

**SAKTHI COLLEGE OF ARTS AND SCIENCE FOR WOMEN, ODDANCHATRAM**

**(Recognized Under Section 2(f) and 12(B) of UGC Act 1956)**

**(Affiliated to Mother Teresa Women's University, Kodaikanal)**

**PG AND RESEARCH DEPARTMENT OF COMPUTR SCIENCE**

**CURRICULUM FRAMEWORK AND SYLLABUS FOR**

**OUTCOME BASED EDUCATION IN**

**SYLLABUS FOR**

**B.Sc., COMPUTER SCIENCE**

**FRAMED BY**

**MOTHER TERESA WOMEN'S UNIVERSITY, KODAIKANAL**

**UNDER**

**CHOICE BASED CREDIT SYSTEM**

**2018 - 2021**

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**PREAMBLE:**

B.Sc., (Computer Science) is a broad and flexible degree programme introduced in the academic year 2009 – 2010, as a self supporting programme, with the curriculum specifically designed by Mother Teresa Women’s University, Kodaikanal to reflect the depth and breadth of computer science. The department has made its foray into Postgraduate education in 2014 and Pre-doctoral Programme (M. Phil.,) in 2015, with the ultimate aim of bringing the young rural women students to the scenario of higher education. Specialized courses, to suit the industry needs have been introduced in the curriculum, based on the inputs collected from experts in academia and industry. To enhance the quality of the programmes further, the department adheres to Outcome Based Education (OBE) since 2018-2019.

**VISION:**

- ✚ Employing women in the field of Information Technology.
- ✚ Moulding rural women into Future Leaders.

**MISSION:**

- ✚ Training students in latest trends in IT Field.
- ✚ Motivating students to organize IT related competitions.
- ✚ Conducting special lectures for the students to advance the state of the art in computer science and IT Field.
- ✚ Training students to do projects in recent technologies.

**OBJECTIVES:**

- ✚ Producing employable workforce, that will have a breadth and depth of knowledge in the discipline of computer science.
- ✚ Developing academically competent and professionally motivated personnel, equipped with objective, critical thinking, right moral and ethical values that compassionately foster the scientific temper with a sense of social responsibility.
- ✚ Developing skilled manpower in the various areas like: Data base management, Software Development, Computer-Languages, Software engineering, Web based applications etc.

**FIXING THE LEARNING OBJECTIVES:**

Since the Academic year 2018 – 2019, the learning objectives and outcomes of the Programmes of B.Sc., (CS), M.Sc., (CS) and M.Phil., (CS) have been set, following the Bloom’s Taxonomy Cognitive Domain. Accordingly, it is broken into six levels of learning objectives of each course. They are -

K1 / Knowledge = Remember

K2 / Comprehension = Understand

K3 / Application = Apply

K4 / Analysis = Analyze

K5 / Evaluation = Evaluate

K6 / Synthesis = Create

### **MAPPING COS WITH POS:**

For each Programme, the Educational Objectives and the Specific Objectives are specified. The Programme Outcomes are designed according to the curriculum, teaching, learning and evaluation process. For each course, the definite Outcomes are set, giving challenge to the cognitive domain. The Course Outcomes are mapped with the Programme Outcomes. The performance of the stakeholders is assessed and the attainment rate is fixed, by using the measurements 'high', 'medium' and 'low'. The restructuring of the curriculum is done based on the rate of attainment.

### **INSTITUTIONAL OBJECTIVES:**

The institution has certain definite Institutional Objectives to be attained.

- Skill Development & Capacity Building
- Women Empowerment
- Self-reliance
- Gender Equity & Integrity

### **PROGRAMME EDUCATIONAL OBJECTIVES:**

The Programmes B.Sc., M.Sc., and M. Phil., (CS) are offered with certain Specific Educational Objectives.

**PSO1:** Understanding of the basics of computer science.

**PSO2:** Applying fundamental principles and methods of Computer Science to a wide range of applications and mathematical and scientific reasoning to a variety of computational problems.

**PSO3:** Developing foundational skills to install and maintain computer networks, troubleshoot hardware and software problems.

### **Mapping PEOs with IOs:**

<b>Programme Educational Objectives</b>	<b>Institutional Objectives</b>			
<b>B.Sc., M.Sc., and M. Phil., (CS)</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>PEO1:</b> Understanding of the basics of computer science.	*			
<b>PEO2:</b> Applying fundamental principles and methods of Computer Science to a wide range of applications and mathematical and				

scientific reasoning to a variety of computational problems.		*		
<b>PEO3:</b> Developing foundational skills to install and maintain computer networks, troubleshoot hardware and software problems.			*	*

**Measuring: H – High; M – Medium; L – Low**

## **B.Sc., COMPUTER SCIENCE**

### **PROGRAMME OUTCOMES:**

After completion of B.Sc., (CS) Programme, certain outcomes are expected from the learners.

**PO1:** Designing and implementing software systems that meet specified design and performance requirements

**PO2:** Applying advanced algorithmic and mathematical concepts to the design and analysis of software.

**PO3:** Adhering to do higher studies or progress as an entrepreneur.

**PO4:** Gaining confidence to survive and get succeed in IT industry.

**PO5:** Acquiring proficiency in the practice of computing, and to prepare them for continued professional development.

**PO6:** Applying sound principles to the synthesis and analysis of computer systems

**PO7:** Being capable of managing databases and developing web pages.

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**ASSESSMENT PATTERN**  
**CIA / QUESTION PATTERN & SCHEME**

S.No	Section	Question Type	Marks Allotted
1	Part - A	Six questions in multiple choice pattern, testing K1 and K2 are to be given. Each question carries one mark.	03X01 = 03
2	Part - B	Two descriptive questions, with alternate options, testing K3 and K4, are to be given. Each question carries four marks.	02X02 = 04
3	Part - C	Two descriptive questions, testing K5 and K6, are to be given. Three questions are to be answered. Each question carries 15 marks.	02X04 = 08
4		Assignment	05
5		Seminar	05
Total Marks in CIA			25

**CE / QUESTION PATTERN & SCHEME**

S.No	Section	Question Type	Marks Allotted
1	Part - A	Ten questions in multiple choice pattern, testing K1 and K2 are to be given. From each unit, two questions must be taken. Each question carries one mark.	10X1 = 10
2	Part - B	Five descriptive questions, with alternate options, testing K3 and K4, are to be given. Each question carries four marks. Questions are taken in the given order. Qtn. No. 11 (a) or (b) from Unit I Qtn. No.12 (a) or (b) from Unit II Qtn. No.13 (a) or (b) from Unit III Qtn. No.14 (a) or (b) from Unit IV Qtn. No.15 (a) or (b) from Unit V	5X4 = 20
3	Part - C	Six descriptive questions, testing K5 and K6, are to be given. Three questions are to be answered. Each question carries 15 marks. Questions are taken in the given order. Qtn. No. 16 from Unit I Qtn. No. 17 from Unit II Qtn. No. 18 from Unit III Qtn. No. 19 from Unit IV Qtn. No. 20 from Unit V	3X15 = 45
Total Marks in CE			75

**COMMON STRUCTURE / B.Sc., (CS) / 2018 - 2021**

**I SEMESTER**

S.No	Sub. Code	Title of the Course	HRS	CREDITS	CIA	CE	Total
01.	ULTA11	Part – I Tamil	6	3	25	75	100
02.	ULEN11	Part – II English	6	3	25	75	100
03.	UCST11	Part – III / Core – I / Programming in C	5	4	25	75	100
04.	UCST12	Part – III / Core – II / Digital Principles & Computer Organization	5	4	25	75	100
05.	UCSA11	Part – III / Allied – I / Discrete Mathematics	5	4	25	75	100
07.	UVAE11	ONME / Value Education	3	3	25	75	100
		<b>Total</b>	<b>30</b>	<b>21</b>			<b>600</b>

**II SEMESTER**

S.No	Sub. Code	Title of the Course	HRS	CREDITS	CIA	CE	Total
01.	ULTA22	Part – I Tamil	6	3	25	75	100
02.	ULEN22	Part – II English	6	3	25	75	100
03.	UCST21	Part – III / Core – III / Programming in C++	6	4	25	75	100
04.	UCSP21	Part – III / Core Practical – I / Programming in C and C++Lab	5	4	25	75	100
05.	UCSA21	Part – III / Allied – II / Web Designing Lab	5	4	25	75	100
06.	UEVS21	ONME – I / Environmental Studies	2	2	25	75	100
		<b>Total</b>	<b>30</b>	<b>20</b>			<b>600</b>

**III SEMESTER**

S.No	Sub. Code	Title of the Course	HRS	CREDITS	CIA	CE	Total
01.	ULTA33	Part – I Tamil	6	3	25	75	100
02.	ULEN33	Part – II English	6	3	25	75	100
03.	UCST31	Part – III / Core – IV / Fundamentals of Data Structures	5	4	25	75	100
04.	UCSA32	Part – III / Allied – III / Operation Research	5	4	25	75	100
05.	UCSE31	Part – III / Elective – I / Fundamentals of Computer Algorithms	4	3	25	75	100
06.	UCSN31	NME - I	2	2	25	75	100
07.	UCSS31	SBE – I / Office Automation Lab	2	2	25	75	100
		<b>Total</b>	<b>30</b>	<b>21</b>			<b>700</b>

**IV SEMESTER**

S.No	Sub. Code	Title of the Course	HRS	CREDITS	CIA	CE	Total
01.	ULTA44	Part – I Tamil	6	3	25	75	100
02.	ULEN44	Part – II English	6	3	25	75	100
03.	UCST41	Part – III / Core – V / Relational Database Management Systems	4	4	25	75	100
04.	UCSP42	Part – III / Core Practical – II / Relational Database Management Systems Lab	4	4	25	75	100
05.	UCSA42	Part – III / Allied – IV / DTP Lab	3	4	25	75	100
06.	UCSE42	Part – III / Elective – II / Numerical Methods	3	3	25	75	100
07.	UCSN42	NME - II	2	2	25	75	100
08.	UCSS42	SBE – II / Linux\Unix Lab	2	2	25	75	100
		<b>Total</b>	<b>30</b>	<b>25</b>			<b>800</b>

**V SEMESTER**

S.No	Sub. Code	Title of the Course	HRS	CREDITS	CIA	CE	Total
01.	UCST51	Part – III / Core – VI / System Software	5	4	25	75	100
02.	UCST52	Part – III / Core – VII / Data Mining	5	4	25	75	100
03.	UCST53	Part – III / Core – VIII / Data Mining Software Engineering	5	4	25	75	100
04.	UCST54	Part – III / Core – IX / Data Mining Computer Networks	5	4	25	75	100
05.	UCST55	Part – III / Core – X / Multimedia & its Application	5	4	25	75	100
06.	UCSE53	Part – III / Elective – III / Visual Basic Lab	3	3	25	75	100
07.	UCSS53	SBE – III / Python Lab	2	2	25	75	100
		<b>Total</b>	<b>30</b>	<b>25</b>			<b>700</b>

**VI SEMESTER**

S.No	Sub. Code	Title of the Course	HRS	CREDITS	CIA	CE	Total
01.	UCST61	Part – III / Core – XI / Java and Internet Programming	5	4	25	75	100
02.	UCST62	Part – III / Core – XII / Web Technology	5	4	25	75	100
03.	UCST63	Part – III / Core – XIII / Computer Graphics	5	4	25	75	100
04.	UCSP63	Part – III / Core Practical – III / Java And	5	4	25	75	100

		Internet Programming Lab					
05.	UCSP64	Part – III / Core Practical – IV / Web Technology Lab	5	4	25	75	100
06.	UCSE64	Part – III / Elective – IV / Mini Project	3	3	25	75	100
07.	UCSS64	SBE – IV / Computer Graphics Lab	2	2	25	75	100
08.	UEAS61	Extension Activities	-	3	25	75	100
		<b>Total</b>	<b>30</b>	<b>28</b>			<b>800</b>

	I	II	III	IV	V	VI	TOTAL
<b>Total Credits</b>	<b>21</b>	<b>20</b>	<b>21</b>	<b>25</b>	<b>25</b>	<b>28</b>	<b>140</b>
<b>Total Marks</b>	<b>600</b>	<b>600</b>	<b>700</b>	<b>800</b>	<b>700</b>	<b>800</b>	<b>4200</b>

### SEMESTER I

**CODE: UCST11**

**PROGRAMMING IN C**

**5 HRS/ 4 CREDITS**

#### Course Outcomes:

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining complete knowledge of C Language.	Knowledge (Level – 1)
<b>CO2:</b> Understanding and developing well-structured programs using C language.	Comprehension (Level – 2)
<b>CO3:</b> Acquiring problem solving skills through computer programming.	Application (Level – 3)
<b>CO4:</b> Developing logics which will help them to create programs, applications in C.	Analysis (Level – 4)
<b>CO5:</b> Dealing with different memory allocation & input/output methods.	Synthesis (Level – 6)

### COURSE CONTENT

#### UNIT I

History of C, Importance of C, Structure of C program, Programming style, Executing a C Program, keywords, identifiers, constants, variables, data types, type conversion, Types of operators and expressions, Managing Input and output operations in C.

#### UNIT II

Decision making and Branching: Decision Statement –IF-ELSE statement, and nested IF statement break, continue, goto, switch() case. Loop Control Statements –For loop, While loop, Do-while loop and nested loops.

Arrays –Definition, Initialization, characteristics, One, Two, Three and Multidimensional Arrays, Working with Strings & Standard Functions.

### **UNIT III**

Functions –Declaration, Prototype, Types of functions, call by value and reference, Function with operators, function with decision statements, function with Loop statements, Function with Arrays, Types of Storage Classes.

### **UNIT IV**

Structure and Union –Declaration, Initialization, structure within structure, Array of Structure, Enumerated data types, Union of structure, Files – Streams and file types, file operations, File I/O, Read, Write and Other file function

### **UNIT V**

Pointers –Introduction, features, Declaration, Arithmetic operations, pointers and Arrays, Array of pointers, pointers to pointers, pointers and strings, Pointers to structures.

### **Text Books**

1. Programming in ANSI C by E. Balaguruswamy, Tata McGraw Hill Publishing Company, 2002.

### **Reference Books**

1. Programming Techniques through C – A beginners Companion by M.G. Vankatesh Murthy, Pearson education, New Delhi, 2002.
2. Programming in C and C++ by S. Chand & Company Ltd., New Delhi, 2002.

**CODE: UCST12 DIGITAL PRINCIPLES & COMPUTER ORGANIZATION 5 HRS/ 4 CREDITS**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge of multiprocessor organization and parallel processing	Knowledge (Level – 1)
<b>CO2:</b> Understand the theory and architecture of central processing unit.	Comprehension (Level – 2)
<b>CO3:</b> Exemplify in a better way the I/O and memory organization.	Application (Level – 3)
<b>CO4:</b> Analyzing some of the design issues in terms of speed, technology, cost, performance	Analysis (Level – 4)
<b>CO5:</b> Defining different number systems, binary addition and subtraction, 2's complement representation and operations with this representation	Synthesis (Level – 6)

**COURSE CONTENT**

**UNIT I**

Number Representation: Number system – Binary – Hexa Decimal – Octal codes – BCD – Excess 3 – Gray codes – ASCII – EBCDIC – Boolean algebra: Boolean laws – Logic gates – K. Map: sum of products – Product of sum method.

## **UNIT II**

Encoder – Decoder – Multiplexer – Negative Number: 1's & 2's Complement – Half & Full adder.

## **UNIT III**

Flip – Flop: RS, D, JK - Triggering – Registers: Four shift registers - Counters.

## **UNIT IV**

Data & Instructer format fixed print & floating point – Number representation – representation of singed numbers – Alpha numeric representation – Arthimetic and logical Units -, +, \*, / with singed number – Floating point arthimetic operation logical operation.

## **UNIT V**

Central Processor unit: Processor bus organization – Instruction format – Addressing modes – data transfer & Manipulation – Memory and I/O units – Main Memory – RAM and ROM address space – Assosiative – Virtual cache Memory – I/O bus verses memory bus.

## **Text books**

1. Digital Principles and Design By Malvino Leach, Fourth Edition TMH Publications.
2. Digital Principles By Thomas C. Bartee, TMH Publications.
3. Computer systems Architecture by Moris Mano, M. PILL Publications.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
CO1: Comprehending the Boolean algebra	Comprehension (Level – 2)
CO2: Applying logical notation and determining the validity of the argument	Application (Level – 3)
CO3: Applying counting principles to determine probabilities	Application (Level – 3)
CO4: Evaluating Boolean functions and simplify expressions using the properties of Boolean algebra	Evaluation (Level – 5)
CO5: Demonstrating an understanding of relations and functions and be able to determine their properties	Synthesis (Level – 6)

**COURSE CONTENT****UNIT I**

Review of theory of sets – Relations – Equivalence Relations – partial Order – Function – Binary Operations.

**UNIT II**

Logic – Introduction – connectives – Truth Table – Tautology – Implications – Equivalences.

**UNIT III**

Groups – Definitions & Examples – Elementary – Properties – Sub Groups – Cycle groups – Cosets and Lagrange's Theorem – Normal Subgroups.

**UNIT IV**

Matrices – Special type of Matrices – operations – Inverse of a Matrices – Elementary Transformation – Rank of Matrix – Simultaneous Linear Equation – Eigen values and Eigen vectors – Cayley Hamilton theorem.

**UNIT V**

Partial Ordering – Posets – Hasse Diagram - Lattices – Properties – Sub Lattices – Special lattices – Boolean Algebra.

**Text Books**

1. Modern algebra & S. Arumugam & Thangapandi Issac, New Gamma Publishing House, Palamkottai.
2. Discrete mathematics by M.K. Venkataramanan and N. Chandrasekaran, nation publishing CO., Chennai.

## SEMESTER-II

CODE: UCST21

PROGRAMMING IN C++

6 HRS/ 4 CREDITS

### Course Outcomes:

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Comprehending the Templates, Files and Exception Handling	Comprehension (Level – 2)
<b>CO2:</b> Applying the concepts of class, method, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism	Application (Level – 3)
<b>CO3:</b> Analyzing problems and implementing simple C++ applications using an object-oriented software approach.	Analysis (Level – 4)
<b>CO4:</b> Analyzing, writing, debugging and testing basic C++ codes using the approaches introduced in the course	Analysis (Level – 4)
<b>CO5:</b> Demonstrating the use of virtual functions to implement polymorphism.	Synthesis (Level – 6)

### COURSE CONTENT

#### UNIT I

Principles of object Oriented Programming : Software Evolution – Basic concepts of object Oriented Programming – Benefits of OOPS – Object Oriented Language – Application of OOPS – Beginning with C++

#### UNIT II

Token, Expressions and Control Structure Functions : Token – Keyword – Identifier and constant – Basic Data Types – User defined data type- Derived data type – Operators in C++ - Scope Resolution Operator – Member dereferencing Operator – Manipulators – Type cast Operators –Expression and their types – Implicit conversion – Control structures.

#### UNIT III

Classes and Objects – Constructor and Destructors – Operator overloading and Type conversions.

#### UNIT IV

Inheritance: Extending Classes – Pointers, Virtual Function and Polymorphism – Managing consoles I/O operations.

#### UNIT V

Working with Files – Templates – Exception Handling.

**Text Book**

1. Object oriented Programming with C++ by E. Balagurusamy Tatta McGraw Hill Publishing Company Limited 1998 Chapter: 1 to 11.
2. C++, the Complete Reference Herbert Schlitz, 1997.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Understanding and applying Object oriented features and C++ concepts.	Comprehension (Level – 2)
<b>CO2:</b> Applying the concept of polymorphism and inheritance, exception handling and templates.	Application (Level – 3)
<b>CO3:</b> Implementing different functions for input and output, various data types, basic operators, files and functions	Application (Level – 3)
<b>CO4:</b> Analysing the concepts and principles of the programming language to the real-world problems and solve the problems through project-based learning.	Analysis (Level – 4)
<b>CO5:</b> Demonstrating basic object oriented and structured programming concepts.	Synthesis (Level – 6)

**Exercises:****C**

1. Simple Programs
2. Arrays
3. Strings
4. Functions
5. Recursion
6. Structures
7. Pointers
8. Arrays with Structures
9. Arrays with Pointers
10. Files

**C++**

1. Simple Programs
2. Arrays
3. Strings
4. Functions

5. Recursion
6. Structures
7. Pointers
8. Arrays with Structures
9. Arrays with Pointers
10. Files
11. Call by value & call by reference method
12. Inline function in C++
13. Function overloading
14. Default Arguments
15. Operator overloading
16. Program using Inheritance
17. Program using polymorphism and virtual functions
18. File concepts

**CODE: UCSA21**

**WEB DESIGN LAB**

**5 HRS/ 4 CREDITS**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge of user interfaces, with graphics, textual components, and navigation systems.	Knowledge (Level – 1)
<b>CO2:</b> Comprehending various HTML tags for designing a static web page.	Comprehension (Level – 2)
<b>CO3:</b> Designing and applying XML to create a markup language for data and document centric application	Application (Level – 3)
<b>CO4:</b> Being capable of writing a server side java application called JSP to catch form data sent from client and store it on database.	Analysis (Level – 4)
<b>CO5:</b> Creating personal and/or business websites following current professional and/or industry standards	Synthesis (Level – 6)

**Exercise:**

**HTML**

1. Web page creation using head, title, body, h1 – h6.
2. Web page creation using formatting tags (bold, italic, underline etc)
3. Ordered list
4. Unordered list
5. Definition list
6. Marquee creation
7. Web page with images
8. Web page creation with various font styles and body colors.
9. Hyper link
10. Tables
11. Frames
12. Forms

**XML**

13. Simple XML Programs

**14. XML and CSS**

**15. XML and XSLT**

**16. Parsing XML and the XML DOM**

**17. XML Output from a Server**

## SEMESTER – III

**CODE: UCST31    FUNDAMENTALS OF DATA STRUCTURES    5 HRS/ 4 CREDITS**

### Course Outcomes:

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining in-depth knowledge in dealing with Data and its Structures	Knowledge (Level – 1)
<b>CO2:</b> Understanding the concepts of Stack & Queue, tree & its traversal techniques & Graphs and its components	Comprehension (Level – 2)
<b>CO3:</b> Applying searching and sorting techniques	Application (Level – 3)
<b>CO4:</b> Analyzing the algorithms and algorithm correctness	Analysis (Level – 4)
<b>CO5:</b> Describing stack, queue and linked list operation	Synthesis (Level – 6)

### COURSE CONTENT

#### UNIT I

ARRAY: Axiomatization – Ordered Lists – Sparse Matrices – Representation of Arrays.

#### UNIT II

STACKS AND QUEUES: Fundamentals – Amazing Problem – Evaluation of expressions – Multiple Stack and Queues.

#### UNIT III

LINKED LIST: Singly Linked List, Linked Stacks and Queues – The Storage Pool - Polynomial Addition – Doubly Linked list and Dynamic Storage Management – Garbage Collection and Compaction.

#### UNIT IV

TREES: Basic Terminology – Binary Trees – Binary Tree Representations – Binary Trees Traversal – More on Binary Trees – Threaded Binary trees – Binary Trees Representation of Trees

#### UNIT V

GRAPHS: Terminology and Representations: Introduction – Definitions and Terminology – Graph representations – Traversal, Connected components and Spanning Trees.

**Text Book**

1. Fundamentals of Data Structure by Ellis Horowitz Sartaj Sahnia Galgotia Publications, 1998.
2. Reference: Sam Series (Dynamic Storage Management)

**Reference Book**

3. Data Structure, Algorithms and Applications in C++ Sartaj Sahni McGraw Hill 1998.
4. Data Structure, Algorithms and Applications in C++, Sartaj Sahni, TMH 1988.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Understanding the Mathematical Formation of L.P.P	Comprehension (Level – 2)
<b>CO2:</b> Understanding the usage of game theory and Simulation for Solving Business Problems	Comprehension (Level – 2)
<b>CO3:</b> Formulating and solving problems as networks and graphs using special solution algorithms.	Application (Level – 3)
<b>CO4:</b> Analyzing the transportation Problem and Assignment Problem	Analysis (Level – 4)
<b>CO5:</b> Solving Linear Programming Problems	Synthesis (Level – 6)

**COURSE CONTENT****UNIT I**

Development of OR – Definition OR – General methods for solving OR models – main characteristics and Phases of OR study – tools, techniques and methods – scientific methods in OR – Scope of OR.

**UNIT II**

Linear Programming Problem – Mathematical formation of L.P.P. – Slack and surplus variables – graphical solution of L.P.P.

**UNIT III**

Simplex method – computational procedure – Artificial Variables technique - two phase method – Duality in linear programming.

**UNIT IV**

Mathematical formulation of transportation problem – optimal solution of T.P. – Methods for obtaining an initial feasible solution – Optimal solution – Degeneracy in T. Unbalance T.P.

**UNIT V**

Mathematical Formulation of Assignment Problem- Assignment Algorithm – Optimal Solution of Assignment Problem- -Unbalance Assignment Solution – Balanced Assignment Solution.

**Text Books:**

1. Operations Research – S.D. Sharma (Kedarnath Ramanath & COBOL) chapter 1 to 6 (all section).

**Reference Books:**

2. Operations Research- KantiSwarup, P.K Gupta &Manmohan, Sultan Chand &Sons publications, Sixteenth Revised Edition 2009.
3. Resource Management Techniques – Prof.V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan, AR Publications Revised Edition 2010.

**CODE: UCSE31      FUNDAMENTALS OF COMPUTER ALGORITHMS    4 HRS/ 3CREDITS**

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**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Knowing the standard comparison based sorts and their strengths and weaknesses	Comprehension (Level – 2)
<b>CO2:</b> Comprehending stacks, queues, linked lists, rooted trees; their standard implementations; and the analysis of these implementations	Comprehension (Level – 2)
<b>CO3:</b> Applying important algorithmic design paradigms and methods of analysis.	Application (Level – 3)
<b>CO4:</b> Analyzing the complexities of various problems in different domains	Analysis (Level – 4)
<b>CO5:</b> Using the standard linear-time sorts and the trade-offs involved in using them Data Structures and their analysis	Synthesis (Level – 6)

## COURSE CONTENT

### UNIT I

Introduction: Divide and conquer: General Method-binary search-finding the maximum and minimum – Merge sort – Quick sort – Selection sort.

### UNIT II

The greedy method: General method -Optimal storage on tapes - Knapsack problem – Job sequencing with deadlines – Minimum spanning trees, Single Source Shortest path.

### UNIT III

Dynamic Programming: General method – Multistage graphs – All pairs shortest paths – Optimum Binary search Trees –0/1 Knapsack – the travelling salesman problem – Flow shop scheduling.

### UNIT IV

Basic search and Traversal Techniques: The techniques – Code optimization – AND/OR graphs – Biconnected components and Depth – First search – Breadth first search.

### UNIT V

Backtracking: General Method- 8 Queens Problem – Hamiltonian cycles – Knapsack problem – Euler circuit.

Branch and bound: Travelling Salesman – Efficiency consideration.

### Text Book:

Fundamentals of Computer Algorithms by Ellis Horowitz and Sartaj Sahni, Galgotia publications, New Delhi.



**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of documentation	Comprehension (Level – 2)
<b>CO2:</b> Comprehending the performance of accounting operations	Comprehension (Level – 2)
<b>CO3:</b> Applying the gained knowledge and preparing Documents Using Formatting options	Application (Level – 3)
<b>CO4:</b> Analyzing the various innovative techniques of Slide show animation	Analysis (Level – 4)
<b>CO5:</b> Being capable of handling Basic Data Processing Work in Working Environment	Synthesis (Level – 6)

**Exercise:****MS-WORD**

1. Preparing Documents Using Formatting options.
2. Table preparation
3. Find and Replace
4. Mail merge
5. Header and Footer
6. Drop cap

**MS-EXCEL**

1. Payroll calculation
2. Mark sheet preparation using mathematic function
3. Chart preparation

**MS –ACCESS**

1. Table creation
2. Query processing
3. Form
4. Report generation

**MS-POWER POINT**

1. Slide show animation

## SEMESTER – IV

**CODE: UCST41 RELATIONAL DATA BASE MANAGEMENT SYSTEMS 4HRS/ 4 CREDITS**

### Course Outcomes:

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the database concepts and structures and query language	Comprehension (Level – 2)
<b>CO2:</b> Comprehending the overview of Data Base systems & Data Models	Comprehension (Level – 2)
<b>CO3:</b> Analyzing the principles of storage structure and recovery management	Analysis (Level – 4)
<b>CO4:</b> Executing various advance SQL queries and Understand query processing and techniques.	Analysis (Level – 4)
<b>CO5:</b> Performing PL/SQL programming using concept of Cursor Management, Error Handling, Package and Triggers	Synthesis (Level – 6)

## COURSE CONTENT

### UNIT I

Introduction: Purpose of data base systems – View of data – Data models – Database languages – Transaction management – Storage management – Database Administrator – Database users – Overall system structure.

### UNIT II

Entity – Relationship Model-Basic concepts – Design issues – Mapping cardinalities – Keys – E-R Diagrams – Weak entity sets – Extended E-R features – Design of an E-R Database scheme – Reduction of an E-R scheme to table.

### UNIT III

Relational Model: Structure of relational databases – Relational algebra – The tuple relational calculus – The domain relational calculus – Extended relational – Algebra operations – Modification of the database – Views.

### UNIT IV

Other Relational Languages & Integrity Constraints:

Query by Example – Quel – Datalog – Domain constraints – Referential Integrity – Assertions – Triggers – Functional dependencies.

### UNIT V

PL/SQL – Relationships between SQL & PL/SQL –Advantages of PL/SQL – arithmetic & expressions in PL/SQL – Loops and conditional statements in PL/SQL – Exceptions Handling – Cursor management – Triggers – Functions & Procedures.

**Text Book**

Data base system concepts(third edition)- abraham silberschtz, henry f.korth l.sudershan, mcg hill international editions, 1997.

**Reference books**

1. S.AT'RE-DS Techniques for Design, Performance& Management-John Wiley&sons.
2. James W Martin n-principles of database management-prentice hall,1979.
3. C.I.DATE an Introduction to DBS-addition Wesley,1981.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Knowing the connectivity of databases with controls (DAO,ADO & RDO)	Knowledge (Level – 1)
<b>CO2:</b> Becoming familiar with SQL fundamental Concepts.	Comprehension (Level – 2)
<b>CO3:</b> Applying Normalization techniques to normalize a database	Application (Level – 3)
<b>CO4:</b> Evaluating the underlying concepts of database technologies	Evaluation (Level – 5)
<b>CO5:</b> Designing and implementing a database scheme for a given problem-domain	Synthesis (Level – 6)

**COURSE CONTENT**

**Exercise:**

**PL/SQL**

1. Program using conditional control, interactive controls & sequential controls.
2. Program using exception handling
3. Programs using explicit cursors & implicit cursors
4. Program using PL/SQL tables & records
5. Programs using database triggers
6. Program to design procedures using In, Out, Parameter
7. Program to design procedures using functions
8. Program to design procedures using packages
9. Program using ADO, DAO & RDO connectivity.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Acquiring knowledge of typography e.g. font size, style, kerning, alignment, hyphenation and line spacing	Knowledge (Level – 1)
<b>CO2:</b> Comprehending the difference between DTP and how it differs from word processing procedures	Comprehension (Level – 2)
<b>CO3:</b> Identifying desktop publishing terminology and concepts	Application (Level – 3)
<b>CO4:</b> Developing the Visiting card,advertisement through various application	Synthesis (Level – 6)
<b>CO5:</b> Creating and printing a multi-page document which incorporates a variety of visual elements	Synthesis (Level – 6)

**COURSE CONTENT****Exercise:****Page Maker**

1. Visiting Card in English
2. Advertisement
3. Certificate
4. Wedding Invitation card in English
5. Greeting Card
6. Prospectus
7. Flow Chart
8. Calendar

**Corel Draw**

1. India Map
2. Cartoon
3. Rangoli
4. Logos in Tamil
5. Fashion Designing
6. Jewel Designing
7. Greeting card

**PhotoShop**

1. Flex Designing
2. Photo Editing

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of Newton's Formulae, Gaussian Quadrature and Euler's method	Knowledge (Level – 1)
<b>CO2:</b> Understanding Numerical Computations and direct and iterative method	Comprehension (Level – 2)
<b>CO3:</b> Applying numerical methods to obtain approximate solutions to mathematical problems.	Application (Level – 3)
<b>CO4:</b> Being capable of working effectively in a broad range of numerical computations	Synthesis (Level – 6)
<b>CO5:</b> Demonstrating understanding of common numerical methods their use in obtaining approximate solutions to otherwise intractable mathematical problems.	Synthesis (Level – 6)

**COURSE CONTENT****UNIT I**

Algebraic and transcendental equations : Errors in numerical computations – iteration methods – bisection methods – regular false methods – Newton Rap son method.

**UNIT II**

Simultaneous equations – back substitutions – gauss elimination method – gauss serial iteration method – comparison of direct and iterative method.

**UNIT III**

Interpolation – Newton's Formulae – gauss interpolation formulae Language's Interpolation formula – inverse interpolation.

**UNIT IV**

Numerical Differentiation: Newton's formulae – Numerical integration – Simpson's Rule – Gaussian Quadrature.

**UNIT V**

Numerical solution of differential equations: Euler's method - Taylor series method – Range Kati methods – Predictor Corrector methods.

**Text books:**

Numerical methods by S.Arumugam and S.Thangapandi Issac, A.Somasundaram, Scitech publications, Chennai -2002

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the concepts, design, and structure of the UNIX/LINUX operating system.	Knowledge (Level – 1)
<b>CO2:</b> Comprehending and handling UNIX system calls	Comprehension (Level – 2)
<b>CO3:</b> Applying various UNIX commands on a standard UNIX/LINUX Operating system	Application (Level – 3)
<b>CO4:</b> Mastering various process management concepts including scheduling, synchronization and semaphores.	Synthesis (Level – 6)
<b>CO5:</b> Being capable of doing shell programming on UNIX OS	Synthesis (Level – 6)

**COURSE CONTENT****Exercise:**

1. Creation of a child, orphan and Zombie process.
2. IPC using pipes.
3. IPC using message queues.
4. Simulation of FCFS process scheduling.
5. Simulation of ROUND ROBIN process scheduling.
6. Simulation of SJF process scheduling.
7. Demonstration of process synchronization using signals.
8. Demonstration of process synchronization using semaphores.
9. Deadlock avoidance using banker's algorithm.

## SEMESTER – V

CODE: UCST51

SYSTEM SOFTWARE

5HRS/ 4CREDITS

### Course Outcomes:

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the historical development of system software	Knowledge (Level – 1)
<b>CO2:</b> Understanding the difference between Operating Systems software and Application Systems software	Comprehension (Level – 2)
<b>CO3:</b> Knowing and applying the “boot” process	Application (Level – 3)
<b>CO4:</b> Working out the system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.	Synthesis (Level – 6)
<b>CO5:</b> Describing Microcomputer Structure & Memory management requirements	Synthesis (Level – 6)

### COURSE CONTENT

#### Unit – I

Overview of Microcomputer Structure and Operation-Execution of a Three-Instruction and Operation-Microprocessor Evolution and types-The 8086 Microprocessor Family-Overview-8086 Internal Architecture.

#### Unit- II

Family Assembly Language Programming:-Program Development Steps-Costructing the Machine Codes for 8086 Instructions-Writing Programs for Use with an Assembler-Assembly Language Program Development Tools.

#### Unit-III

System Software: Evolution Components of Programming System-Evolution of Operating System-Operating System User View Pont: Functions, Facilities, Macro Instructions & Features of Macro Facility.

Loader : Loader Schemes-Design of Absolute Loader, Direct Linking Loader-Recognizing Basic Elements-Recognizing Syntactic units and Interpreting Meaning-Intermediate Form-Storage Allocation-Code Generation.

#### Unit- IV

Operating system Introduction : Definition operating system objectives and functions – operating system as resource manager, operating system as a user/computer interface –

Evolution of operating system – Serial processing, batch processing, Multiprogramming, time sharing system.

Semaphore- dead lock – Principles – Prevention – Avoidance – Detection.

### **Unit-V**

Memory Management : Memory management requirements – Relocation, protection, sharing, Logical organization, Physical organization – Virtual memory – Locating and virtual memory, paging, segmentation, combined paging and segmentation – protection and sharing – operating system software – fetch policy , placement & replacement policy.

### **Text books**

1. “MicroProcessor and Interfacing”-Douglas.Hall Second Edition.
2. “System Programming by John J.Donovan-McGram Hill Publication.
3. Operating system by William Stallings.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Being aware of the functionalities, patterns, of operating system	Knowledge (Level – 1)
<b>CO2:</b> Understanding the concept of classification for the retrieval purposes	Comprehension (Level – 2)
<b>CO3:</b> Working out the applications of data mining	Application (Level – 3)
<b>CO4:</b> Discovering interesting patterns from large amounts of data to analyze and extract patterns to solve problems	Synthesis (Level – 6)
<b>CO5:</b> Designing and deploying appropriate classification techniques	Synthesis (Level – 6)

**COURSE CONTENT****UNIT-I**

Introduction - What is Data mining, Data mining – On kind of data - Data mining Functionalities –Classification of Data mining Systems - Data mining Task Primitives - Integration of Data Mining System - Major issues in Data Mining?

**UNIT-II**

Data Preprocessing : Why Preprocess the Data - Descriptive Data Summarization – Data Cleaning - Data Integration and Transformation - Data Reduction-Data Discretization and Concept Hierarchy Generation

**UNIT- III**

Data Warehouse and OLAP Technology An overview : Data Warehouse –A Multidimensional Data Model - Data Warehouse Architecture - Data Warehouse Implementation – From Data warehousing to Data Mining.

**UNIT-IV**

Mining – Frequent Patterns ,Associations Correlations : Basic Concepts - Efficient Scalable - Frequent Item set Mining methods - Mining Various Kinds of Association rules.

**UNIT-V**

Applications and Trends in Data mining : Data mining Applications –Data Mining System Products and Research Prototypes - Additional Themes on Data Mining - Social impact of Data mining - Trends in Data mining .

**Text Book:**

1. Data Mining (Concepts and Techniques) Second Ed : Jiawei Han and Michel Kamber  
Publishers : Morgan Kaufmann Publishers ( An imprint of Elsevier )

**Reference Books:**

- 1 Data Mining (Next Generation Challenges and Future Directions)  
Author : Karguta, Joshi, Sivakumar & Yesha Publishers : Printice Hall of India ( 2007 )
2. Data Mining (Practical Machine Learning Tools and Techniques (II Edition)  
Author : Ian H. Witten & Eibe Frank Publishers : Morgan Kaufmann Publishers (An imprint of Elsevier]
3. Data Warehousing, Data mining & OLAP (Edition 2004)  
Author: Alex Benson, Stephen V. Smith Publishers: Tata McGraw – Hill

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the processes of software development	Knowledge (Level – 1)
<b>CO2:</b> Comprehending and developing software design and modules for real time system	Comprehension (Level – 2)
<b>CO3:</b> Analyzing verification & validation techniques	Analysis (Level – 4)
<b>CO4:</b> Developing software design and modules for real time system	Synthesis (Level – 6)
<b>CO5:</b> Identifying, formulating and solving engineering problems	Synthesis (Level – 6)

**COURSE CONTENT****UNIT I**

Introduction to Software engineering some definitions – some size factors – quality to productivity factors – managerial Issue.

Planning a software project: defining the problems developing a solution strategy – planning on organization structure – other planning activities.

**UNIT II**

Software cost estimation: Software cost factors – Software cost estimation techniques – staffing – level estimation – estimative software maintenance costs.

**UNIT III**

Software requirements, definition: the software requirements specifications – formal specification techniques – language and processors for requirements specification.

**UNIT IV**

Software Design: fundamentals Descartes concepts – Modules and Modularizing criteria -Design techniques – detailed design considerations – real time and distributed system design – test plan – mile – stones walk through and inspection – design guide line.

**UNIT V**

Verification and validation techniques: Quality Assurance – static analysis – symbolic execution – unit testing and debugging system - testing formal verification.

Software maintenance: enhancing maintainability during developments managerial aspects of software maintenance – configuration management – sources code metrics – other maintenance tools and techniques.

**Text book:**

Software Engineering Concepts, 1985 Mc Graw Hill Book company by Richard E.Fairy,  
chapters 1-5, 8,9

**References books:**

1. Software Engineering: A practical Approach by Foger S.Pressman Mc Graw Hill International Books Company 1987 Edition.
2. Software Engineering-Mathur
3. Software Engineering-James

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the networking concepts and basic communication model	Knowledge (Level – 1)
<b>CO2:</b> Understanding the working principles of various application protocols	Comprehension (Level – 2)
<b>CO3:</b> Analyzing the basic terminology and Topology of the computer networking area	Analysis (Level – 4)
<b>CO4:</b> Evaluating the working principles of various application protocols	Evaluation (Level – 5)
<b>CO5:</b> Mastering the working with routing algorithms	Synthesis (Level – 6)

**COURSE CONTENT****UNIT I**

Introduction: User - Hardware – Software – Reference Models – Example Network – Example Data Communication service – Network Standardization.

**UNIT II**

Physical Layer: Transmission Media – Wireless Transmission – The Telephone system – Cellular radio – Communication satellites.\

**UNIT III**

Data Link Layer & Medium Access Layer – D.L.L.Design Issues – Elementary Data link protocols – Multiple Access Protocols – Ethernet, Token bus, Token ring standards.

**UNIT IV**

Networks Layer & Transport Layer: N.W.L. Design Issues – Routing - Algorithms – T.P.L. Design Issues – Elements of T.P.L.Protocol.

**UNIT V**

Application Layer: Network Security: Cryptography – Digital Signature - E-Mail Security – Web Security – Social Issues.

**Text Book**

1. Computer Networks by Andrew S.Tenenbaum, PHI, Third edition, 1996.

**Reference Book**

2. Computer Networks - Fourouzan

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the importance of Internet in multimedia	Knowledge (Level – 1)
<b>CO2:</b> Understanding Multimedia Architecture & Audio System	Comprehension (Level – 2)
<b>CO3:</b> Analyzing and designing Authoring Tools	Analysis (Level – 4)
<b>CO4:</b> Working out Graphics file and Application Formats	Application (Level – 3)
<b>CO5:</b> Trying out Graphics in Multimedia Applications.	Synthesis (Level – 6)

**COURSE CONTENT****UNIT I**

Introduction- Brief history of Multimedia – Resources for multimedia developers – Types of products – Multimedia Computer Architecture

**UNIT II**

Digital Audio – Characteristics of sound and Digital Audio – Digital Audio Systems – MIDI – Audio File Formats - Using Audio in Multimedia Applications – Digital Video – Background on Video – Characteristics of Digital Video – Digital Video Data Sizing – Video Capture and Playback Systems – Computer Animation – Using Digital Video in Multimedia Applications.

**UNIT – III**

Product Design – Building Blocks – Classes of products – Content Organizational Strategies – Story Boarding – Authoring Tool – Categories of Authoring Tools – Selecting the right Authoring paradigm

**UNIT IV**

Multimedia and the Internet – The Internet – HTM Land Web Authoring – Multimedia Considerations for the Internet – Design Considerations For Web Pages – Multimedia Development Team – Team Approach – Assembling a Multimedia Production Team.

**UNIT V**

Text – Elements of Text – Text Data Files – Using Text in Multimedia Applications – Hypertext – Graphics – Element of Graphics – Images and Color – Graphics file and

Application Formats – Obtaining Images for Multimedia Use – Using Graphics in Multimedia Applications.

**Text books:**

1. Multimedia Technology and Applications – David Hillman – 1998/Galgotia Publications Pvt. Ltd.,

**Reference books:**

1. Multimedia making it work – Tay Vaughan TMH 1996.

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Exploring Visual Basic's Integrated Development Environment (IDE)	Knowledge (Level – 1)
<b>CO2:</b> Understanding the concept of Visual Basic	Comprehension (Level – 2)
<b>CO3:</b> Applying fundamental skills in utilizing the tools of a visual environment such as command, menus, and toolbars.	Application (Level – 3)
<b>CO4:</b> Creating one and two dimensional arrays for sorting, calculating, and displaying of data.	Synthesis (Level – 6)
<b>CO5:</b> Demonstrating knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)	Synthesis (Level – 6)

**COURSE CONTENT****Exercise:**

1. Simple Arithmetic Operators(+,-,\*,/) Using text command boxes.
2. Manipulation of string and data functions.
3. Designing in calculator.
4. Magic square.
5. Number Puzzle, Picture Puzzle.
6. Using file, directory and drive list boxes o load a text file into a rich text box.
7. Function of Command Dialog Box( open, save color font, printer, help options)
8. Design a text editor using Rich Text Box.
9. Design a Screen Saver.
10. Animation of Picture.
11. Use list box, combo box to change the font, font size of the given text.
12. Display a popup menu in the form when you click the right mouse button.
13. Use graphical function to draw a picture and save it.
14. Data base Access using DAO, RDO, ODBC.
15. Compare the Scores of two cricket teams, by the use of graphics.
16. Design a Game(like solitaire).

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of the data from & files in python and develop Application using Pygame	Knowledge (Level – 1)
<b>CO2:</b> Developing a basic understanding of Python programming language.	Comprehension (Level – 2)
<b>CO3:</b> Solving problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language.	Application (Level – 3)
<b>CO4:</b> Becoming fluent in the use of procedural statements — assignments, conditional statements, loops, method calls — and arrays.	Synthesis (Level – 6)
<b>CO5:</b> Being able to design, code, and test small Python programs that meet requirements expressed in English. This includes a basic understanding of top-down design.	Synthesis (Level – 6)

**COURSE CONTENT****Exercise:**

1. Python Program to Print the Text.
2. Python Program to Add Two Numbers.
3. Python Program to find the square root.
4. Python Program to calculate the area of the triangle.
5. Python Program to convert Celsius to Fahrenheit.
6. Python Program to check prime number.
7. Python Program to check leap year
8. Python Program to display multiplication table.
9. Python Program to display Fibonacci series
10. Python Program to display factorial.

## SEMESTER VI

**CODE: UCST61 JAVA AND INTERNET PROGRAMMING 5 HRS/ 4 CREDITS**

### Course Outcomes:

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
CO1: Gaining knowledge of the Package and Interfaces	Knowledge (Level – 1)
CO2: Understanding the object-oriented paradigm in the Java programming language	Comprehension (Level – 2)
CO3: Applying Java in a variety of technologies and on different platforms	Application (Level – 3)
CO4: Managing Input Output in Files in Java	Synthesis (Level – 6)
CO5: Mastering Java script, Data types, Variables, Operators, and controlling windows.	Synthesis (Level – 6)

### COURSE CONTENT

#### UNIT I

Fundamentals of Object Oriented Programming - Java Evolution – overview of Java Language - Constants, Variables and Data types.

#### UNIT II

Operators and Expressions – Decision Making and Looping - Classes , Objects and Methods – Arrays, Strings and Vectors.

#### UNIT III

Interfaces : Multiple Inheritance – Packages :Putting classes together – Multithreaded Programming – Managing errors and Exception.

#### UNIT IV

Applet Programming – Graphics Programming – Introduction to AWT packages – Introduction to Swings - Managing Input Output in Files in Java.

#### UNIT V

Introduction to Java script – Data types – Variables – Operators, expressions – statements – functions, date month & type related objects, controlling windows.

#### Text Books

1. Introduction to Java Programming by E. Balagurusamy – Fifth Edition – McGrawHill Education Private Limited.
2. Java Complete Reference. Krishnamoorthy & Prabu, New Age Intl Publications

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Gaining knowledge of solving web client/server problems	Knowledge (Level – 1)
<b>CO2:</b> Comprehending the concept of Tables, Forms, Files, Basic Web server Controls	Comprehension (Level – 2)
<b>CO3:</b> Understanding the concepts of Tables, Forms, Files. Basic Web server Controls	Comprehension (Level – 2)
<b>CO4:</b> Describing the complete overview of HTML & Java Script	Synthesis (Level – 6)
<b>CO5:</b> Mastering Error handling. Security, Authentication, IP Address, Secure by SSL and Client Certificates	Synthesis (Level – 6)

**COURSE CONTENT****UNIT-I**

Internet Basic - Introduction to HTML - List - Creating Table - Linking document Frames - Graphics to HTML Doc - Style sheet - Style sheet basic - Add style to document - Creating Style sheet rules - Style sheet properties - Font - Text - List - Color and background color - Box - Display properties.

**UNIT-II**

ASP. NET Language Structure - Page Structure - Page event, Properties & Compiler Directives. HTML server controls - Anchor, Tables, Forms, Files. Basic Web server Controls- L.able, Textbox, Button, Image, Links, Check & Radio button, Hyperlink.

**UNIT-III**

Data List Web Server Controls - Check box list, Radio button list, Drop down list, List box, Data grid, Repeater.

**UNIT-IV**

Request and Response Objects, Cookies, Working with Data - OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced Issues - Email, Application Issues, Working with IIS and page Directives.

**UNIT-V**

Error handling. Security - Authentication, IP Address, Secure by SSL and Client Certificates

**Reference Books**

1. Deitel & Deitel, internet & World Wide Web How to program, Pearson Education
2. I. Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Pen CGI, BPB Publications, 2000
3. J. Jaworski, Mastering Javascript, BPB Publications, 1999
4. T. A. Powell, Complete Reference HTML (Third Edition),TMH, 2002
5. G. Buczek, ASP.NET Developers Guide, TMH, 2002

**CODE: UCST63    COMPUTER GRAPHICS    5 HRS/ 4 CREDITS**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining in-depth knowledge about the current 3D graphics	Knowledge (Level – 1)
<b>CO2:</b> Understanding computational development of graphics	Comprehension (Level – 2)
<b>CO3:</b> Analyzing the Line attribute & curve attribute	Analysis (Level – 4)
<b>CO4:</b> Designing animation with rotation, translation and scaling	Synthesis (Level – 6)
<b>CO5:</b> Working out 3D Display Techniques, 3D representation & 3D transformations.	Synthesis (Level – 6)

**COURSE CONTENT**

**UNIT I:** Overview of graphics systems: Video display devices – Raster-scan systems – Random-scan systems – Graphics monitors and workstation – Input devices – Hard-copy devices – Graphics software.

**UNIT II:** Output primitives: Points and lines – Line-drawing algorithms – DDA algorithm – Bresenham's line algorithm – Attributes of output primitives: Line attributes – Area-fill attributes – Character attributes – Bundled attributes.

**UNIT III:** Two-dimensional Geometric transformations: Basic transformations – Matrix representations – Composite transformations – Other transformations.

**UNIT IV:** Windowing and Clipping – Windowing concepts – Clipping Algorithms – Window to view port Transformations – segments – Interactive input methods – Physical input devices – logical classification of input devices – interactive picture construction techniques – input functions.

**UNIT V:** Three dimensional concepts – 3D Display Techniques – 3D representation – polygon and curved surface – 3D transformations.

**Text books:**

1. Computer Graphics C Version Second Edition, Donald Hearn and M.Pauline Baker, Pearson Education, 2006.
2. Donald Hearn and M.Pualine Baker "Computer Graphics", PHI , 2nd Edition.

**Reference books:**

1. William M.Neuman and Robert F Sproul "Principles of Interactive computer Graphics" , McGraw Hill International Edition, 2nd Edition.

2. Foley, van Dam, Feiner, and Hughes. Computer Graphics: Principles and Practice, 3rd edition in C.
3. Computer Graphics, Steven Harrington, McGraw-Hill

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge about basic Java language syntax and semantics	Knowledge (Level – 1)
<b>CO2:</b> Understanding the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.	Comprehension (Level – 2)
<b>CO3:</b> Analysing the principles of inheritance, packages and interfaces	Analysis (Level – 4)
<b>CO4:</b> Becoming capable of writing Java programs and using concepts such as variables, conditional and iterative execution methods etc.	Synthesis (Level – 6)
<b>CO5:</b> Developing software in the Java programming language	Synthesis (Level – 6)

**COURSE CONTENT**

**Exercise:**

1. Arrays and flow control statements.
2. Run time exception And I/O exception.
3. Multi- Threading.
4. Layout Management.
5. GUI Components (Labels, Check box, Menus, Text, etc.)
6. Event Handling (Focus Events, Key Events, Paint Events, Text Events, Mouse Events, Window Events, Etc.)
7. Animation and Images.
8. Java Applet.
9. Java files management methods.
10. Java Streams.
11. JDBC (Java Database Connectivity).
12. Arithmetic Operation Using Java Script
13. Prime Number Using Java Script
14. Find Largest Number in Array Using Java Script
15. Palindrome Using Java Script

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

COs	Bloom's Taxonomy Level
<b>CO1:</b> Understanding the role of mark-up languages in the workings of the web and web applications.	Comprehension (Level – 2)
<b>CO2:</b> Applying the knowledge of the internet and related internet concepts that are vital in understanding web application development	Application (Level – 3)
<b>CO3:</b> Analyzing the insights of internet programming to implement complete application over the web	Analysis (Level – 4)
<b>CO4:</b> Becoming capable of choosing the best technologies for solving web client/server problems.	Synthesis (Level – 6)
<b>CO5:</b> Automating the real time problems by developing & analyzing a web project and identifying its elements and attributes in comparison to traditional projects.	Synthesis (Level – 6)

**COURSE CONTENT****Exercise:****VB.NET**

1. Biggest of three numbers
2. Enumeration
3. Structure Exception handling
4. Display Welcome message
5. Display address of the college
6. Constructor
7. Destructor
8. Inheritance
9. Polymorphism
10. Find factorial and Fibonacci series using Interface

**ASP.NET**

1. Designing Login Form
2. Show the data in data grid
3. Program using request and response object
4. Program using Cookies
5. Create an advertisement using Ad rotator Control
6. Validator Control

7. String Functions
8. Program using system – data OLEDB
9. Payroll Detail in ASP.NET using Access as Background
10. Generate the Hotspots in the image

### **VB SCRIPT**

11. Greatest among three numbers using branching statements
12. Sorting
13. Fibonacci Series
14. Palindrome Checking
15. Looping through Arrays
16. Background color changing
17. Temperature color changing
18. Functions
19. Date and time function
20. String Function
21. Numeric Function
22. Quiz using Forms
23. Online Shopping

**CODE: UCSS64**

**COMPUTER GRAPHICS LAB 2 HOURS/ 2 CREDITS**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining in depth knowledge in developing the Computer graphics	Knowledge (Level – 1)
<b>CO2:</b> Understanding the basic principles of implementing computer graphics primitives	Comprehension (Level – 2)
<b>CO3:</b> Applying Translation Techniques	Application (Level – 3)
<b>CO4:</b> Becoming familiar with key algorithms for modelling and rendering graphical data.	Synthesis (Level – 6)
<b>CO5:</b> Developing the skill in computer graphics work	Synthesis (Level – 6)

**COURSE CONTENT**

**Exercise:**

1. Line Drawing Algorithm
2. Circle Drawing Algorithm
3. Bouncing Ball
4. Moving car with traffic light
5. Digital Clock
6. Solar System Simulation
7. Man Walking in the Rain
8. Rotating Wheel
9. Smiling Face Animation.
10. Moving Boat

**NON-MAJOR ELECTIVE (OFFERED BY PARENT DEPARTMENT)**

**HTML LAB**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge in using formatting tags	Knowledge (Level – 1)
<b>CO2:</b> Comprehending the method of inserting the Image file in web pages.	Comprehension (Level – 2)
<b>CO3:</b> Applying the procedure of navigating through web pages.	Application (Level – 3)
<b>CO4:</b> Becoming skilful in creating Web pages	Synthesis (Level – 6)
<b>CO5:</b> Becoming skilful in using basic HTM tags	Synthesis (Level – 6)

**COURSE CONTENT**

**HTML LAB**

1. Heading Tag
2. Formatting Tag
3. Ordered List
4. Unordered List
5. Definition List
6. Image
7. Anchor
8. Table
9. Frame
10. Forms

**NON MAJOR ELECTIVE / PHOTOSHOP LAB**  
**(OFFERED BY PARENT DEPARTMENT)**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge of the Photoshop Laboratory techniques	Knowledge (Level – 1)
<b>CO2:</b> Understanding the Layers and Masking	Comprehension (Level – 2)
<b>CO3:</b> Becoming skilful in navigating Photoshop's Workspace, Create & setup documents	Application (Level – 3)
<b>CO4:</b> Becoming capable of working with effects, filters and adjustments	Synthesis (Level – 6)
<b>CO5:</b> Gaining proficiency in a broad range of design skills pertaining to publication & web design.	Synthesis (Level – 6)

**COURSE CONTENT**

**Exercises**

Album preparation

1. Invitation Preparation
2. Wall Papers
3. Visiting Card
4. Background Changing and Removing
5. Wedding invitation Card
6. Cloning an Image
7. Flex Designing
8. Photo Editing
9. Book Cover

**NON MAJOR ELECTIVE / FUNDAMENTALS OF COMPUTER**  
**(OFFERED BY PARENT DEPARTMENT)**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge of the history of computers	Knowledge (Level – 1)
<b>CO2:</b> Getting a comprehensive knowledge of I/O Devices	Comprehension (Level – 2)
<b>CO3:</b> Analysing the types of software system	Analysis (Level – 4)
<b>CO4:</b> Becoming skilful in handling programming languages	Synthesis (Level – 6)
<b>CO5:</b> Becoming skilful in working with windows	Synthesis (Level – 6)

**COURSE CONTENT**

**UNIT I**

Introduction to computers – Generation of Computers – Types of Computers  
Comparison of Micro, Mini and mainframe computers – Advantages of Computer – characteristics of Computer – limitations of computer.

**UNIT II**

Block diagram of a Computer – input devices – output devices – storage devices – RAM – ROM – comparison b/w RAM and ROM – Secondary storage devices.

**UNIT III**

Types of Software – Operating systems – Need for an operating systems – functions of OS – popular operating systems – five generation of programming languages – packages.

**UNIT IV**

Binary number system – Binary Arithmetic operations (Addition, Subtraction, Multiplication, Division) – ASCII codes – Algorithms – Flow chart – Pseudo codes – steps in programming.

**UNIT V**

Definition – Features of networks – Network Topologies – LAN – WAN – MAN – Comparison between LAN and WAN – Introduction to Internet – History of internet uses of Internet – working with windows.

**Text Book:**

1. Fundamentals of IT – Alexis, Mathews Leon.

**NON MAJOR ELECTIVE / PRINCIPLES OF INFORMATION TECHNOLOGY  
(OFFERED BY PARENT DEPARTMENT)**

**Course Outcomes:**

After completion of the course, certain outcomes are expected from the learners.

<b>COs</b>	<b>Bloom's Taxonomy Level</b>
<b>CO1:</b> Gaining knowledge of Database	Knowledge (Level – 1)
<b>CO2:</b> Getting a comprehensive knowledge of Multimedia.	Comprehension (Level – 2)
<b>CO3:</b> Analysing the types of Internet services	Analysis (Level – 4)
<b>CO4:</b> Becoming skilful in handling Multimedia tools	Synthesis (Level – 6)
<b>CO5:</b> Becoming skilful in application of ICT tools	Synthesis (Level – 6)

**COURSE CONTENT**

**UNIT I**

Introduction – history of Information – Quality of Information – Information processing – Database – Characteristics of Data in a Database – DBMS – Types of DBMS – Data Normalization.

**UNIT II**

Internet and world wide web : Introduction – getting information on the internet – providing information on the internet – compiling information from the internet – internet access – basis – protocols – internet addressing – WWW – HTML – Web browsers – searching the web.

**UNIT III**

Multimedia Tools: Introduction – graphics effects and techniques – sound & music – video – multimedia authoring tools – virtual reality.

**UNIT IV**

Data warehouse & Data Mining: Introduction – advantages of data ware house – components – structure – uses – data mining introduction – advantages of data mining – technologies used in data mining.

**UNIT V**

Application of information technology: Computers in business and industry – computers in home – education and training – entertainment science and engineering and medicine.

**Text books:**

1. Fundamentals of information technology – Alexis Leon, Mathews Leon

**Reference Book:**

1. Advanced information technology – S. Jaiswal