



# **SOURASHTRA COLLEGE, MADURAI – 625004**

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

## **B.Sc. INFORMATION TECHNOLOGY – SYLLABUS**

(Under CBCS based on OBE)(For those admitted during 2024 – 2025 and after)

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### **ABOUT THE DEPARTMENT**

The Department of Information Technology was started in the year 2000. Since then, the Department has been functioning successfully producing young Graduates every year, with well trained and experience faculty members and supporting staff. So far, the Department has produced more than 1000 (20 Batches) Information Technology graduates and they are all well placed in many leading IT Industries. The Department has been producing excellent results over a period of 20 Years. We have adequate infrastructure with well equipped Computer Laboratory, a well stacked Department Library, well-furnished Class Rooms and a separate LCD Projector in the Computer Lab.

### **VISION**

To produce distinguished graduates trained in the latest tools and technologies and to create excellent professionals in the field of Information Technology.

### **MISSION**

- To provide excellent undergraduate education with advanced technical skills, preparing students as internationally recognised computer professionals in various domains.
- To provide quality education in correlation with industry needs.
- To advance the quality educational experiences by improving our position recognized nationally and internationally.
- To support with extended technical training activities preparing our students for lifelong learning and professional growth.



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### **GRADUATE ATTRIBUTES**

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



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### PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

#### **B.Sc. INFORMATION TECHNOLOGY**

<b>PEO 1</b>	To prepare the students as successful professionals in IT Industry, Government sectors, Academia and Consultancy firms.
<b>PEO 2</b>	To make the students continuously acquire knowledge, theoretical and applied related in core areas of Information Technology and applied them in all fields.
<b>PEO 3</b>	To motivate the students with the ability to gain multidisciplinary knowledge through real time projects and internship training to meet industry need.
<b>PEO 4</b>	To give the students a substantial understanding in the key area of Information Technology.
<b>PEO 5</b>	To train the students to collaborate in diverse team environment to make positive contribution in the IT field.
<b>PEO 6</b>	To engage the students in life– long learning, to remain current in their profession and obtain additional qualifications, to enhance their career positions in IT industries.

### 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.

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



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### PROGRAMME SPECIFIC OUTCOMES (PSOs)

#### BACHELOR OF INFORMATION TECHNOLOGY (B.Sc. (I.T)) PROGRAMME

<b>PSO 1</b>	To transform and empower students to meet global challenges through holistic education in terms of recent Teaching– Learning methodologies
<b>PSO 2</b>	To groom the students towards excellence through building communication skills, handling leadership challenges and negotiating career path ways
<b>PSO 3</b>	To heighten the conscious of the students on socio– economic concern and to inculcate moral and ethical values to chisel them as better human being
<b>PSO 4</b>	To train the students on the state– of– the– art tools and techniques and facilitate them to comprehend, analyze, design and create feasible solutions/innovative products for real life problems
<b>PSO 5</b>	To motivate them to pursue higher studies with good knowledge in core areas of Information Technology, by becoming aware of modern tools, techniques and good interpersonal skills
<b>PSO 6</b>	To help the students use and apply current technical concepts and practices in the core Information Technologies of human computer interaction, information management, programming and networking.

### 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	16	5– 6	4	64
III	I– IV	ALLIED	4	4	4	16
III	V– VI	ELECTIVE	3	5	5	15
IV	I – IV	SKILL BASED SUBJECT	6	2	2	12
IV	I	VALUE EDUCATION	1	2	2	2
IV	I	ENVIRONMENTAL STUDIES	1	2	2	2
IV	III, IV	NON MAJOR ELECTIVE	2	2	2	4
V	IV	EXTENSION ACTIVITY	1	0	1	1
	V	SELF – STUDY (SOFT SKILLS)	1	0	0	0
	VI	SELF –STUDY (G.K. (ONLINE))	1	0	0	0
<b>TOTAL</b>						<b>140</b>
<b>Any online courses in SWAYAM PORTAL</b>						



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### B.Sc. INFORMATION TECHNOLOGY – COURSE STRUCTURE

#### SEMESTER – I

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	24UACT11	<b>Part – I: Tamil –</b> பொதுத் தமிழ் – I	6	3	25	75	100	3
	24UACH11	<b>Hindi –</b> General Hindi – I						
	24UACS11	<b>Sanskrit –</b> Poetry, Grammar and History of Sanskrit Literature						
2.	24UACE11	<b>Part – II: English –</b> General English – I	6	3	25	75	100	3
3.	24UITC11	<b>Part – III: Core – 1:</b> Programming in C	5	3	25	75	100	4
4.	24UITCP1	<b>Part – III: Core – 2:</b> Lab : Programming in C	5	3	40	60	100	4
5.	24UITA11	<b>Part – III: Allied – 1:</b> Discrete Mathematics	4	3	25	75	100	4
6.	24UITS11	<b>Part – IV: SBS – 1:</b> Digital Computer Fundamentals	2	3	25	75	100	2
7.	24UACVE1	<b>Part – IV: Value Education</b>	2	3	25	75	100	2
		<b>TOTAL</b>	<b>30</b>				<b>700</b>	<b>22</b>

#### SEMESTER – II

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	24UACT21	<b>Part – I: Tamil –</b> பொதுத் தமிழ் – II	6	3	25	75	100	3
	24UACH21	<b>Hindi –</b> General Hindi – II						
	24UACS21	<b>Sanskrit –</b> Prose, Grammar and History of Sanskrit Literature						
2.	24UACE21	<b>Part – II: English –</b> General English – II	6	3	25	75	100	3
3.	24UITC21	<b>Part – III: Core – 3:</b> Object Oriented Programming in C++	5	3	25	75	100	4
4.	24UITCP2	<b>Part – III: Core – 4:</b> Lab : Object Oriented Programming in C++	5	3	40	60	100	4
5.	24UITA21	<b>Part – III: Allied – 2:</b> Statistics	4	3	25	75	100	4
6.	24UITS21	<b>Part – IV: SBS – 2:</b> Computer Organization and Architecture	2	3	25	75	100	2
7.	24UACES1	<b>Part – IV:</b> Environmental Studies	2	3	25	75	100	2
		<b>TOTAL</b>	<b>30</b>				<b>700</b>	<b>22</b>

Passed in the BoS Meeting held on 09/03/2024

Signature of the Chairman



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### SEMESTER – III

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.		<b>Part – I: Tamil –</b> காப்பியமும் நாடகமும்	6	3	25	75	100	3
		<b>Hindi – Hindi – III</b>						
		<b>Sanskrit – Sanskrit – III</b>						
2.		<b>Part – II: English –</b> English For Enrichment – III	6	3	25	75	100	3
3.		<b>Part – III: Core – 5:</b> Java Programming	5	3	25	75	100	4
4.		<b>Part – III: Core – 6:</b> <b>Lab :</b> Java Programming	5	3	25	75	100	4
5.		<b>Part – III: Allied – 3:</b> Operation Research	4	3	25	75	100	4
6.		<b>Part – IV: SBS – 3:</b> <b>Lab :</b> Office Automation	2	3	40	60	100	2
7.		<b>Part – IV: NME – 1:</b> Introduction to Information System	2	3	25	75	100	2
<b>TOTAL</b>			<b>30</b>				<b>700</b>	<b>22</b>

### SEMESTER – IV

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.		<b>Part – I: Tamil –</b> சங்க இலக்கியமும் அற இலக்கியமும்	6	3	25	75	100	3
		<b>Hindi – Hindi – IV</b>						
		<b>Sanskrit – Sanskrit – IV</b>						
2.		<b>Part – II: English –</b> English For Enrichment – IV	6	3	25	75	100	3
3.		<b>Part – III: Core – 7:</b> Fundamental of Data Structures	5	3	25	75	100	4
4.		<b>Part – III: Core – 8:</b> <b>Lab :</b> Data Structures Using C	5	3	40	60	100	4
5.		<b>Part – III: Allied – 4:</b> Numerical Methods	4	3	25	75	100	4
6.		<b>Part – IV: SBS – 4:</b> <b>Lab :</b> Multimedia	2	3	40	60	100	2
7.		<b>Part – IV: NME – 2:</b> Introduction to MS Office	2	3	25	75	100	2
8.		<b>Part – V:</b> Extension Activities	–	–	–	–	100	1
<b>TOTAL</b>							<b>800</b>	<b>23</b>

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### SEMESTER – V

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.		<b>Part – III: Core – 9:</b> Operating System Concepts	6	3	25	75	100	4
2.		<b>Part – III: Core – 10:</b> TCP/IP	5	3	25	75	100	4
3.		<b>Part – III: Core – 11:</b> Python Programming	5	3	25	75	100	4
4.		<b>Part – III: Core – 12:</b> <b>Lab :</b> Python Programming	5	3	40	60	100	4
5.		<b>Part – III: Elective – 1:</b>	5	3	25	75	100	5
		Big Data Fundamentals	5	3	25	75	100	
		Mobile Computing	5	3	25	75	100	
		BioMetrics	2	3	40	60	100	2
6.		<b>Part – IV: SBS – 5:</b> <b>Lab :</b> Dot Net	2	3	40	60	100	2
7.		<b>Part – IV: SBS – 6:</b> <b>Lab :</b> OS (Linux)					100	
8.		Soft Skills (Self-Study)	–	–	–	–	100	–
		<b>TOTAL</b>	<b>30</b>				<b>800</b>	<b>25</b>

\*One elective course to be chosen from THREE courses

### SEMESTER – VI

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.		<b>Part – III: Core – 13:</b> Software Engineering	5	3	25	75	100	4
2.		<b>Part – III: Core –14:</b> Relational Database Management System	5	3	25	75	100	4
3.		<b>Part – III: Core – 15:</b> <b>Lab :</b> Oracle	5	3	40	60	100	4
4.		<b>Part – III: Core – 16:</b> <b>Lab :</b> HTML &PHP	5	3	40	60	100	4
5.		<b>Part – III: Elective – 2:</b>						
		Principles of Information Security	5	3	25	75	100	5
		Software Testing						
		Ethical Hacking						
6.		<b>Part – III : Elective-3:</b> Project and Viva Voce	5	3	40	60	100	5
7.		General Knowledge (Self-Study)	–	–	–	–	100	–
		<b>TOTAL</b>	<b>30</b>				<b>700</b>	<b>26</b>

\*One elective course to be chosen from THREE courses

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### COURSE STRUCTURE – I SEMESTER

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	24UACT11	<b>Part – I: Tamil –</b> பொதுத் தமிழ் – I	6	3	25	75	100	3
	24UACH11	<b>Hindi –</b> General Hindi – I						
	24UACS11	<b>Sanskrit –</b> Poetry, Grammar and History of Sanskrit Literature						
2.	24UACE11	<b>Part – II: English –</b> General English – I	6	3	25	75	100	3
3.	24UITC11	<b>Part – III: Core – 1:</b> Programming in C	5	3	25	75	100	4
4.	24UITCP1	<b>Part – III: Core – 2:</b> <b>Lab :</b> Programming in C	5	3	40	60	100	4
5.	24UITA11	<b>Part – III: Allied – 1:</b> Discrete Mathematics	4	3	25	75	100	4
6.	24UITS11	<b>Part – IV: SBS – 1:</b> Digital Computer Fundamentals	2	3	25	75	100	2
7.	24UACVE1	<b>Part – IV:</b> Value Education	2	3	25	75	100	2
		<b>TOTAL</b>	<b>30</b>				<b>700</b>	<b>22</b>

**CA** – Class Assessment (Internal)

**SE** – Summative Examination

**SBS** – Skill Based Subject

**NME** – Non –Major Elective

**T** – Theory

**P** – Practical





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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITC11	PROGRAMMING IN C	CORE – 1	5	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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### 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 C
- To stress the importance of clarity , simplicity and the efficiency in writing programs

### COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	apply the basic concepts and develop program to find solutions for simple problems	Upto K3
CO 2	design programs to solve complex problems by using suitable control statements	Upto K3
CO 3	analyze the problems and design efficient program using functions	Upto K3
CO 4	use array and structure to handle volume of data	Upto K3
CO 5	use advanced data structures Pointers and files for data processing	Upto K3

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



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### **PROGRAMMING IN C**

#### **UNIT – I:**

Introduction to Algorithms and Flowchart – Feature of algorithm – Symbols in a Flowchart – Basic Structure of C Program – Constants, Variables and Data types : Character set – C tokens – Keywords and Identifiers – Constants – Variables – Data types – Declaration of variables and storage class – Assigning values to variables – Defining Symbolic Constants – Declaring variable as constants.

#### **UNIT – II:**

Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special operators – Arithmetic Expression – Evaluation of Expressions – Operator Precedence and Associativity.

Managing Input and Output Operations: Reading and Writing a character – Formatted input and output.

#### **UNIT – III:**

Decision making and Branching: If statement– simple If –If – Else – Nested If – Else – Else If Ladder – Switch statement – Conditional: Operator– Go To Statement.

Decision making and Looping: WHILE statement – DO Statement – FOR statement.

Arrays: One – Dimensional Arrays – Declaration of One – Dimensional arrays – Initialization of One – Dimensional arrays – Two Dimensional arrays – Initializing Two Dimensional Arrays – Multi Dimensional arrays.

#### **UNIT – IV:**

Character arrays and Strings: Declaring and Initializing String Variables – Reading Strings – Writing Strings – Arithmetic operations on characters – putting strings together – Comparison of Two strings – String Handling functions.

User Defined Functions: Definition of Functions – Return values and their types– Function calls– Function Declaration – Category of Function – Recursion.

#### **UNIT – V:**

Structures and Unions: Defining a structure – Declaring Structure variables – Accessing structure members – Arrays of structures– Arrays within structures – Unions. File Management: Defining and Opening a File – Closing a File – I/O operations on Files.



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### TEXT BOOKS:

*Programming in ANSI C* – E. Balagurusamy – Sixth Edition – Tata McGraw Hill

**Unit – I:** Chapter 1 – 1.8, Chapter 2 – 2.2 to 2.12

**Unit– II:** Chapter 3: 3.1 to 3.11 & 3.15, Chapter 4: 4.2 to 4.5

**Unit– III:** Chapter 5: 5.2 to 5.9, Chapter 6:6.2 to 6.4, Chapter 7:7.1 to 7.7

**Unit– IV:** Chapter 8: 8.2 to 8.8, Chapter 9: 9.5 to 9.14 & 9.16.

**Unit– V:** Chapter 10:10.2 to 10.4, 10.8, 10.9, 10.12, Chapter 12: 12.2 to 12.4

### REFERENCE BOOKS:

1. *Programming in C* – Radha Ganeshan– Scitech Publication
2. *Programming with C* – Smarajith Gohsh – Phi Publication

### DIGITAL TOOLS:

1. <https://www.toppr.com/guides/computer-science/programming-methodology/problem-solving-methodologies/introduction-to-algorithms-and-flowcharts/#Terminal>
2. [http://www.kciti.edu/wp-content/uploads/2017/07/cprogramming\\_tutorial.pdf](http://www.kciti.edu/wp-content/uploads/2017/07/cprogramming_tutorial.pdf)
3. <https://www.skiet.org/downloads/cprogrammingquestion.pdf>
4. <https://phy.ntnu.edu.tw/~cchen/pdf/ctutor.pdf>

### Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. R. P. UMADEVI



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITCP1	LAB: PROGRAMMING IN C	CORE – 2 LAB	–	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### COURSE DESCRIPTION:

This course is to develop student's practical knowledge to write coding using object oriented programming code and implement in various applications.

### 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

### COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand basic C program.	Upto K3
CO 2	design various programs using if, if..else, for, while , do..while, switch..case.	Upto K3
CO 3	execute programs using Arrays and strings.	Upto K3
CO 4	execute programs using Structures and Functions	Upto K3
CO 5	execute programs using Files	Upto K3

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



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### **LAB: PROGRAMMING IN C**

#### **SIMPLE PROGRAMS:**

1. Write a C Program for Addition of Two numbers
2. Write a C Program for Swapping Two numbers.
3. Write a C Program to find Simple Interest and Compound Interest.

#### **CONTROL STATEMENTS ( if , if – else , if .. else .. else if)**

4. Write a C Program to find the Biggest of Three Numbers.
5. Write a C Program to Check the given number is Positive , Negative and Zero.
6. Write a C Program to Check the given number is ODD or EVEN.
7. Write a C Program to Calculate the Sales and Commission.
8. Write a C Program to Calculate EB– Bill .

#### **LOOPING STATEMENT (for , While , do– while ,Switch..Case)**

9. Write a C Program to find the Factorial of a given Limit.
10. Write a C Program to Generate Fibonacci Series.
11. Write a C Program to Generate Multiplication Table.
12. Write a C Program to Check the given number is ADAM or NOT.
13. Write a C Program to Check the given number is ARMSTRONG or NOT.
14. Write a C Program to find the Sum of Digits , Sum of Series , Reverse the number using Switch Case.

#### **ARRAYS AND STRINGS:**

15. Write a C Program for Addition of Two Matrices.
16. Write a C Program for Transpose of Matrices.
17. Write a C Program for Multiplication of Two Matrices.
18. Write a C Program for Ascending Order.
19. Write a C Program for Searching Number
20. Write a C Program for Counting Vowels in a given String.
21. Write a C Program for arranging the Names in Ascending Order

#### **STRUCTURES AND FUNCTION:**

22. Write a C Program for swapping two number using call by value and call by references.
23. Write a C Program for Calculating Marks of a student using Structure

#### **FILES:**

24. Write a C Program for Writing a Employee Salary in a File
25. Write a C Program for Reading a Employee Salary as a Process File

**COURSE DESIGNER: Prof. R. P. UMADEVI**



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITA11	DISCRETE MATHEMATICS	ALLIED – 1	4	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### 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 Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	identify the basic concepts of Set theory & Relations	Upto K3
CO 2	receive knowledge about mathematical induction and recurrence relation	Upto K3
CO 3	understand the idea of Matrix Algebra	Upto K3
CO 4	gain knowledge about the basic concepts of Graph Theory and its applications	Upto K3
CO 5	acquire knowledge about Logics using Truth Table	Upto K3

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



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### DISCRETE MATHEMATICS

#### UNIT – I: SET THEORY AND RELATION

**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: Cartesian Product of Two Sets** – Relations – Representation of a Relation – Operations on Relations –Equivalence Relation.

#### UNIT – II: MATHEMATICAL INDUCTION AND RECURRENCE RELATION

**Mathematical Induction:** Techniques of Proof – Mathematical Induction.

**Recurrence Relation:** Recurrence – an introduction – Polynomials and their Evaluations – Recurrence Relations – Solution of Finite Order Homogenous (Linear) Relations – Solution of Non– Homogenous Relations.

#### UNIT – III: MATRIX ALGEBRA

**Introduction** – Matrix Operations – Inverse of a Square Matrix – Elementary Operations and Rank of a Matrix – Simultaneous Equations – Inverse by partitioning – Eigen Values and Eigen Vectors.

#### UNIT – IV: GRAPH THEORY AND SUB GRAPHS

Basic Concepts : Definitions – Incidence and Degree – Sub Graph – Graph Isomorphism – Some special Classes of Graph – Paths , Cycles and Connectedness – Worked Examples – Matrix representation of Graphs – Adjacency Matrix of undirected graph – Incidence Matrix – Adjacency matrix of a digraph– Path Matrix (**except Algorithms**)

#### UNIT – V: LOGIC

Introduction – TF statements – Connectives – Atomic and Compound statements – Well formed Formulae – The Truth Table of a Formula – Tautological Implications and Equivalence of Formulae – Replacement Process

#### TEXT BOOK:

*Discrete Mathematics* – Dr. M.K. Venkataraman, Dr. N. Sridharan and Dr. N.Chandrasekaran, National Publishing Company, 2012.

**Unit I:** Page No Section 1.1 to 2.9. **Unit II:** Page 4.1 to 5.19

**Unit III:** Page 6.1 to 6.41 **Unit IV:** Page 11.1 to 11.54 **Unit V:** Page 9.1 to 9.39

#### REFERENCE BOOK:

*Discrete Mathematical Structures with Applications to Computer Science*, Tremblay and Manohar McGraw Hill, 1997

#### DIGITAL TOOLS:

- <https://www.coursera.org/specializations/discrete-mathematics>
- <https://www.javatpoint.com/discrete-mathematics-tutorial>
- <https://medium.com/basescs/a-gentle-introduction-to-graph-theory-77969829ead8>

#### Mapping of CO with PSO

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

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

**COURSE DESIGNER: Prof. V. B. SHAKILA**

Passed in the BoS Meeting held on 09/03/2024

Signature of the Chairman



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITS11	DIGITAL COMPUTER FUNDAMENTALS	SBS – 1	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### 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.

### COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	describe the basics of Number Systems, Codes	Upto K3
CO 2	understand the concept of logic gates and Boolean Laws and Theorems.	Upto K3
CO 3	develop the logic circuit using k– map and truth tables.	Upto K3
CO 4	know the design of multiplexer, demultiplexer, decoder and encoder.	Upto K3
CO 5	know binary addition and apply the concept of flipflop.	Upto K3

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





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### DIGITAL COMPUTER FUNDAMENTALS

#### UNIT – I:

Binary Numbers – binary to decimal – decimal to binary – octal – hexa decimal – ASCII code – Excess- 3 code – Gray Code.

#### UNIT – II:

Basic gates – Inverter – OR gates – AND gates – Universal Logic gates – NOR gates – NAND gates – Boolean Laws and Theorems.

#### UNIT – III:

Sum of product method – K- Map truth tables – Pairs, Quads, Octets – K- Map simplifications – Don't care – product of sum method – product of sum simplification.

#### UNIT – IV:

Multiplexers – Demultiplexers – 1- of – 16 Decoders – BCD – to – Decimal Decoder – 7 segment decoders – Encoders – Exclusive – OR gates – parity generators – checkers.

#### UNIT – V:

Binary Addition – Binary Subtraction – 2's & 1's complement representation – Complement Arithmetic – Arithmetic building blocks – Flip – flops: Edge triggered RS Flip – flop – Edge triggered JK Flip – flop.

#### 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

#### DIGITAL TOOLS:

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)

#### 3. Mapping of CO with PSO

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

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

**COURSE DESIGNER: Prof. T. R. SIVA SANKARI**

Passed in the BoS Meeting held on 09/03/2024

Signature of the Chairman



# SOURASHTRA COLLEGE, MADURAI – 625004

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### COURSE STRUCTURE – II SEMESTER

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	24UACT21	<b>Part – I: Tamil –</b> பொதுத் தமிழ் – II	6	3	25	75	100	3
	24UACH21	<b>Hindi –</b> General Hindi – II						
	24UACS21	<b>Sanskrit –</b> Prose, Grammar and History of Sanskrit Literature						
2.	24UACE21	<b>Part – II: English –</b> General English – II	6	3	25	75	100	3
3.	24UITC21	<b>Part – III: Core – 3:</b> Object Oriented Programming in C++	5	3	25	75	100	4
4.	24UITCP2	<b>Part – III: Core – 4:</b> <b>Lab :</b> Object Oriented Programming in C++	5	3	40	60	100	4
5.	24UITA21	<b>Part – III: Allied – 2:</b> Statistics	4	3	25	75	100	4
6.	24UITS21	<b>Part – IV: SBS – 2:</b> Computer Organization and Architecture	2	3	25	75	100	2
7.	24UACES1	<b>Part – IV:</b> Environmental Studies	2	3	25	75	100	2
		<b>TOTAL</b>	<b>30</b>				<b>700</b>	<b>22</b>

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

NME – Non –Major Elective

T – Theory

P – Practical



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITC21	OBJECT ORIENTED PROGRAMMING USING C++	CORE – 3	5	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### COURSE DESCRIPTION:

To gain the basic knowledge of object oriented programming concepts and techniques.

### COURSE OBJECTIVES:

- To know the Basic of C++ and Classes and Objects.
- To understand about Constructors, Overloading Concepts.
- To understand about various inheritance.

### COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	gain knowledge about object oriented programming concept and know operators and expressions	Upto K3
CO 2	understand and illustrate functions, classes and objects	Upto K3
CO 3	develop a practical knowledge about constructor, operator overloading and type conversion	Upto K3
CO 4	learn various types of inheritance	Upto K3
CO 5	develop application using files and know the concept of error handling and files	Upto K3

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



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### **OBJECT ORIENTED PROGRAMMING USING C++**

#### **UNIT – I: PRINCIPLES OF OBJECT ORIENTED PROGRAMMING (OOP)**

Software Evolution – OOP Paradigm – Basic Concepts of OOP – Benefits of OOP– Object Oriented Languages – Application of OOP – Introduction to C++– tokens, keywords, identifiers, variables, Operators, manipulators, expressions and Control structures in C++.

#### **UNIT – II: FUNCTIONS**

Functions in C++ – Main Function – Function Prototyping – Call by reference– return by reference – function overloading – Friend and virtual functions.

**Classes and Objects:** Defining Member Functions – Making an outside Function Inline – Nesting of Member Functions– Private Member Function – Arrays within a Class – Static Member Functions – Arrays of Object – Friend Functions.

#### **UNIT – III: CONSTRUCTORS AND DESTRUCTORS**

Introduction – Constructors – Parameterized Constructors – Constructors with Default Arguments – Copy constructors – Dynamic Constructors – .Destructors.

**Operator Overloading and Type Conversions:** Defining Operator Overloading – Overloading Unary Operators, Binary Operators – Rules for Overloading Operators – Type Conversions.

#### **UNIT – IV: INHERITANCE**

Single inheritance – Multilevel Inheritance – Multiple inheritance– Hierarchical Inheritance – Hybrid Inheritance – Pointers, virtual functions and polymorphism, Managing I/O operations.

#### **UNIT – V: WORKING WITH FILES**

Classes for file stream operations – Opening and closing a file – Detecting End of file – File pointers – Updating a file – Error Handling during file operations– command line arguments.

#### **TEXT BOOK:**

*Object Oriented Programming With C++*. E. Balagurusamy, 6<sup>th</sup> Edition Tata McGrawHill, NewDelhi.

#### **CHAPTERS and SECTIONS (For UNIT – I, II, III,IV and V)**

**Unit – I:** Chapter 1: 1.2, 1.4, 1.5, 1.6, 1.7, 1.8

Chapter 3: 3.1, 3.2, 3.3, 3.4, 3.10, 3.13, 3.19, 3.24

**Unit – II:** Chapter 4: 4.2, 4.3, 4.4, 4.5,4.9, 4.10

Chapter 5: 5.4, 5.6, 5.7, 5.8, 5.9, 5.12, 5.13, 5.15

**Unit – III:** Chapter 6: 6.1, 6.2, 6.3, 6.4, 6.7, 6.8, 6.11

Chapter 7: 7.2, 7.3, 7.4, 7.7, 7.8

**Unit – IV:** Chapter 8: 8.3, 8.5, 8.6, 8.7, 8.8. Chapter 9: 9.1 to 9.6

Chapter 10: 10.1 to 10.6

**Unit – V:** Chapter 11: 11.2, 11.3, 11.4, 11.5, 11.6,11.8,11.9, 11.10

#### **REFERENCE BOOKS:**

1. P.Radha Ganesan. *Programming Skills in C++*, Scitech Publications.
2. Richard L. Halterman *Fundamentals of Programming C++*.



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### DIGITAL TOOLS:

1. <https://www.javatpoint.com/cpp-tutorial>,
2. <https://www.learncpp.com/>
3. <https://www.w3schools.com/CPP>,
4. <https://www.programiz.com/cpp-programming>

### Mapping of CO with PSO

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

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

**COURSE DESIGNER: Prof. R.P.UMADEVI**



# SOURASHTRA COLLEGE, MADURAI – 625004

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITCP2	LAB : OBJECT ORIENTED PROGRAMMING USING C++	CORE – 6 LAB	-	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### COURSE DESCRIPTION:

This course is to develop students' practical knowledge to write coding using object oriented programming code and implement in various applications.

### COURSE OBJECTIVES:

- To make the students understand about programming in C++
- To make the students understand about programming in OOPs
- To make the students write reusable modules ( collection of functions)

### COURSE OUTCOMES (COs):

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

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	write programs using simple concepts of C++	Upto K3
CO 2	write programs using OOP's paradigm – Classes and objects	Upto K3
CO 3	apply constructors , destructors and overloading – functions	Upto K3
CO 4	utilize operators and Implementing types of Inheritance.	Upto K3
CO 5	design to write program using Files (Sequential and Random)	Upto K3

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



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### **LAB : OBJECT ORIENTED PROGRAMMING USING C++**

1. Program to display student details using class and object.
2. Program to calculate simple interest using Inline function.
3. Program to find maximum of two objects of two different classes using Friend functions.
4. Program to assign integer values using Constructors (copy, default and parameterized).
5. Program using to find the volume of various objects using Function Overloading concept.
6. Program to toggle the sign of an integer number using Unary Operator – overloading.
7. Program to add two complex numbers using Binary + operator overloading.
8. Program to calculate the total and average marks of a student using Single Inheritance.
9. Program to calculate the Academic and sports marks of a student using multiple Inheritance.
10. Program to find area of various objects using Hierarchical Inheritance using Virtual function.

**COURSE DESIGNER: Prof. R.P.UMADEVI**



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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITA21	STATISTICS	ALLIED – 2	4	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### 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 Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	identify the basic concepts of Central tendencies	Upto K3
CO 2	gain knowledge about Measures of Dispersion	Upto K3
CO 3	apply the idea of Correlation & Regression	Upto K3
CO 4	gain knowledge about the basic concepts of Theory of Attributes	Upto K3
CO 5	gain knowledge about Index Numbers	Upto K3

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





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### STATISTICS

#### UNIT – I: CENTRAL TENDENCIES

Introduction – Arithmetic Mean (AM) – Partition values (Median, Quartiles, Deciles and Percentiles) – Geometric Mean and Harmonic Mean.

#### 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 – Skewness – Kurtosis

#### UNIT – III: CORRELATION AND REGRESSION

Introduction – Correlation – Karl Pearson coefficient of correlation – Rank Correlation – Repeated ranks – Regression – Lines of regression

#### UNIT – IV: THEORY OF ATTRIBUTES

Introduction – Attributes – consistency of Data – Independence and Association of data.

#### UNIT – V: INDEX NUMBERS

Index numbers – consumers price Index Numbers – Conversion of chain base Index Number into fixed base index and conversely

#### TEXT BOOK:

*Statistics*. Dr. S. Arumugam & A.Thangapandi Issac. New Gamma Publishing House, July 2013

- Unit I: Chapter 2. Page no: 11– 59
- Unit II: Chapter 3 and 4. Page no: 60 – 94
- Unit III: Chapter 6. Page no: 106 – 154
- Unit IV: Chapter 8. Page no: 196 – 228
- Unit V: Chapter 9. Page no: 229 – 257

#### REFERENCE BOOK:

*Fundamentals of Mathematical Statistics*. S.C. Gupta & V.K. Kapoor, Sultan Chand and Sons, 2004.

#### DIGITAL TOOLS:

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	3	3	2	2	1	1
CO2	3	2	1	2	1	1
CO3	3	2	1	3	1	1
CO4	3	2	3	3	1	1
CO5	3	2	2	3	1	1

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

**COURSE DESIGNER: Prof. V.B.SHAKILA**

Passed in the BoS Meeting held on 09/03/2024

Signature of the Chairman



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## B.Sc. INFORMATION TECHNOLOGY – SYLLABUS

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UITS21	COMPUTER ORGANIZATION AND ARCHITECTURE	SBS – 2	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

<b>NATURE OF COURSE</b>	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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### 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 Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	acquire knowledge on registers, instructions , timing and control	Upto K3
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	Upto K3
CO 3	identify the memory requirement of a CPU and and understands the working principles of parallel processing and pipeline processing	Upto K3
CO 4	gain knowledge on usage of I/O interfaces and various types of data transfers	Upto K3
CO 5	understand various types of memory and its organizations	Upto K3

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



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### 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 3<sup>rd</sup> 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 BOOK:

*Computer Organization* V. Carl Hamacher, Zconko G. Vranesic, Safwat G. Zaky 4<sup>th</sup> Edition, McGraw– Hill International Editions.

#### DIGITAL TOOLS:

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	3		1			
CO2		2	1			2
CO3	2	2			1	
CO4			2	3		1
CO5	2			3	1	1

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

**COURSE DESIGNER: Prof. T. R. SIVA SANKARI**