



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

510

DEPARTMENT PROFILE

The Bachelor of Computer Applications (BCA) was established in the year 2010 with Computer Applications 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 350 (7 batches) Computer Science graduates and they are all well placed in various industries in India & abroad. The Department has been producing excellent results over a period of 7 years. The Department has adequate infrastructure with a well equipped Computer Laboratory with LCD projectors, a well stacked Department Library, and well furnished class rooms.

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 up-gradation of curriculum.

Signature of the Chairman/HOD



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

511

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	4	5	20
III	V,VI	ELECTIVE	3	5	5	15
IV	I-VI	SKILL BASED SUBJECT(SBS)	6	3	2	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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

512

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of Bachelor of Computer Applications Programme (BCA), the students are expected to

PSO 1	develop into 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 the ability for work efficacy as a part of a team and engage effectively with diverse stakeholders
PSO 6	to embark on new ventures and initiatives with critical thinking and desire for more continuous learning focusing on life skills.



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

513

BACHELOR OF COMPUTER APPLICATIONS - 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 – I	6	3	100	3
3	21UCAC11	Core: Programming in C	5	3	100	4
4	21UCACP1	Core: Lab I: C Programming	5	3	100	4
5	21UCAAA11	Discrete Mathematics (Allied -1)	4	3	100	4
6	21UCAS11	Digital Computer Fundamentals (SBS-1)	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 –II	6	3	100	3
3	21UCAC21	Core: Data Structures & Algorithms	5	3	100	4
4	21UCACP2	Core: Lab II : Data Structure using C	5	3	100	4
5	21UCAAA21	Computer Based Financial Accounting (Allied-2)	4	3	100	4
6	21UCAS21	Computer Organization & Architecture (SBS-2)	2	3	100	2
7	21UACES1	Environmental Studies	2	3	100	2
		TOTAL	30		700	22



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

514

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 –III	6	3	100	3
3		Core: Object Oriented Programming using C++	5	3	100	4
4		Core: Lab III: Object Oriented Programming using C++	5	3	100	4
5		Resource Management Technique (Allied-3)	4	3	100	4
6		Lab : Office Automation (SBS-3)	2	3	100	2
7		Introduction to Information Technology (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 –IV	6	3	100	3
3		Core: Programming in Java	5	3	100	4
4		Core: Lab IV: Java Programming	5	3	100	4
5		Numerical Methods (Allied - 4)	4	3	100	4
6		Lab : Multimedia (SBS-4)	2	3	100	2
7		Web Programming (NME-2)	2	3	100	2
		Extension Activity			100	1
		TOTAL	30		700	23

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.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

515

V SEMESTER

S. No	Sub. Code	Subject Title	Hrs./ Week	Exam (Hrs.)	Total Marks	Credits
1		Core: Operating System	6	3	100	4
2		Core: Relational Database Management System	6	3	100	4
3		Core: Lab V : Web Technology	5	3	100	4
4		Core: Computer Networks	5	3	100	4
5		Web Technology (Elective – I)	4	3	100	5
6		Quantitative Aptitude (SBS-5)	2	3	100	2
7		Lab : PL/SQL (SBS-6)	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		Programming in Python	5	3	100	4
2		Core: Lab VI : Python Programming	5	3	100	4
3		Core: Software Engineering	5	3	100	4
4		Lab VII : Open Source Technology	5	3	100	4
5		Principles of Information Security (Elective – II)	5	3	100	5
6		Project Work & Viva-Voce (Elective – III)	5	3	100	5
7		G.K.	-	-	100	-
		TOTAL	30		700	26



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

516

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 – I	6	3	25	75	100	3
3	21UCAC11	Programming in C	5	3	25	75	100	4
4	21UCACP1	Lab I: C Programming	5	3	40	60	100	4
5	21UCAA11	Discrete Mathematics (Allied -1)	4	3	25	75	100	4
6	21UCAS11	Digital Computer Fundamentals (SBS-1)	2	3	25	75	100	2
7	21UACVE1	Value Education	2	3	25	75	100	2
		TOTAL	30				700	22



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

517

Course code	Course Title	Category	L	T	P	Credits
21UCAC11	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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

518

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 Delhi 1996.
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: Prof. O.K.HARIHARAN

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.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

519

Course code	Course Title	Category	L	T	P	Credits
21UCACPI	LAB I: C PROGRAMMING	Core-2	-	-	5	4

L – Lecture

T – Tutorial

P – Practical

Year	Semester	Internal	External	Total
I	I	40	60	100

COURSE OBJECTIVES:

- It aims to train the student to 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. ${}^nPr, {}^nC_r$
2. GCD of two numbers
3. Fibonacci sequence
4. Maximum & Minimum

Matrix Manipulation

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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

520

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. Pay bill Preparation using structure

Files

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

COURSE DESIGNER: Prof. O.K.HARIHARAN



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

521

Course code	Course Title	Category	L	T	P	Credits
21UCAA11	DISCRETE MATHEMATICS	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	gain knowledge about Matrix Algebra	K2,K3
CO 3	inculcate the idea of Logics using Truth tables	K1,K3
CO 4	gain knowledge about the basic concepts of Graph Theory and its applications	K1,K3
CO 5	array and structure to handle volume of data	K2,K3

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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

522

DISCRETE MATHEMATICS

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 – Sub graphs –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: Prof. V.B.SHAKILA

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.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

523

Course code	Course Title	Category	L	T	P	Credits
21UCAS11	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 Karnaugh 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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

524

DIGITAL COMPUTER FUNDAMENTALS

UNIT- I

Binary number system-Binary to Decimal conversions-Decimal to Binary-Octal-Hexadecimal numbers-ASCII code-Excess-3 code-Gray 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-Exclusive-OR Gates-Parity Generators-Checkers

UNIT- IV

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

UNIT- V

Types of Registers-Serial in Serial out-Serial in Parallel out-Parallel in Serial out-Parallel 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 5.8

UNIT II : Chapters: 3.1 to 3.8

UNIT III: Chapters: 4.1 to 4.8

UNIT IV: Chapters: 6.1 to 6.8, 8.1, 8.3, 8.4, 8.5, 8.7

UNIT V : Chapters: 9.1 to 9.5, 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>
2. [http://jnujprdistance.com/assets/lms/LMS%20JNU/B.Sc.\(IT\)/Sem%20I/Digital%20Computer%20Fundamentals/Version%201/Digital%20Computer%20Fundamentals.pdf](http://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. T.L.MEENALOCHANI

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.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

525

II SEMESTER

S. No	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	21UACT21/ H21/S21	Tamil/Hindi/Sanskrit	6	3	25	75	100	3
2	21UACE21	English –II	6	3	25	75	100	3
3	21UCAC21	Data Structures & Algorithms	5	3	25	75	100	4
4	21UCACP2	Lab II : Data Structure using C	5	3	40	60	100	4
5	21UCAA21	Computer Based Financial Accounting (Allied-2)	4	3	25	75	100	4
6	21UCAS21	Computer Organization & Architecture (SBS-2)	2	3	25	75	100	2
7	21UACES1	Environmental Studies	2	3	25	75	100	2
		TOTAL	30				700	22



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

526

Course code	Course Title	Category	L	T	P	Credits
21UCAC21	DATA STRUCTURES AND ALGORITHMS	Core-3	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 about File organisation

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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

527

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 BOOK:

1. Ellis Horowitz, Sartaj Shani, Data Structures, Galgotia publication.

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_NOTES2.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: Prof. T.L.MEENALOCHANI

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.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

528

Course code	Course Title	Category	L	T	P	Credits
21UCACP2	LAB II: DATA STRUCTURES USING C	Core-4	5	-	-	4

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 hash table, 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: Prof. T.R.SIVASANKARI

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.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

529

Course code	Course Title	Category	L	T	P	Credits
21UCAA21	COMPUTER BASED FINANCIAL ACCOUNTING	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 the student to learn the basic concept of accounting and maintaining the records of accounts.

COURSE OBJECTIVES:

It helps the student to prepare various books of accounts and finalization of accounts of individual.

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	understand the basic concept and conventions of accounting principles	K1,K2
CO 2	maintain the various subsidiary books and its purpose	K2,K3
CO 3	understand and preparing the final accounts and its purpose	K3
CO 4	ascertain the various ratio using various accounting statement	K3
CO 5	understand the tally software and its implementation	K2,K3

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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

530

COMPUTER BASED FINANCIAL ACCOUNTING

UNIT-I

Accounting –Principles, Convention-Journal-ledger- Trial Balance.

UNIT-II

Preparation of Subsidiary Books : sales book - purchase book - purchase return book – sales return book – bills receivable book – bills payable book – cash book.

UNIT-III

Preparation of Trading, Profit and Loss Accounts, Balance Sheet of Individual only.

UNIT-IV

Accounting Ratios: return on investment - Net profit ratio - gross profit ratio – expense ratio - operating profit ratio – proprietary ratio - debt equity ratio – fixed assets ratio – current ratio – liquidity ratio.

UNIT-V

Financial Accounting Package (tally 6.3): Accounts masters-Vouchers entry – Reports printing – Tally Review (features)

TEXT BOOKS:

1. Advanced Accountancy: R.L. Gupta & RadhaSwamy, Sulthanchand Publishers 2004 (Unit 1 to 3)
2. Management Accounting by Dr. Peer Mohamed, Dr. Shazuli Ibrahim, Pass Publications (Unit 4)
3. “Implementing Tally 9” Comprehensive guide for Tally 9 & 8.1 by Nadhani

Allotment of marks for External Examination

Note : Theory 50%
Problems 50%

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit I & II (Text Book 1) : Page 1.2.1 to 1.2.16 , 1.6.1 to 1.6.34 ;

Unit III (Text Book 1)Page 1.7.1 to 1.7.39;

Unit – IV (Text Book 2) Page 3.01 to 3.23 ;

Unit-V (Text Book 3) – Page 2-4.1 to 2-4.82. and 2-5.1 to 2-5.11 and 2-15.1 to 2-15.2

COURSE DESIGNER: Prof. O.K.HARIHARAN



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

531

Course code	Course Title	Category	L	T	P	Credits
21UCAS21	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 and understands the working principles of parallel processing and pipeline processing	K1,K2
CO 4	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



SOURASHTRA COLLEGE, MADURAI- 625004

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

B.C.A. - SYLLABUS (Under CBCS based on OBE)

(with effect from 2021-22)

532

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 and 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 - Auxiliary 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:

- <https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials>
- <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: Prof. T.L.MEENALOCHANI

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