs to perform the following operations: • Insert an element into a binary search tree. • Delete an element from a binary search tree.	12
15. Write a program to Search for a key element in a binary search tree.	8
TOTAL	**60**
Course Outcomes	**Knowledge**

		Level
	On completion of this course, students will	
CO1	create loops and decision statements in Python.	K1,K2,K3
CO2	work with functions and handling files in Python.	K1,K2,K3
CO3	Learn and Implement sorting and searching algorithms	K1,K2,K3
CO4	Learn and implement linear data structures-lists, stacks, queues.	K1,K2,K3,K4
CO5	Learn and implement Trees.	K1,K2,K3,K4
Textbooks		
1.	Reema Thareja, "***Python Programming using problem solving approach***", First Edition, 2017, Oxford University Press.	
2.	Dr. R. Nageswara Rao, "***Core Python Programming***", First Edition, 2017, Dream tech Publishers	
3.	Data Structure & Algorithms Concepts, Techniques and applications, GAVPAI, Tata McGraw Hill.	
Reference Books		
1.	VamsiKurama, "***Python Programming***: A Modern Approach", Pearson Education.	
2.	Mark Lutz, "Learning Python", Orielly.	

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3
CO2	2	2	3	2	3
CO3	3	2	2	3	2
CO4	3	3	3	2	3
CO5	1	2	3	3	3

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's:

CO /PSO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	2	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	2	3
CO5	3	2	3	3	3

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LAB SCHEDULE

Module No.	Topic	No. of Hours
UNIT - I		
1.1	Program using variables, constants, I/O statements in Python.	4
1.2	Program using Operators in Python.	4

1.3	Program using Conditional Statements.	4
1.4	Program using Loops.	4
UNIT - II		
2.1	Program using Functions.	4
2.2	Program using Arrays.	4
2.3	Program using Strings.	4
2.4	Program for File Handling	4
UNIT - III		
3.1	Write programs for implementing the following searching methods: • Linear search • Binary search.	4
3.2	Write programs for implementing the following sorting methods: • Bubble sort • Selection sort • Insertion sort	4
UNIT - IV		
4.1	Write a program to implement the linked list	4
4.2	Write a program to implement the stack using a singly linked list.	4
4.2	Write a program to implement the queue using a singly linked list	4
UNIT - V		
5.1	Write programs to perform the following operations: • Insert an element into a binary search tree. • Delete an element from a binary search tree.	4
5.2	Write a program to Search for a key element in a binary search tree.	4
Total		**60**

Course Designer
Name: Ms. Fathima Kaleema J
Assistant Professor of Computer Science

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSCC22	**DATA STRUCTURES**	**Core-V**	**4**	**4**	**25**	**75**	**100**

Course Objectives

The course on Data Structures stresses much on effective programming than focusing on the syntax/semantics of any programming language. In other words, this course views the problem solving not just as solving the problem somehow but about solving the problem in the most efficient way. Choice of an appropriate data structure greatly influences the characteristics of the obtained solution such as performance, space requirements, scalability, reuse, robustness etc..

UNIT	Contents	No. of Hours
I	**Arrays, Records**: Introduction- Linear Arrays – Representation of Linear Arrays in Memory – Traversing Linear Arrays – Inserting and Deleting – Sorting – Bubble Sort – Searching –Linear Search – Binary Search –Multidimensional Arrays – Records – Record Structures – Representation of Records in Memory.	12
II	**Linked Lists**: Introduction – Linked Lists – Representation of Linked Lists in Memory – Traversing a Linked List – Searching a Linked List – **Memory Allocation**: Garbage Collection- Insertion into a Linked List – Deletion from a Linked List.	12
III	**Stacks**: Introduction – Stacks – Array Representation of Stacks – Linked Representation of Stacks –Application of Stacks – Recursion – Towers of Hanoi – Implementation of Recursive Procedure by stacks.	12
IV	**Queues**: Queues – Representation of Queues - Linked Representation of Queues – De-queues – Priority Queues – Array Representation of a Priority Queue.	12
V	**Trees**: Introduction – Binary Trees – Representing Binary Trees in Memory – Traversing Binary Trees – Binary Search Trees – Searching and Inserting in Binary Search Trees – Application of Binary Search Trees.	12
	Total	**60**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Understand the data structures concepts such as arrays and records.	K1,K2,K3,K4
2	Make use of linked list	K1,K2,K3,K4
3	Understand the stack and its applications	K1,K2,K3,K4
4	Understand the queue and its applications	K1,K2,K3,K4
5	Make use of trees, binary search trees	K1,K2,K3,K4

K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze

Textbooks

1. Seymour Lipschut, ***Data Structures***, Tata McGraw Hill.

Reference Books	
1.	Data Structure & Algorithms Concepts, ***Techniques and applications***, GAVPAI, Tata McGraw Hill.
2.	S. Sharanya, ***Data Structures & Algorithms***, Charulatha Publications.
e-Resources	
1.	https://www.w3schools.com/dsa/dsa_intro.php
2.	https://www.tutorialspoint.com/data_structures_algorithms/index.htm
3.	https://www.geeksforgeeks.org/dsa/dsa-tutorial-learn-data-structures-and-algorithms/

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	3
CO2	3	1	3	3	3
CO3	3	1	3	3	3
CO4	3	1	3	3	3
CO5	3	1	3	3	3

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	3	3
CO2	3	2	3	2	3
CO3	3	1	2	3	3
CO4	3	2	2	2	3
CO5	3	1	3	2	3

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LECTURE SCHEDULE

Module No.	Topic	No. of Lectures
UNIT - I		
1.1	Introduction- Linear Arrays	1
1.2	Representation of Linear Arrays in Memory	1
1.3	Traversing Linear Arrays	1
1.4	Inserting and Deleting	2
1.5	Bubble Sort	1
1.6	Linear Search – Binary Search	2
1.7	Multidimensional Arrays	2
1.8	Records – Record Structures	1
1.9	Representation of Records in Memory	1
UNIT - II		

2.1	Introduction – Linked Lists	2
2.2	Representation of Linked Lists in Memory	2
2.3	Traversing a Linked List	2
2.4	Searching a Linked List	2
2.5	Memory Allocation	2
2.6	Insertion into a Linked List	1
2.7	Deletion from a Linked List	1
UNIT - III		
3.1	**Stacks**: Introduction	1
3.2	Array Representation of Stacks	2
3.3	Linked Representation of Stacks	2
3.4	Application of Stacks	2
3.5	Recursion	2
3.6	Towers of Hanoi	1
3.7	Implementation of Recursive Procedure by stacks	2
UNIT - IV		
4.1	**Queues**: Queues	2
4.2	Representation of Queues	2
4.3	Linked Representation of Queues	2
4.4	De-queues	2
4.5	Priority Queues	2
4.6	Array Representation of a Priority Queue	2
UNIT - V		
5.1	**Trees**: Introduction – Binary Trees	2
5.2	Representing Binary Trees in Memory	2
5.3	Traversing Binary Trees	2
5.4	Binary Search Trees	2
5.5	Searching and Inserting in Binary Search Trees	2
5.6	Application of Binary Search Trees	2
Total		**60**

Course Designer
Name: Dr. M. Mohamed Meeran
Associate Professor of Computer Science.

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSGE21	**NUMERICAL METHODS**	**Generic Elective-III**	**4**	**3**	**25**	**75**	**100**

Course Objectives

This course provides an introduction to the basic concepts and techniques of numerical solution of algebraic equation, system of algebraic equation, numerical solution differentiation, integration and applications of computer science and to develop the mathematical skills of the students in the areas of numerical methods.

UNIT	Contents	No. of Hours
I	**Algebraic and Transcendental Equations:** Iteration Method – Aitken's method- Bisection method – Regula Falsi method – Newton Raphson method	12
II	**Simultaneous equations:** Gauss elimination method – Gauss Jordan method–Gauss Jacobi iteration method - Gauss seidel iteration methods.	12
III	**Interpolation:** Newton's interpolation formulae – central difference interpolation formulae – Lagrange's interpolation formulae – Inverse interpolation.	12
IV	**Numerical differentiation:** Derivatives using Newton's forward and Backward formulae – Maxima and Minima of the interpolating polynomial - **Numerical Integration:** Trapezoidal rule – Simpson's rule**.**	12
V	**Numerical solution of differential equations:** Taylor's series method - Euler's method – Runge Kutta methods.	12
	Total	**60**

Course Outcomes		Knowledge Level
CO	**On completion of this course, students will**	
1	Select appropriate method for finding numerical solutions of algebraic and transcendental equations.	K1,K2,K3
2	Find approximate solutions to simultaneous equation	K1,K2,K3
3	Solve mathematical problems such as interpolation	K1,K2,K3,K4
4	Enable the students to solve Numerical differentiation and Numerical Integration	K1,K2,K3,K4
5	Enable the students to solve differential equation and partial differential equations numerically	K1,K2,K3,K4

K1-Knowledge, K2-Understand, K3-Apply, K4- Analyze

Textbooks

1. S. Arumugam and A.Thangapandi ISSAC., "***Numerical Analysis with programming in C",*** New gamma Publication, Palayankottai.

Reference Books

1.	T. Veerarajan & T. Ramachandran, "***Numerical Methods, Second Edition",*** Tata McGraw Hill, 2006.
2.	P. Thangaraj, "***Computer – Oriented Numerical Methods",*** Prentice Hall of India, Pvt. Ltd, New Delhi, 2008

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	1
CO2	3	2	1	2	1
CO3	3	2	1	2	1
CO4	3	2	1	2	1
CO5	3	2	1	2	1

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	3	3
CO2	3	1	3	1	3
CO3	2	1	3	3	2
CO4	2	1	2	3	3
CO5	3	1	3	2	3

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LECTURE SCHEDULE

Module No.	Topic	No. of Lectures
	UNIT – I	
1.1	Algebraic and Transcendental Equations	1
1.2	Iteration Method	2
1.3	Aitken's Method	1
1.4	Bisection method	2
1.5	Regula Falsi method	3
1.6	Newton Raphson method.	3
	UNIT – II	
2.1	Gauss elimination method	2
2.2	Gauss Jordan method	2
2.3	Gauss Jacobi iteration method	4
2.4	Gauss seidel iteration methods.	4
	UNIT – III	

3.1	Newton's interpolation formulae	4
3.2	Central difference interpolation formulae	4
3.3	Lagrange's interpolation formulae	2
3.4	Inverse interpolation.	2
UNIT – IV		
4.1	Newton's forward differentiation	2
4.2	Backward differentiation	2
4.3	Maxima of the interpolating polynomial	2
4.4	Minima of the interpolating polynomial	2
4.5	Trapezoidal role	2
4.6	Simpson's rule	2
UNIT – V		
5.1	Taylor's series method	4
5.2	Euler's method	4
5.3	Runge Kutta method.	4
Total		**60**

Course Designer
Name: Dr. S. Seyadali Fathima
Assistant Professor of Mathematics

Course Code	Course Title	Category	Hours	Credits	Marks		
					CIAE	TEE	Total
26UCSGE2P	**MS OFFICE LAB**	**Generic Elective – II(Lab)**	**2**	**2**	**40**	**60**	**100**

Course Objectives	
Microsoft Office tools help organizations collect, manage, and analyze data securely to accomplish everyday tasks and processes. This course is designed to provide hands-on training in Microsoft Office tools to optimize and automate existing business processes, documentation, and data management procedures.	
LAB EXERCISES	**Required Hours**
Unit I **MICROSOFT WORD** 1. Resume Preparation: Create a professional Bio-Data using various formatting features such as font styles, sizes, alignment, and line spacing. Use Tables to list educational qualifications and Bullets/Numbering for technical skills. 2. Newsletter Design: Design a single-page newsletter using Multi-column layout (2 or 3 columns). Incorporate WordArt for the title, Drop Cap for paragraphs, and insert Images with text wrapping. 3. Mail Merge: Prepare an invitation letter for a Department Seminar. Use the Mail Merge feature to send the personalized invitation to at least 10 different students using an external data source. 4. Header, Footer & Table of Contents: Create a 5-page report. Include a professional Header and Footer (with page numbers), use Styles. 5. Mathematical & Scientific Documents: Create a document that includes complex Mathematical Equations, Chemical Formulas (using Subscript/Superscript), and special Symbols **Unit II** **MICROSOFT EXCEL** 6. Student Mark Analysis: Create a worksheet with Student Name and marks for five subjects. Use formulas to calculate the Total, Average, and Result (using the IF condition: Pass if all subjects > 40, else Fail). 7. Payroll System: Prepare a Salary Bill for 10 employees. Calculate DA (12% of Basic), HRA (5% of Basic), and PF (10% of Basic). Find the Gross Pay and Net Pay using arithmetic formulas. 8. Data Visualization (Charts): Enter the sales data of a company for the last 5 years. Create a Column Chart and a Pie Chart to represent the data. Apply chart titles, axis labels, and legends. 9. Sorting and Filtering: Create a worksheet of books in a library. Perform Multi-level Sorting (by Subject and then by Author) and use Auto-Filters to	12 12

display books published after a specific year. 10. Statistical Functions: Demonstrate Statistical functions using MS-Excel. **Unit III** **MICROSOFT POWERPOINT:** 11. College Profile Presentation: Create a presentation about your college. Use different Slide Layouts, Background Designs, and insert the college logo, founder's photo, NIRF Logo, NAAC logo etc. 12. Educational Quiz with Hyperlinks: Create a quiz containing 10 questions. If the user clicks the wrong answer, use a Hyperlink to go to a "Try Again" slide; if correct, link to the "Congratulations" slide. 13. Product Advertisement: Create a presentation with Custom Animations (Minimum 10). 14. Photo Album with Audio: Create a presentation using the Insert Photo Album feature. Apply a consistent theme to all slides and insert a background audio file that plays across all slides. 15. Template Design: Create a custom presentation template. Ensure that a logo and specific footer text appear automatically on every new slide created (Minimum 10 slides) **MICROSOFT ACCESS** **Unit IV** 16. Creation of Tables: Create a Student_Database table. Define Data Types (Text for Name, Number for Roll No, Date for DOB) and set a Primary Key. 17. Form Design: Create an user-friendly Data Entry Form for the Student_Database table to allow users to add new records without looking at the raw table. 18. Query Processing: Create a Product table including prices field. Run a Query to filter and display only those products whose price is greater than ₹500. **Unit V** 19. Report Generation: Create a Library Management database. Use the Report Wizard to generate a professional, printable report of all books currently borrowed, grouped by "Category." 20. Relational Database (Table Linking): Create two tables ("Author" and "Books"). Establish a One-to-Many Relationship between them and create a query that displays book names along with their respective author names.	12 12 12
TOTAL	**60**

Course Outcomes		**Knowledge Level**
	On completion of this course, students will	
CO1	Use the word processor ,Merge Mails , prepare resume and design a newsletter.	K1,K2,K3
CO2	Understand the concepts of Spread Sheet ,Visualize the data using charts and also know how to sort and filter the data sheet.	K1,K2,K3

CO3	Illustrate various options of power point presentation Demonstrate custom animation and insert photo album features.	K1,K2,K3
CO4	Create tables, design forms and process Queries in database.	K1,K2,K3,K4
CO5	Generate reports and use relational database with query in it.	K1,K2,K3,K4
Textbooks		
1.	Dr P Umaeswari, Dr S Senthil Kumar, P Chandrasekar ***Office Automation***, VIR Publication, 2021.	
Reference Books		
1.	Dinesh Maidasani, ***3rd Edition Learning Computer Fundamentals***, MS Office and Internet & Web Technology – Firewall Media,2016	

Mapping with Programme Outcomes:

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	3	2
CO2	3	3	3	3	2
CO3	2	2	3	2	2
CO4	3	3	2	3	1
CO5	3	3	2	3	2

Strong-3 Medium-2 Low-1

Level of Correlation between PSO's and CO's:

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	1	1	3	2
CO2	3	3	3	3	2
CO3	2	2	1	2	2
CO4	3	3	2	3	1
CO5	3	3	2	3	1

Strong-3 Medium-2 Low-1

COURSE CONTENTS AND LAB SCHEDULE

Module No.	Topic	No. of Hours
UNIT – I		
1.1	Resume Preparation	3
1.2	Newsletter Design	2
1.3	Mail Merge	2
1.4	Header, Footer & Table of Contents	2
1.5	Mathematical & Scientific Documents	3
UNIT – II		
2.1	Student Mark Analysis	3
2.2	Payroll System	2

2.3	Data Visualization (Charts)	2
2.4	Sorting and Filtering	2
2.5	Statistical Functions	3
UNIT – III		
3.1	College Profile Presentation	2
3.2	Educational Quiz with Hyperlinks	3
3.3	Product Advertisement	2
3.4	Photo Album with Audio	2
3.5	Template Design	3
UNIT – IV		
4.1	Creation of Tables	5
4.2	Form Design	5
4.3	Query Processing	2
UNIT – V		
5.1	Report Generation	6
5.2	Relational Database (Table Linking)	6
	TOTAL	**60**

Course Designer
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