DEPARTMENT PROFILE

The Department of Computer Science was established in 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 for, the Department has produced more than 1000 (30 batches) Computer Science graduates and they are all well placed in India & Abroad. The Department has been producing excellent results over a period of 30 years. The Department has adequate infrastructure with a well equipped Computer Laboratory, a well stacked Department Library, well furnished class rooms, a separate room for power point presentation with a LCD Projector.

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 errands of a 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 upgradation of curriculum.

Signature of the Chairman/HOD

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22) 462

DISTRIBUTION OF CREDITS (UG PROGRAMME)

PART	SEM	COURSES	NO.OF COURSES	HOURS	CREDITS	TOTAL CREDITS
I	I-IV	LANGUAGE	4	6	3	12
II	I-IV	ENGLISH	4	6	3	12
III	I-VI	CORE	15-20	4-6	4-5	60
III	I-IV	ALLIED	4	5	5	20
III	V,VI	ELECTIVE	3	5	5	15
IV	I-IV	SKILL BASED SUBJECT(SBS)	4	3	3	12
IV	I	VALUE EDUCATION	1	2	2	2
IV	II	ENVIRONMENTAL STUDIES	1	2	2	2
IV	III,IV	NON-MAJOR ELECTIVE(NME)	2	2	2	4
V	IV	EXT.ACTIVITY	1	0	1	1
TOTAL CREDITS						**140**

Undergraduate (UG) Programme Outcomes (POs)

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.

PO 1	**Critical Thinking**: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO 2	**Problem Solving**: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO 3	**Effective Communication**: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO 4	**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.
PO 5	**Environmental Concern and Sustainable Growth**: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO 6	**Skill Development and Employable Abilities**: Adequate training in relevant skill sector and creating employable abilities among the under graduates.

Passed in the BOS Meeting held on 18-03-2020

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion of B.Sc. Computer Science Programme, the students are expected to

PSO 1	develop as professionally competent citizens by applying the scientific knowledge of Computer Science with the ability to think clearly, rationally and creatively to support in evolving solutions to the social/public/scientific issues with responsible democratic participation
PSO 2	enterprise resourcefulness to identify, plan, formulate, design and evaluate solutions for complex computing problems that address the specific needs with appropriate consideration for Societal, Cultural, Environmental and Industrial domains.
PSO 3	develop holistically to ignite the lateral thinking ability in problem solving, acquisition of new skills, open-minded and organized way of facing problems with self awareness and evolving analytical solutions
PSO 4	create and initiate innovations effectively and communicate efficiently with the computing community and society at large to bridge the gap between computing industry and academia
PSO 5	understand, assess and commit to professional and ethical principles, norms and responsibilities of the cyber world through Digital Literacy and gain the ability for work efficacy as a part of a team and engage effectively with diverse stakeholders
PSO 6	acquire ability and willingness to embark on new ventures and initiatives with critical thinking and desire for more continuous learning focusing on life skills.

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   464

B.Sc. COMPUTER SCIENCE - COURSE STRUCTURE

I SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	Total Marks	Credits
1	21UACT11/ H11/S11	Tamil/Hindi/Sanskrit	6	3	100	3
2	21UACE11	English	6	3	100	3
3	21UCSC11	Core-1: Programming in C	5	3	100	5
4	21UCSCP1	Core-2: Practical I: C Programming	5	3	100	3
5	21UCSA11	Allied-1:Discrete Structures	4	3	100	4
6	21UCSS11	SBS-1:Digital Computer Fundamentals	2	3	100	2
7	21UACVE1	Value Education	2	3	100	2
		TOTAL	30		700	22

II SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	Total Marks	Credits
1	21UACT21/ H21/S21	Tamil/Hindi/Sanskrit	6	3	100	3
2	21UACE21	English	6	3	100	3
3	21UCSC21	Core-3: Data Structures And Algorithms	5	3	100	5
4	21UCSCP2	Core-4: Practical II: Data Structures Using C	5	3	100	3
5	21UCSA21	Allied-2: Probability and Statistics	4	3	100	4
6	21UCSS21	SBS-2: Computer Organization & Architecture	2	3	100	2
7	21UACES1	Environmental Studies	2	3	100	2
		TOTAL	30		700	22

Passed in the BOS Meeting held on 18-03-2020

III SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	Total Marks	Credits
1		Tamil/Hindi/Sanskrit	6	3	100	3
2		English	6	3	100	3
3		Core-5:Object Oriented Programming Using C++	5	3	100	5
4		Core-6: Practical III: Object Oriented Programming Using C++	5	3	100	3
5		Allied 3:Resource Management Techniques	4	3	100	4
6		SBS-3: Practical IV Linux & Shell Programming	2	3	100	2
7		NME-1	2	3	100	2
		TOTAL	30		700	22

IV SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	Total Marks	Credits
1		Tamil/Hindi/Sanskrit	6	3	100	3
2		English	6	3	100	3
3		Core-7 : Programming in Java	5	3	100	5
4		Core-8 : Practical V: Java programming	5	3	100	3
5		Allied-4 : Numerical Methods	4	3	100	4
6		SBS-4 : Visual Basic Lab	2	3	100	2
7		NME-2	2	3	100	2
8		Extension Activity	-	-	100	1
		TOTAL	30		700	23

Passed in the BOS Meeting held on 18-03-2020

V SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	Total Marks	Credits
1		Core-9: Operating Systems	6	3	100	5
2		Core-10: Relational Database Management	5	3	100	4
3		Core-11: Practical VI: Web Technology	5	3	100	3
4		Core-12: Software Engineering	5	3	100	4
5		Elective-1: Web Technology	5	3	100	5
6		SBS-5: Quantitative Aptitude	2	3	100	2
7		SBS-6: Practical VII : SQL and PLSQL	2	3	100	2
8		Soft Skills	-	-	100	-
		TOTAL	30		800	25

VI SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	Total Marks	Credits
1		Core-13: Computer Graphics	5	3	100	4
2		Core-14: Practical VIII : Python Programming	5	3	100	4
3		Core-15: Computer Networks	5	3	100	4
4		Core-16: Practical IX : Open Source Technology Lab	5	3	100	4
5		Elective-2: Data mining and Warehousing	5	3	100	5
6		Elective-3: Project & Viva-Voce	5	3	100	5
7		GK	-	-	100	-
		TOTAL	30		700	26

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   467

ELECTIVE: 1

S.NO.	SUB.CODE	SUBJECT TITLE
1		WEB TECHNOLOGY
2		CLOUD COMPUTING
3		SOFTWARE TESTING
4.		INTRODUCTION TO ARTIFICIAL INTELLIGENCE

ELECTIVE: 2

S.NO.	SUB.CODE	SUBJECT TITLE
1		PROGRAMMING IN PYTHON
2		PHP PROGRAMMING
3		DATA MINING AND WAREHOUSING
4.		BIG DATA FUNDAMENTALS

ELECTIVE: 3

S.NO.	SUB.CODE	SUBJECT TITLE
1		MOBILE COMPUTING
2		NETWORK SECURITY
3		E-COMMERCE TECHNOLOGIES
4		PROJECT & VIVA-VOCE

ABSTRACT

S.No.	PART	No. of PAPERS	CREDITS
1.	I	4	12
2	II	4	12
3	III-CORE	16	64
	III-ALLIED	4	16
	III-ELECTIVE	3	15
4	IV- SBS	6	12
	IV-NME	2	4
	IV-VE	1	2
	IV-EVS	1	2
5	V-EXT. ACTIVITY	1	1
6.	SELF-STUDY	2 (SS,GK)	0
	TOTAL	44 PAPERS	140 CREDITS

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

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

B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

I SEMESTER

S. No.	Sub Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Cre
1	21UACT11/ H11/S11	Tamil/Hindi/Sanskrit	6	3	25	75	100	3
2	21UACE11	English	6	3	25	75	100	3
3	21UCSC11	Core-1: Programming in C	5	3	25	75	100	5
4	21UCSCP1	Core-2: Practical I: C Programming	5	3	40	60	100	3
5	21UCSA11	Allied-1:Discrete Structures	4	3	25	75	100	4
6	21UCSS11	SBS-1:Digital Computer Fundamentals	2	3	25	75	100	2
7	21UACVE1	Value Education	2	3	25	75	100	2
		TOTAL	**30**				700	22

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   469

Course code	Course Title	Category	L	T	P	Credits
21UCSC11	**PROGRAMMING IN C**	**Core-1**	**5**	**-**	**-**	**4**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	I	25	75	100

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 introduce and form a firm foundation in programming
- To stress the importance of clarity , simplicity and the efficiency in writing programs
- To develop programming skills using the fundamentals and basics of C language
- To develop programs using the basic elements like control statements, Arrays and Strings

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	identify the basic concepts needed for program development	K1
CO 2	apply the basic concepts and develop program to find solutions for simple problems	K2,K3
CO 3	design programs to solve complex problems by using suitable control statements	K1,K3
CO 4	analyze the problem and design efficient program using functions	K1,K3
CO 5	use array and structure to handle volume of data	K2,K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLICATION

Passed in the BOS Meeting held on 18-03-2020

PROGRAMMING IN C

UNIT - I

C fundamentals Character set - Identifier and keywords - data types -constants - Variables - Declarations - Expressions - Statements - Arithmetic, Unary, Relational and logical, Assignment and Conditional Operators - Library functions.

UNIT - II

Data input output functions - Simple C programs - Flow of control - if, if-else, while, do-while, for loop, Nested control structures - Switch, break and continue, go to statements - Comma operator.

UNIT - III

Functions -Definition - proto-types - Passing arguments - Recursions. Storage Classes - Automatic, External, Static, Register Variables - Multi-file programs.

UNIT - IV

Arrays - Defining and Processing - Passing arrays to functions - Multi- dimension arrays - Arrays and String. Structures - User defined data types - Passing structures to functions - Self-referential structures - Unions - Bit wise operations.

UNIT - V

Pointers - Declarations - Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers - Files: Creating Processing, Opening and Closing a data file.

TEXT BOOK

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

REFERENCE BOOKS

1. B.W. Kernighan and D M. Ritchie, "The C Programming Language", 2nd Edition, PHI,1988.
2. H.Schildt,"C:TheCompleteReference",4thEdition.TMHEdition,2000.
3. Gottfried B.S, "Programming with C", Second Edition, TMH Pub. Co. Ltd., New Delhi1996.
4. KanetkarY.,"LetusC",BPBPub.,NewDelhi,1999.

ONLINE RESOURCES:

1. **http://www.kciti.edu/wp-content/uploads/2017/07/cprogramming_tutorial.pdf**
2. **https://www.skiet.org/downloads/cprogrammingquestion.pdf**
3. **https://phy.ntnu.edu.tw/~cchen/pdf/ctutor.pdf**

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	S					
CO2		M	L			M
CO3	M					
CO4	M		M	S		L
CO5	M	M	M	S	M	L

       S – STRONG   M – MEDIUM   L - LOW

COURSE DESIGNER: Dr. T.D.VENKATESWARAN

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   471

Course code	Course Title	Category	L	T	P	Credits
21UCSCP1	PRACTICAL : ' C' PROGRAMMING	Core-2	-	-	5	3

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	I	40	60	100

OBJECTIVES
- To train the students the basic concepts of the C-programming language
- To improve the programming skills through C language

Expression Evaluation
1. Finding Simple Interest and Compound Interest
2. Centigrade to Fahrenheit and Fahrenheit to Centigrade
3. Finding roots of a quadratic equation
4. Finding Standard Deviation and Variance

Conditional Statements
1. EB Bill Generation
2. Print Grade of a student
3. Checking Prime Number, Perfect Number, Armstrong Number, Adam Number
4. Sum of the digits of a number

Summation of Series
1. Sin(x), 2. Cos(x), 3. Exp(x) (Comparison with built in functions)

String Manipulation
1. Counting the number of vowels, consonants, words, white spaces in a line of text and array of lines.
2. Reverse a string and check for palindrome.
3. Sub string detection, count and removal.
4. Finding and replacing substrings.

Recursion
1. $^nP_r, ^nC_r$
2. GCD of two numbers
3. Fibonacci sequence
4. Maximum & Minimum

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   472

Matrix Manipulation

1. Addition and Subtraction
2. Multiplication
3. Transpose, and trace of a matrix
4. Determinant of a Matrix

Sorting and Searching

1. Insertion Sort
2. Bubble Sort
3. Linear Search
4. Binary Search

Functions

1. Finding Factorial
2. Finding NCP value using recursion
3. Finding biggest element

Structures

1. Mark Sheet Preparation using structure
2. Paybill Preparation using structure

Files

1. Inventory Control using files
2. Maintaining Book Information using files

COURSE DESIGNER: Dr. T.D.VENKATESWARAN

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   473

Course code	Course Title	Category	L	T	P	Credits
21UCSA11	**DISCRETE STRUCTURES**	**Allied-1**	**4**	**-**	**-**	**4**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	I	25	75	100

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 teach the basic concepts of Set theory and Relations
- To impart knowledge on solving problems using logic
- To solve various problems using matrices.
- To give the basic concepts of Graph theory and its applications

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	identify the basic concepts Set theory & Relations	K1
CO 2	give knowledge about Matrix Algebra	K2,K3
CO 3	inculcate the idea of Logics using Truth tables	K1,K3
CO 4	acquire knowledge about the basic concepts of Graph Theory and its applications	K1,K3
CO 5	use array and structure to handle volume of data	K2,K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLICATION

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22) 474

DISCRETE STRUCTURES

UNIT- I
Set Theory: Sets – Notation and Description of sets – Subsets – Venn-Euler diagram –Operations on sets – Properties on Set operations – Verification of the Basic Laws of Algebra by Venn diagrams – The Principle of Duality
Relations: Relations – Representation of a Relation – Operations on Relations –Equivalence Relation.
UNIT- II
Matrix Algebra: Introduction – Matrix operations – Inverse of a square matrix – Elementary operations and Rank of a Matrix – Simultaneous equations – Eigen values and Eigen vectors.
UNIT- III
Logic: Introduction – TF statements - Connectives – Atomic and Compound statements – Well formed Formulae - The Truth Table of a Formula – Tautological Implications and Equivalence of Formulae implication and equivalence of formulae.
UNIT- IV
Graph theory: **Introduction**: What is Graph? – Applications of Graphs – Finite and Infinite Graphs – Incidence and Degree – Isolated vertex, Pendant vertex, and Null Graph
Paths and Circuits: Isomorphism – Subgraphs –A puzzle with multicolored Cubes – Walks, Paths and Circuits – Connected Graphs, Disconnected graphs, Components
UNIT- V
Euler graphs – Operations on Graphs - Hamiltonian Paths and Circuits – Travelling Salesman Problem
Trees: Trees – Some properties of Trees – Pendant vertices in a tree – Distance and Centres in a tree – Spanning trees – Finding all spanning trees of a graph
TEXT BOOKS:
1. **Discrete Mathematics**, Dr. M.K. Venkataraman, Dr. N. Sridharan and Dr. N. Chandrasekaran, National Publishing Company, 2000. **(for Units I, II and III)**
2. **Graph Theory with Applications to Engineering and Computer Science,** Narsingh Deo, Prentice Hall of India Pvt. Ltd.,(**For units IV and V**)
REFERENCE BOOKS:
1. **Modern Algebra,** S. Arumugam & A. Thangapandi Issac, Scitech publications, 2005
ONLINE RESOURCES:
1. **https://www.coursera.org/specializations/discrete-mathematics**
2. **https://www.javatpoint.com/discrete-mathematics-tutorial**
3. **https://medium.com/basecs/a-gentle-introduction-to-graph-theory-77969829ead8**

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	S					
CO2		M	L			M
CO3	M					
CO4	M		M	S		L
CO5	M	M	M	S	M	L

S – STRONG   M – MEDIUM   L – LOW
COURSE DESIGNER: Dr. V.K.VIJAYAKUMAR

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22) 475

Course code	Course Title	Category	L	T	P	Credits
21UCSS11	**DIGITAL COMPUTER FUNDAMENTALS**	**SBS-1**	**2**	**-**	**-**	**2**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	I	25	75	100

COURSE DESCRIPTION:
The course enables the students to design Digital Circuits using basic logic gates and simplified Boolean functions and to understand concepts of sequential circuits and combinational circuits

COURSE OBJECTIVES:
- To give knowledge about basic number systems like Binary, Octal, Decimal, Hexadecimal number system
- To inculcate knowledge on basic logic gates and Boolean algebra
- To give knowledge on the physical internal components of computers like Multiplexers, Decoders, Encoders, Flipflops, Registers and Counters

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	describe the basics of Number Systems, Codes and logic gates	**K1**
CO 2	understand the concepts of Boolean Algebra and Karanaugh Maps.	**K1,K2**
CO 3	analyze the purpose and applications of Combinational and Sequential Logic	**K2,K3**
CO 4	discuss the various types of Combinational and Sequential Logic.	**K2,K3**
CO 5	explain the purpose, working principles and timing diagram of Registers and Counters.	**K2,K3**

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING,K3-APPLICATION

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   476

DIGITAL COMPUTER FUNDAMENTALS

UNIT- I

Binary number system-Binary to Decimal conversions-Decimal to Binary-Octal-Hexadecimal numbers-ASCII code-Excess-3 code-The basic gates- Inverter-OR Gates-AND Gates-Universal logic gates-NOR Gates-NAND Gates

UNIT- II

Boolean laws and theorems-Sum of Products Method-K map-Truth Tables-Pairs, Quads, Octets-K map simplifications-Don't care conditions-Product of sum methods-Product of sum simplifications.

UNIT- III

Multiplexers-De-Multiplexers-1-of-16-Decoders-BCD-to-Decimal   Decoders-   7-segment decoders-Encoders

UNIT- IV

Binary Addition-Binary Subtraction-2's & 1's complement representation-2'sComplement Arithmetic-Arithmetic building blocks-RS-flip flop-D-Flip Flop-JK Flip Flop

UNIT- V

Types of Registers-Serial in Serial out-Serial in Parallel out-Ripple Counter-Synchronous Counter.

TEXT BOOK:

Digital Principles and Applications by Albert Paul Malvino and Donald P. Leach
        Sixth Edition Tata McGraw-Hill-Edition
UNIT I: Chapters: 2.1 to 2.3, 5.1 to 5.7
UNIT II: Chapters: 3.1 to 3.8
UNIT III: Chapters: 4.1 to 4.6
UNIT IV: Chapters: 6.1 to 6.7, 8.1, 8.3, 8.4, 8.5
UNIT V: Chapters: 9.1 to 9.3, 10.1, 10.3

REFERENCE BOOKS:

1. Digital Computer Fundamentals, Thomas C. Bartee TMH 2007.
2. Digital Circuits and Design, S. Salivahanan and S. Arivazhagan ,Vikas Publishers.2005

ONLINE RESOURCES:

1. https://www.mheducation.co.in/digital-principles-and-applications-sie-9789339203405-india
2http://jnujprdistance.com/assets/lms/LMS%20JNU/B.Sc.(IT)/Sem%20I/Digital%20Computer% 20Fundamentals/Version%201/Digital%20Computer%20Fundamentals.pdf

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	S					
CO2		M	L			M
CO3	S					
CO4	M		M	S		L
CO5	M	M	M	S	M	L

    S – STRONG   **M – MEDIUM**   **L – LOW**

COURSE DESIGNER: Prof. K.P.GNANESH

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   477

II SEMESTER

S. No.	Sub. Code	Subject Title	Hrs / Week	Exam (Hrs.)	CA	SE	Total Marks	Cre
1	21UACT21/ H21/S21	Tamil/Hindi/ Sanskrit	6	3	25	75	100	3
2	21UACE21	English	6	3	25	75	100	3
3	21UCSC21	Core-3: Data Structures And Algorithms	5	3	24	75	100	5
4	21UCSCP2	Core-4: Practical II: Data Structures Using C	5	3	40	60	100	3
5	21UCSA21	Allied-2: Probability and Statistics	4	3	25	75	100	4
6	21UCSS21	SBS-2: Computer Organization & Architecture	2	3	25	75	100	2
7	21UACES1	Environmental Studies	2	3	25	75	100	2
		TOTAL	30				700	22

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   478

Course code	Course Title	Category	L	T	P	Credits
21UCSC21	**DATA STRUCTURES AND ALGORITHMS**	**Core-1**	**4**	**-**	**-**	**4**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	II	25	75	100

COURSE DESCRIPTION:

This course aims to impart fundamental knowledge on application of data structures in problem solving using several predefined algorithms.

COURSE OBJECTIVES:

- To impart knowledge and skill on identifying apt data structures to solve problems efficiently.
- To impart skill to write time and space efficient algorithms.
- To give knowledge on the concepts and applications of (i) linear data structures viz., arrays, stacks, queues (ii) linked linear data structures viz., linked lists, linked stacks and linked queues and (iii) Non-linear data structures viz.,trees, binary trees
- To give knowledge on various sorting and searching algorithms
- To impart knowledge on solving problems using algorithmic techniques viz., Divide and Conquer, Greedy Approach, Dynamic Programming and Backtracking

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	identify data structures needed to solve specific problems	K1
CO 2	analyze the data structures for effective use in problem solving	K2,K3
CO 3	design and develop efficient algorithms in terms of Space and Time	K3
CO 4	troubleshoot algorithms	K3
CO 5	analyze time complexity of algorithms	K2,K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING,K3-APPLICATION

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   479

DATA STRUCTURES AND ALGORITHMS

UNIT- I
Introduction of algorithms, analyzing algorithms, Arrays : Representation of Arrays, Implementation of Stacks and queues, Application of Stack: Evaluation of Expression - Infix to postfix Conversion - Multiple stacks and Queues, Sparse Matrices.

UNIT- II
Linked list : Singly Linked list - Linked stacks and queues - polynomial addition - More on linked Lists - Doubly linked List and Dynamic Storage Management - Garbage collection and compaction.

UNIT- III
Trees: Basic Terminology - Binary Trees - Binary Tree representations - Binary trees - Traversal - More on Binary Trees - Threaded Binary trees - counting Binary trees. Graphs: Terminology and Representations - Traversals, connected components and spanning Trees, Single Source Shortest path problem.

UNIT- IV
Symbol Tables : Static Tree Tables - Dynamic Tree Tables - Hash Tables : Hashing Functions - overflow Handling. External sorting : Storage Devices - sorting with Disks : K-way merging - sorting with tapes.

UNIT- V
Internal sorting : Insertion sort - Quick sort - 2 way Merge sort - Heap sort - shell sort - sorting on keys. Files: Files, Queries and sequential organizations - Index Techniques - File organization.

TEXT BOOKS:
1. Ellis Horowitz, Sartaj Shani, Data Structures, Galgotia publication.
2. Seymour Lipschutz, "DATA STRUCTURES," Schaum's Outlines, Tata McGraw Hill Publications.

REFERENCE BOOKS:
1. Data structures Using C Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J.Augenstein, Kindersley (India) Pvt.Ltd.,
2. Data structure and Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Pearson Education Pvt.Ltd.,

ONLINE RESOURCES:
1. https://www.computer-pdf.com/programming/781-tutorial-data-structure-and-algorithm-notes.html
2. https://www.cs.princeton.edu/courses/archive/spr11/cos217/lectures/08DsAlg.pdf
3. https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_DS_LECTURE_NOTES_2.pdf

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	S					
CO2		M	L			S
CO3	S					
CO4	M		M	S		L
CO5	M	M	S	S	M	L

S – STRONG   M – MEDIUM   L – LOW

COURSE DESIGNER: Dr. T.D.VENKATESWARAN

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   480

Course code	Course Title	Category	L	T	P	Credits
21UCSCP2	**PRACTICAL II: DATA STRUCTURES USING C**	**Core-4**	**5**	**-**	**-**	**3**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	II	40	60	100

1. Write a C program to create two array list of integers. Sort and store the elements of both of them in third list.

2. Write a C program to multiply two matrices A and B and store the resultant matrix in C using arrays.

3. Write a C program to experiment the operation of STACK using array.

4. Write a C program to create menu driven options to implement QUEUE to perform the following

    (i) Insertion (ii) Deletion (iii)Modification   (iv) Listing of elements

5. Write a C program to create Linked list representations of employee records and do the following operations using pointers.

    (i) To add a new record.

    (ii)To delete an existing record.

    (iii) To print the details about an employee.

    (iv) To find the number of employees in the structure.

6. Write a C Program to count the total nodes of the linked list.

7. Write a C program to insert an element at the end of the linked list.

8. Write a C program to insert an element at the beginning of a doubly linked list.

9. Write a C program to display the hashtable, using the mid square method.

10. Write a program to demonstrate Binary Search.

11. Write a C program to insert nodes into a Binary tree and to traverse in pre order.

12. Write a C program to traverse the given binary tree using all traversal methods.

13. Write a C program to arrange a set of numbers in ascending order using QUICKSORT.

 COURSE DESIGNER: Dr. T.D.VENKATESWARAN

 Passed in the BOS Meeting held on 18-03-2020

Course code	Course Title	Category	L	T	P	Credits
21UCSA21	**PROBABILITY & STATISTICS**	**Allied-2**	**4**	**-**	**-**	**4**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	II	25	75	100

COURSE DESCRIPTION

This course helps to provide the fundamental knowledge about Probability & Statistics

COURSE OBJECTIVES

- To give knowledge about various types of statistical measures such as mean, median, mode, geometric mean, harmonic mean, standard deviation etc.,
- To give a foundation in statistical data analysis
- To solve real life problems using Correlation coefficient, regression, and theoretical probability distributions.

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	identify the basic concepts Central tendencies	K1
CO 2	acquire knowledge about Measures of Dispersion	K2,K3
CO 3	inculcate the idea of Curve Fitting, Correlation & Regression	K1,K3
CO 4	gain knowledge about the basic concepts of Probability & Random variables	K1,K3
CO 5	gain knowledge about theoretical Discrete & Continuous distributions	K2,K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING,K3-APPLICATION

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22) 482

PROBABILITY & STATISTICS

UNIT –I
CENTRAL TENDENCIES: Introduction –Arithmetic Mean (AM) – Partition values (Median, Quartiles, Deciles and Percentiles) – Geometric Mean and Harmonic Mean – Relative advantages of different averages.

UNIT – II
MEASURES OF DISPERSION: Introduction – Measures of Dispersion - Measures of dispersion – Range – Quartile Deviation – Mean Deviation – Standard deviation and Root mean square deviation – Coefficient of dispersion - Coefficient of variation – relative advantages of different measures of dispersion - Moments – Skewness – Kurtosis

UNIT – III
CURVE FITTING: Introduction – Principle of Least squares - Fitting of a straight line - Fitting of second degree parabola. **CORRELATION AND REGRESSION:** Introduction – Correlation - Karl Pearson coefficient of correlation – Rank Correlation – Repeated ranks – Regression – Lines of regression

UNIT – IV
PROBABILITY: Introduction - Probability – Conditional Probability - Example Problems only.
RANDOM VARIABLES: Introduction - Random Variables – Discrete Random variable - Continuous random variable – Mathematical Expectations – Solved Problems only.

UNIT –V
SOME SPECIAL DISTRIBUTIONS: Introduction - Binomial distribution – Moments of Binomial distribution – MGF of Binomial distributions - Poisson distribution – MGF of Poisson distributions - Moments of Poisson distribution - Normal distribution – Moments of Normal distribution - MGF of Normal distributions.
(**Excluding the Topics**: Median, Mode, Cumulants, Recurrence formula, Fitting distributions, Characteristic functions, Additive Property)
(**Units I, II, III, IV,V: Problems** – Solved Problems only, **Theorems**- Statements only)

TEXT BOOK:

STATISTICS, By "**Dr.S.ARUMUGAM & A.THANGAPANDI ISSAC**", NEW GAMMA PUBLISHING HOUSE, 2002
Unit I : 2.0 – 2.5 : Pages: 11-59   Unit II : 3.0-3.2, 4.0-4.2 : Pages: 60-94
Unit III: 5.0, 5.1, 6.0, 6.1, 6.2, 6.3 : Pages :95-141
Unit IV: 11.0, 11.1 , 11.2, 12.0, 12.1, 12.2, 12.3, 12.4 : Pages: 274-300, 304-328
Unit V: 13.0, 13.1, 13.2, 13.3

REFERENCE BOOKS:
1. **FUNDAMENTALS OF MATHEMATICAL STATISTICS** by **S.C.GUPT & V.K.KAPOOR,** SULTAN CHAND AND SONS, 2004.
2. **ELEMENTS OF MATHEMATICAL STATISTICS** by **S.C.GUPTA** & **V.K.KAPOOR**, SULTAN CHAND & SONS, THIRD EDITION, 2000

Passed in the BOS Meeting held on 18-03-2020

ONLINE RESOURCES:

1. http://math.iisc.ernet.in/~manju/UGstatprob16/statprob.pdf
2. http://wwwf.imperial.ac.uk/~ejm/ISE.2.6/NOTES.PDF

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	S					
CO2		M	L			M
CO3	M					
CO4	M		M	S		L
CO5	M	M	M	S	M	L

   S – STRONG   **M – MEDIUM**   **L - LOW**

COURSE DESIGNER: Dr. V.K.VIJAYAKUMAR

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   484

Course code	Course Title	Category	L	T	P	Credits
21UCSS21	**SBS-2: COMPUTER ORGANIZATION & ARCHITECTURE**	**SBS-2**	**2**	**-**	**-**	**2**

L – Lecture   T – Tutorial   P – Practical

Year	Semester	Internal	External	Total
I	II	25	75	100

COURSE DESCRIPTION:

This course helps to gain the knowledge and understands hardware components of a computer and impart knowledge about internal architecture of a computer system and the techniques used to connect various input/output system with the computer.

COURSE OBJECTIVES:

- To enrich the knowledge on hardware components of a computer
- To have knowledge on Instruction formats and Addressing modes
- To inculcate knowledge on working concepts of Input/output devices.
- To give knowledge on various types of memory and their hierarchies.

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	acquire knowledge on registers, instructions , timing and control	K1
CO 2	understand and explain various types of instruction format, addressing modes, data transfer and manipulation instruction and apply the basic concepts to develop assembler program	K2,K3
CO 3	identify the memory requirement of a CPU and understands the working principles of parallel processing and pipeline processing	K1,K2
CO 4	gain knowledge on usage of I/O interfaces and various types of data transfers	K1, K2
CO 5	understand various types of memory and its organizations	K1

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLICATION

Passed in the BOS Meeting held on 18-03-2020

SOURASHTRA COLLEGE, MADURAI– 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
B.Sc. COMPUTER SCIENCE - SYLLABUS (Under CBCS based on OBE)
(with effect from 2021-22)   485

COMPUTER ORGANIZATION & ARCHITECTURE

Unit -I

Instruction Codes _ Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle.

Unit -II

General Register Organization – Stack Organization – Instruction Formats – Addressing Modes.

Unit -III

Parallel processing – Pipelining –Arithmetic Pipeline - Instruction Pipeline-Vector processing-Vector operation-memory interleaving- Super Computer.

Unit- IV

I/O Interface – Asynchronous Data Transfer- Modes of I/O transfer - Direct Memory Access.

Unit- V

Memory Hierarchy – Main Memory - Auxillary Memory – Associative Memory – Cache Memory – Virtual Memory.

TEXT BOOK:

Computer System Architecture – M. Morris Mano 3rd Edition

Unit I	Chapters:	5.1 - 5.5
Unit II	Chapters:	8.1 - 8.5
Unit III	Chapters:	9.1 - 9.4, 9.6
Unit IV	Chapters:	11.2 - 11.4, 11.6
Unit V	Chapters:	12.1 - 12.6

REFERENCE BOOKS:

Computer Organization V. Carl Hamacher, Zconko G. Vranesic, Safwat G. Zaky 4th Edition, McGraw-Hill International Editions.

ONLINE RESOURCES:

1 https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials

2. https://nptel.ac.in/courses/106105163/

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	S		L			
CO2		M	L			M
CO3	M	M			L	
CO4			M	S		L
CO5	M			S	L	L

S – STRONG   M – MEDIUM   L - LOW

COURSE DESIGNER: D.V.JEYANTHI

Passed in the BOS Meeting held on 18-03-2020