BACHELOR OF SCIENCE
B.Sc. COMPUTER SCIENCE
UNDER CBCS (with effect from 2018-2019)

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OBJECTIVES

1. To produce employable workforce, that will have a breadth and depth of knowledge in the discipline of computer science.

2. To develop 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.

3. To develop skilled manpower in the various areas   like:

Data base management, Software Development, Computer-Languages, Software engineering,

Web based applications etc.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc. COMPUTER SCIENCE

PSO1: Understanding of the basics of computer science.

PSO2: Apply 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: Students have the opportunity to develop foundational skills to install and maintain computer networks, troubleshoot hardware and software problems.

PSO4: Design and implement software systems that meet specified design and performance requirements

PSO5: Apply advanced algorithmic and mathematical concepts to the design and analysis of software.

PSO6: Adhere to do higher studies or progress as an entrepreneur.

PSO7: Students gets the confidence to survive and get succeed in IT industry.

PSO8: Gets proficiency in the practice of computing, and to prepare them for continued professional development.

PSO9: Apply sound principles to the synthesis and analysis of computer systems

PSO10: Understands manage databases and develop web pages.

MOTHER TERESA WOMEN'S UNIVERSITY, KODAIKANAL

B.SC COMPUTER SCIENCE

ALLOCATION OF PAPERS AND CREDITS FOR UG PROGRAMME

EFFECT FROM - 2018-2019 ACADEMIC YEAR ONWARDS

I SEMESTER

S.NO	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	CIA	ESE	TOT
01.	ULTA11	Tamil	6	3	25	75	100
02.	ULEN11	English	6	3	25	75	100
03.	UCST11	Programming in C	5	4	25	75	100
04.	UCST12	Digital Principles &Computer Organization	5	4	25	75	100
05.	UCSA11	Discrete Mathematics	5	4	25	75	100
07.	UVAE11	Value Education	3	3	25	75	100
		Total	**30**	**21**			**600**

II SEMESTER

S.NO.	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	CIA	ESE	TOT
01.	ULTA22	Tamil	6	3	25	75	100
02.	ULEN22	English	6	3	25	75	100
03.	UCST21	Programming in C++	6	4	25	75	100
04.	UCSP21	Programming in C and C++Lab	5	4	25	75	100
05.	UCSA21	Web Designing Lab	5	4	25	75	100
06.	UEVS21	Environmental Studies	2	2	25	75	100
		Total	**30**	**20**			**600**

III SEMESTER

S.NO.	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	CIA	ESE	TOT
01.	ULTA33	Tamil	6	3	25	75	100
02.	ULEN33	English	6	3	25	75	100
03.	UCST31	Fundamentals of Data Structures	5	4	25	75	100
04.	UCSA32	Operation Research	5	4	25	75	100
05.	UCSE31	Fundamentals of Computer Algorithms	4	3	25	75	100
06.	UCSN31	NME 1	2	2	25	75	100
07.	UCSS31	Office Automation Lab	2	2	25	75	100
		Total	**30**	**21**			**700**

IV SEMESTER

S.NO.	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	CIA	ESE	TOT
01.	ULTA44	Tamil	6	3	25	75	100
02.	ULEN44	English	6	3	25	75	100
03.	UCST41	Relational Database Management Systems	4	4	25	75	100
04.	UCSP42	Relational Database Management Systems Lab	4	4	25	75	100
05.	UCSA42	DTP Lab	3	4	25	75	100
06.	UCSE42	Numerical Methods	3	3	25	75	100
07.	UCSN42	NME 2	2	2	25	75	100
08.	UCSS42	Linux\Unix Lab	2	2	25	75	100
		Total	**30**	**25**			**800**

V SEMESTER

S.NO.	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	CIA	ESE	TOT
01.	UCST51	System Software	5	4	25	75	100
02.	UCST52	Data Mining	5	4	25	75	100
03.	UCST53	Software Engineering	5	4	25	75	100
04.	UCST54	Computer Networks	5	4	25	75	100
05.	UCST55	Multimedia & its Application	5	4	25	75	100
06.	UCSE53	Visual Basic Lab	3	3	25	75	100
07.	UCSS53	Python Lab	2	2	25	75	100
		Total	**30**	**25**			**700**

VI SEMESTER

S.NO.	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	CIA	ESE	TOT
01.	UCST61	Java and Internet Programming	5	4	25	75	100
02.	UCST62	Web Technology	5	4	25	75	100
03.	UCST63	Computer Graphics	5	4	25	75	100
04.	UCSP63	Java And Internet Programming Lab	5	4	25	75	100
05.	UCSP64	Web Technology Lab	5	4	25	75	100
06.	UCSE64	Mini Project	3	3	25	75	100
07.	UCSS64	Computer Graphics Lab	2	2	25	75	100
08.	UEAS61	Extension Activities	-	3	25	75	100
		Total	**30**	**28**			**800**

	I	II	III	IV	V	VI	TOTAL
Total Credits	**21**	**20**	**21**	**25**	**25**	**28**	**140**
Total Marks	**600**	**600**	**700**	**800**	**700**	**800**	**4200**

SCHEME OF EXAMINATION

Internal (Theory) - **25**

    Test - **15**

    Attendance - **5**

    Assignment / Technical Quiz - **5**

    Total - **25**

External (Theory) - **75**

QUESTION PATTERN

1.	**PART A**	**10*1 Marks=10** (Objective Type/Multiple Choice) 2 Question from each Unit	**10**
2.	**PART B**	**5*4 Marks =20** (From each Unit Either or Choice)	**20**
3.	**PART C**	**3*15 Marks =45** (Open Choice) (Any three Question out of 5,onequestion from each unit)	**45**
		Total	**75**

The Internal assessment for Practical   : 25

The External assessment for Practical   : 75

CODE: UCST11 **PROGRAMMING IN C** **5 HOURS/ 4 CREDITS**

Objectives:

1. To understand and develop well-structured programs using C language.

2. To learn the basic data structures implementing through C language.

3. To deal with different memory allocation & input/output methods.

4. The Students can improve the Problem solving skills through computer programming.

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 HOURS/ 4 CREDITS

Objectives:

1. **To understand digital circuits and its functions.**
2. **To Design and to understand the functionality of the computer hardware with basic gates.**
3. **To Design digital circuits by simplifying the Boolean functions.**
4. **The Student can acquire knowledge about multiprocessor organization and parallel processing.**

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 – Asssociative – 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.

CODE: UCSA11 **DISCRETE MATHEMATICS** **5 HOURS/ 4 CREDITS**

Objectives:

1. **To understand problem solving method.**
2. **To Understand about Boolean algebra.**
3. **To Describes Relations.**
4. **Students completing this course will be able to evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.**

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 Martrices – Elementary Transformation – Rank of Matrix – Simultaneous Linear Equation – Eigen values and Eigen vectors – Cayley Hamiltion theorem.

UNIT V

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

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 HOURS/ 4 CREDITS

Objectives:

1. **To understand the Object Oriented Programming Concepts.**

2. **To demonstrate the use of virtual functions to implement polymorphism.**

3. **To Understand about Templates, Files and Exception Handling.**

4. **The Student can evaluate different algorithmic techniques and to write programs for developing simple applications using C++.**

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.

CODE: UCSP21   PROGRAMMING IN C and C++ LAB   5 HOURS/ 4 CREDITS

Objectives:

1. **To Understand and Apply Object oriented features and C++ concepts.**
2. **To Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.**
3. **To apply the concept of polymorphism and inheritance, exception handling and templates.**
4. **The Student can able to develop the applications using Console I/O and File I/O.**

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 HOURS/ 4 CREDITS

Objectives

1. **To understand about various HTML tags for designing a static web page.**
2. **To know about user interfaces, with graphics, textual components, and navigation systems.**
3. **To Design and apply XML to create a markup language for data and document centric application**
4. **The Student can gain Knowledge to create personal and/or business websites following current professional and/or industry standards.**

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

CODE: UCST31   FUNDAMENTALS OF DATA STRUCTURES   5 HOURS/ 4 CREDITS

Objectives:

1. **To Understand about Stack & Queue.**
2. **To understand about tree & its traversal techniques.**
3. **To Understand about Graphs and its components.**
4. **The Student can get the In-depth Knowledge in dealing with Data and its Structures.**

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.

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Text Book

1. Fundamentals of Data Structure by Ellis Horrowitz 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.

CODE: UCSA32   **OPERATION RESEARCH**   **5 HOURS/ 4 CREDITS**

Objectives:

1. **To understand the Mathematical Formation of L.P.P.**

2. **To Understand the Simplex Method & Artificial Variables.**

3. **To understand the transportation Problem and Assignment Problem.**

4. **The Student can Formulate and solve problems as networks and graphs using special solution algorithms.**

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. – Stack 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 HOURS/ 3CREDITS

Objectives:

1. **To write rigorous correctness proofs for algorithms.**
2. **To understand about the major algorithms and data structures.**
3. **To apply important algorithmic design paradigms and methods of analysis.**
4. **The Student can analyze the complexities of various problems in different domains**.

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 Books:

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

CODE: UCSS31   **OFFICE AUTOMATION**   **2 HOURS/ 2CREDITS**

Objectives

1. **To perform documentation.**
2. **To perform accounting operations.**
3. **To perform presentation skills.**
4. **The Student can capable to handle Basic Data Processing Work in Working Environment.**

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   4HOURS/ 4CREDITS

<u>Objectives:</u>

1. To understand the overview of Data Base systems & Data Models.
2. To modify and maintain the database structure.
3. To Understand about the PL/SQL / SQL.
4. The Students can able to handle the Database.

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.

CODE: UCSP42 RELATIONAL DATA BASE MANAGEMENT SYSTEMS LAB   4HOURS/ 4CREDITS

Objectives

1. **To become familiar with SQL fundamental Concepts.**
2. **To Apply Normalization techniques to normalize a database**
3. **To know the connectivity of databases with controls (DAO,ADO & RDO)**
4. **The Student can Gain a good understanding of the architecture and functioning of Database Management Systems as well as associated tools and techniques**.

Exercise:

PL/SQL

1. Program using conditional control, interactive controls & sequential controls.
2. Program using excepting 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.

CODE: UCSA42   DESK TOP PUBLISHING LAB (DTP)   3HOURS/ 4CREDITS

Objectives:

1. **To create and print a multi-page document which incorporates a variety of visual elements including text, graphics, columns and formatting other than the default settings, using advanced layout principles e.g. newsletter, brochure, advertisement or magazine.**

2. **To understand the difference between DTP and how it differs from word processing procedures**

3. **To acquire knowledge of typography e.g. font size, style, kerning, alignment, hyphenation and line spacing**

4. **The Student can develop the Visiting card,advertisement through various application**

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

CODE: UCSE42	NUMERICAL METHODS	3HOURS/ 3CREDITS

Objectives:

1. **To understand about Numerical Computations.**

2. **To understand about direct and iterative method**

3. **To know about Newton's Formulae, Gaussian Quadrature and Euler's method.**

4. **The students can work effectively in a broad range of numerical computations.**

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:

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

Objectives

1. **To run various UNIX commands on a standard UNIX/LINUX Operating system.**
2. **To do shell programming on UNIX OS.**
3. **To understand and handle UNIX system calls.**
4. **The Students can Master in various process management concepts including scheduling, synchronization and semaphores.**

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.

CODE: UCST51   **SYSTEM SOFTWARE**   **5HOURS/ 4CREDITS**

Objectives:

1. **To know about the historical development of system software**
2. **To know about the "boot" process.**
3. **To understand about the difference between Operating Systems software and Application Systems software.**
4. **The Students can gain the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.**

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.

CODE: UCST52   **DATA MINING**   **5HOURS/ 4CREDITS**

Objectives:

1. **To Aware about the Functionalities, patterns, of operating system.**

2. **To Design and deploy appropriate classification techniques.**

3. **To Use association rule mining for handling large data set.**

4. **The student can discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems.**

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

Author : Jiawei Han and Michelin 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

CODE: UCST53   **SOFTWARE ENGINEERING**   **5HOURS/ 4CREDITS**

Objectives:

1. **To Describe the processes of software development**
2. **To Develop software design and modules for real time system**
3. **To Analyze verification & validation techniques**
4. **The Student can identify, formulate, and solve engineering problems.**

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

CODE: UCST54   **COMPUTER NETWORKS**   **5HOURS/ 4CREDITS**

Objectives:

1. **To Understand networking concepts and basic communication model.**

2. **To Understand the working principles of various application protocols**

3. **To know about the Working with routing algorithms.**

4. **Familiarize the student with the basic terminology and Topology of the computer networking area.**

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

CODE: UCST55   MULTIMEDIA AND ITS APPLICATIONS   5HOURS/ 4CREDITS

Objectives:

1. **To understand Multimedia Architecture.**

2. **To Design Authoring Tools.**

3. **To Gain the importance of Internet in multimedia.**

4. **The Student can able to work with the current multimedia applications.**

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.

CODE: UCSE53　　　VISUAL BASIC LAB　　　3 HOURS/ 3 CREDITS

Objectives:

1. **To Explore Visual Basic's Integrated Development Environment (IDE).**
2. **To Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)**
3. **To create one and two dimensional arrays for sorting, calculating, and displaying of data.**
4. **The Student can develop a Graphical User Interface (GUI) based on problem description.**

Exercise:

1. Simple Arithmetic Operators(+,-,*,/) Uning 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).

Objectives:

1. **To develop a basic understanding of Python programming language.**

2. **Be fluent in the use of procedural statements — assignments, conditional statements, loops, method calls — and arrays.**

3. **Be able to design, code, and test small Python programs that meet requirements expressed in English. This includes a basic understanding of top-down design.**

4. **The Student can Solve problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language.**

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 HOURS/ 4 CREDITS

Objectives:

1. **To understand the object-oriented paradigm in the Java programming language.**
2. **To know about the Package and Interfaces.**
3. **To Understand about Applets.**
4. **The use of Java in a variety of technologies and on different platforms.**

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.
3. Krishnamoorthy & Prabu, New Age Intl Publications

Objectives:

1. **To understand the concept of Tables, Forms, Files, Basic Web server Controls.**

2. **Able to know Internet Basics and HTML.**

3. **To understand the concept of OLEDB connection class & Cookies.**

4. **Knowledge of solving web client/server problems.**

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 HOURS/ 4 CREDITS

Objectives:

1. **To Understand computational development of graphics**

2. **To Analyze the Line attribute & curve attribute**

3. **To Design animation with rotation, translation and scaling**

4. **The Student can gain in-depth knowledge about the current 3D graphics.**

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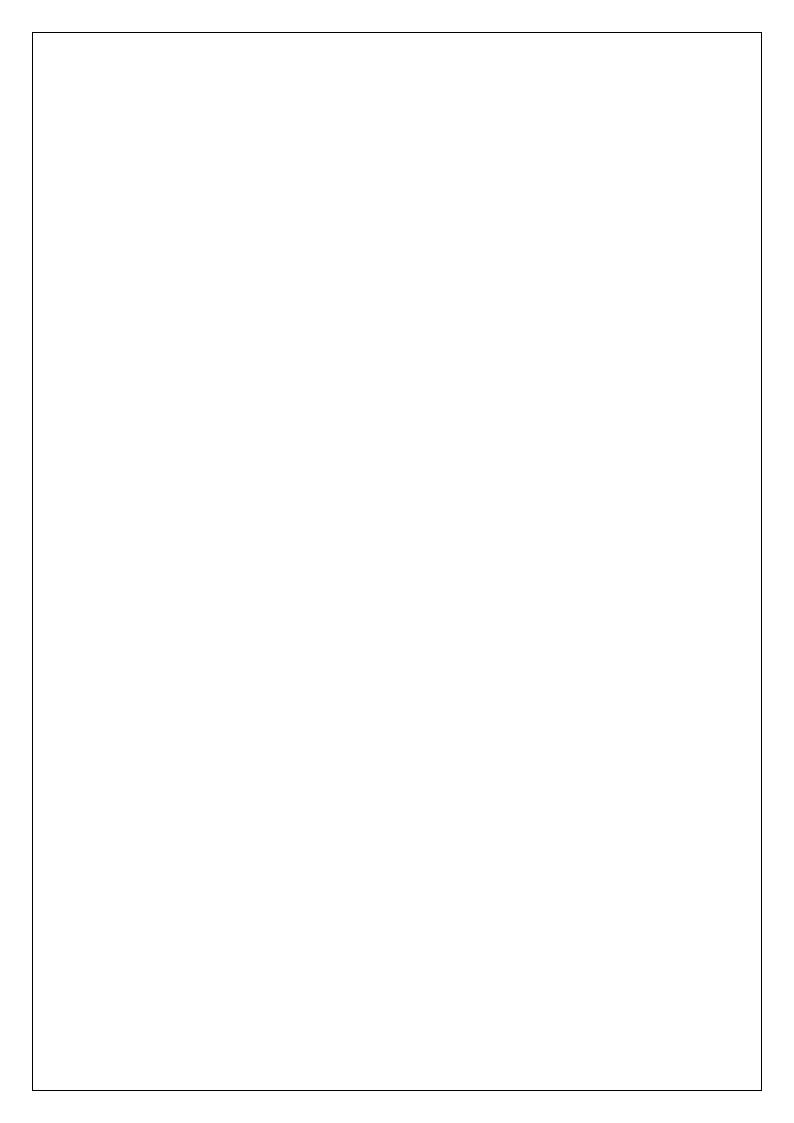
UNIT V: Three dimensional concepts – 3D Display Techniques – 3D representation – polygon and curved surface – 3D transformations.

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

CODE: UCSP63   JAVA AND INTERNET PROGRAMMING LAB   5 HOURS/ 4 CREDITS

Objectives:

1. **Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.**
2. **To understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.**
3. **To Understand the principles of inheritance, packages and interfaces**
4. **The Student can develop software in the Java programming language.**

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

CODE: UCSP64   WEB TECHNOLOGY LAB   5 HOURS/ 4 CREDITS

Objectives:

1. **Apply the knowledge of the internet and related internet concepts that are vital in understanding web application development and analyze the insights of internet programming to implement complete application over the web.**

2. **To understand, analyze and apply the role of markup languages in the workings of the web and web applications.**

3. **To automate the real time problems by developing & analyzing a web project and identify its elements and attributes in comparison to traditional projects.**

4. **The Students can choose best technologies for solving web client/server problems.**

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

<u>**Objectives**</u>

1. **To understand the basic principles of implementing computer graphics primitives.**

2. **Familiarity with key algorithms for modelling and rendering graphical data.**

3. **To Apply Translation Techniques.**

4. **The Student can get the in depth knowledge in developing the Computer graphics.**

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

Objectives:

1. **To Use formatting tags.**

2. **How to Insert the Image file in web pages.**

3. **How to navigate through web pages.**

4. **The Student can become Master in creating Web pages using basic HTM tags.**

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

PHOTOSHOP LAB

Objectives:

1. **Be able to navigate Photoshop's Workspace, Create & setup documents**

2. **To Understand about the Layers and Masking.**

3. **Be able to work with effects, filters and adjustments**

4. **The Students have a proficiency in a broad range of design skills pertaining to publication & web design.**

Exercises

1. Album preparation

2. Invitation Preparation

3. Wall Papers

4. Visiting Card

5. Background Changing and Removing

6. Wedding invitation Card

7. Cloning an Image

8. Flex Designing

9. Photo Editing

10. Book Cover

Objectives:

1. **To understand the history of computer.**

2. **Broad Understanding about I/O Devices.**

3. **Comprehensive Knowledge about Software.**

4. **The Student can Familiar in handling the computer.**

FUNDAMENTALS OF COMPUTER

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 (OFFERED BY PARENT DEPARTMENT)
PRINCIPLES OF INFORMATION TECHNOLOGY

Objectives:

1. **To understand the Database.**
2. **To Know about the Internet.**
3. **To gain the Deep Knowledge in Multimedia.**
4. **The Students can Familiar in handling the computer.**

UNIT I

Introduction – history of Information – Quality of Information – Information processing – Database – Character tics 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 – educations 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