PSG College of Arts & Science

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B.Sc. COMPUTER TECHNOLOGY

2017 - 2020

BSc COMPUTER TECHNOLOGY
SCHEME OF EXAMINATIONS
(For students admitted from 2015-16 & onwards)

CODE NO.	SUBJECT	EXAM DURA-TION (Hrs)	Max. Marks			Credit points
			CA	CE	Total	
First Semester						
Part–I						
14LAU01 15LAU01 14LAU01	Tamil – I OR Hindi – I OR French-I	3	25	75	100	3
Part – II						
14EU01	Communicative English – I Interpersonal Communication	3	25	75	100	3
Part – III						
15CTU01	Programming in C	3	25	75	100	3
15CTU02	Digital Electronics	3	25	75	100	3
15CTU03/ 14CMU03	Mathematics – I **(Allied – MA)**	3	25	75	100	4
15CTU04	LAB-I (C Programming Lab)	3	40	60	100	2
15CTU05	LAB-II (Office Automation Lab)	3	40	60	100	1
Second Semester						
Part – I						
14LAU02 15LAU02 14LAU02	Tamil – II OR Hindi – II OR French-II	3	25	75	100	3
Part – II						
14EU02	Communicative English – II Academic Communication	3	25	75	100	3
Part – III						
15CTU06	Object Oriented Programming using C++	3	25	75	100	3
15CTU07	Data Structures	3	25	75	100	3
15CTU08/ 14CMU08	Mathematics – II**(Allied- MA)**	3	25	75	100	4
15CTU09	LAB-III(Programming in C++ Lab)	3	40	60	100	2
15CTU10	LAB-IV (Data Structures using C Lab)	3	40	60	100	2
Part–IV						
14VEU01	Value Education	-	100	-	100	2

CODE NO.	SUBJECT	EXAM DURA-TION (Hrs)	Max. Marks			Credit points
			CA	CE	Total	
Third Semester						
	Part–III					
15CTU11	Programming in Java	3	25	75	100	3
15CTU12	Web Technology	3	25	75	100	3
15CTU13	Operating Systems	3	25	75	100	3
15CTU14	System Analysis and Design	-	100	-	100	3
15CTU15/ 14CMU15	Business Accounting**(Allied – CO)**	3	25	75	100	4
15CTU16	LAB-V (Java Programming Lab)	3	40	60	100	2
15CTU17	LAB-VI (Web Technology Lab)	3	40	60	100	2
15CTU18	LAB-VII (Project Designing Lab)	3	40	60	100	1
	Part – IV					
14ESU01	Environmental Studies	--	100	--	100	2
Fourth Semester						
	Part – III					
15CTU19	Dot Net Programming	3	25	75	100	3
15CTU20	Relational Database Management System	3	25	75	100	3
15CTU21	Computer Networks	3	25	75	100	3
15CTU22	Software Engineering	3	25	75	100	3
15CTU23/ 14CMU22	Statistics and Operations Research **(Allied – ST)**	3	25	75	100	4
15CTU24	Lab-VIII(Dot Net Programming Lab)	3	40	60	100	2
15CTU25	Lab-IX (RDBMS Lab)	3	40	60	100	2
15CTU26	Lab-X (Multimedia Lab)	3	40	60	100	1
	Part – IV					
14SBU01	**Skill Based Subject:** Internet Security	--	100	--	100	2

Placement Training to be completed in IV Semester (Mandatory) – 1 Credit

Four Weeks for Mini Project during Summer Vacation

CODE NO.	SUBJECT	EXAM DURA-TION (Hrs)	Max. Marks			Credit points
			CA	CE	Total	
Fifth Semester						
Part–III						
15CTU27	Mobile Application Development	3	25	75	100	3
15CTU28	Cloud Computing	3	25	75	100	3
15CTU29	Data Warehousing and Mining	--	100	--	100	3
15CTU30	Cryptography and Network Security	3	25	75	100	3
15CTU31A/ 15CTU31B	**Core Elective-I:** Embedded Systems OR Digital Image Processing	3	25	75	100	3
15CTU32	Lab-XI(Mobile Application Development Lab)	3	40	60	100	2
15CTU33	Lab-XII (Network Programming Lab)	3	40	60	100	2
15CTU34	Lab-XIII (Data Mining Tools Lab)	3	40	60	100	1
15CTU35	Mini Project	-	40	60	100	3
Part–IV						
14NME01	**Non-Major Elective(1):** EDC	--	100	--	100	2
14NME02	**Non-Major Elective(2):** General Awareness (On-line Test)	**1** ½	--	100	100	2
Sixth Semester						
Part – III						
15CTU36	Open Source Technologies	3	25	75	100	3
15CTU37	Software Testing	3	25	75	100	3
15CTU38A/ 15CTU38B	**Core Elective-II:** Client Server Technology OR Distributed Computing	3	25	75	100	3
15CTU39	Business Intelligence	3	25	75	100	3
15CTU40	Lab-XIV (Open Source Technologies Lab)	3	40	60	100	2
15CTU41	Lab-XV (Software Testing Lab)	3	40	60	100	1
15CTU42	Main Project	-	80	120	200	6
Total Credits						**136**

15CTU01
SEMESTER - I

PROGRAMMING IN C

OBJECTIVES: **Total Hours: 45**

To make the students proficient in:

- C language elements, Expressions, Functions, Pointers, Structures, File concepts.
- Solving the problem using C.

UNIT I **(9 Hours)**

INTRODUCTION TO C: The C Character Set – Identifiers and Keywords – Data Types – Constants – Variables and Arrays – Declarations – Expressions – Statements – Symbolic Constants.

OPERATORS AND EXPRESSIONS: Arithmetic Operators – Unary Operators – Relational and Logical Operators – Assignment Operators – The Conditional Operator.

UNIT II **(9 Hours)**

INPUT AND OUTPUT STATEMENTS: Single Character Input – Single Character Output – Entering Input Data – Writing Output Data – The Gets and Puts Function.

CONTROL STATEMENT: Branching – Looping – Nested Control Structures – Switch Statement – Break Statement – Continue Statement – Comma Operator – GO TO Statement.

UNIT III **(9 Hours)**

FUNCTIONS: Defining a Function – Accessing a Function – Function Prototypes – Passing Arguments to a Function – Recursion.

PROGRAM STRUCTURE: Storage Classes – Atomic Variables – Global Variables - Static Variables.

ARRAYS: Defining an Array – Passing Arrays to Functions – Multidimensional Arrays.

UNIT IV **(9 Hours)**

STRINGS: Defining a String – NULL Character – Initialization of Strings – Reading & Writing a String – Processing a String – Searching and Sorting of Strings.

POINTERS: Pointer Declarations – Passing Pointers to a Function – Dynamic Memory Allocation – Array of Pointers.

STRUCTURES AND UNIONS: Definition of Structures – User- Defined Data Types – Structures and Pointers – Passing Structures to Functions – Unions.

UNIT V **(9 Hours)**

FILE HANDLING: Opening and Closing a File – Reading and Writing a Data File – Processing a Data File – Unformatted Data Files - Concepts of Binary Files.

LOW LEVEL PROGRAMMING: Register Variables – Bitwise Operations – Bit Fields.

ADDITIONAL FEATURES OF C: Enumerations – Command Line Parameters.

TEXT BOOK:

1. Byron Gottfried**,** "Programming with C", McGraw Hill Education (India) Pvt Ltd., Third Edition, 2013.

REFERENCE BOOKS:

1.Yashavant Kanetkar "Let Us C" , BPB Publications, 9th Revised & Updated edition, Tata McGraw Hill,2013.

2. Venugopal K.R, Sudeep R.P, "Programming with C", Tata McGraw Hill, 2000.

15CTU02
SEMESTER-I

DIGITAL ELECTRONICS

OBJECTIVES: **Total Hours: 45**

Introducing digital Electronics to:

- Enable the students to have knowledge about the Fundamental building blocks of the digital systems.
- Understand the Digital circuits and Logic gates.

UNIT I (**9 Hours**)

NUMBER SYSTEMS AND CODES: Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Binary Addition – Binary Subtraction – Binary Multiplication and Division – Octal Numbers – Hexadecimal Numbers – Binary Codes – Error Detecting Codes – Error Correcting Codes.

UNIT II (**9 Hours**)

LOGIC GATES AND CIRCUITS: Boolean Algebra and Logic Gates – AND, OR, NOT, NAND, NOR, Exclusive OR and Exclusive OR Gates – Applications of XOR Gate – The Exclusive NOR Gate – Positive and Negative Logic– Integrated Circuits

UNIT III (**9 Hours)**

BOOLEAN ALGEBRA: – Fundamentals of Boolean Algebra – Boolean Functions – Minterms and Maxterms – Laws and Theorems of Boolean Algebra – DeMorgan's Theorem. Karnaugh Maps – Product of Sums Simplification – Don't Care Conditions – Overlapping Groups – Rolling the Map – Eliminating Redundant Groups.

UNIT IV (**9 Hours**)

COMBINATIONAL LOGIC CIRCUITS: Introduction – Adders – The Half Adder – The Full Adder –Subtractors – BCD Adder – Multiplexers – Demultiplexers – Decoders – Encoders – Floating Point Number System – Range of Stored Numbers.

UNIT V (**9 Hours**)

SEQUENTIAL LOGIC CIRCUITS: Flip Flops – RS Flip Flop – Clocked RS Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop – Triggering of Flip Flops – Master Slave Flip Flop – Conversion of D Flip Flop – Conversion of T Flip Flop – Transfer Circuit – Clock – Counters and Shift Registers: Counters – Asynchronous or Ripple Counter – Ring Counter – Twisted Ring Counter – State Diagrams and State Tables.

TEXT BOOK:

1. Dr. K. Meena,"Principles of Digital Electronics", PHI Learning Private Limited, New Delhi
2009.

REFERENCE BOOK:

1. V.K. Puri, "Digital Electronic circuits and Systems", Tata McGraw-Hill Publishing company limited, 2007.

14CMU03 **MATHEMATICS - I**

(For B.Sc. Computer Science (Day/Evening))

Total Hours:45

Unit I : Chapter III (Sections 3.2 to 3.4) **9hrs**

Matrices: Rank of matrices-Consistency and inconsistency-Eigen values and Eigen vectors.

Unit II Sections: (2.1 to 2.4, 4.5.1,4.5.3, 4.5.4, 4.6) **9hrs**

Differential equations: Second order Ordinary Differential Equations with constant coefficients - First order Partial Differential Equations(Standard I, III & IV) - Lagrange's Differential Equations.

Unit III: Chapter IV(Sections :4.1, 4.2, 4.6 & 4.7)(Problems only) **9hrs**

Numerical methods:

Solution of System of Simultaneous Algebraic Equations : Gauss Elimination Method - Gauss Jordan Method - Gauss Jacobi Iterative Method - Gauss Seidal Iterative Method.

Unit IV :Chapter V(Sections : 5.1 to 5.10, 6.1 to 6.5) (Problems only) **9hrs**

Numerical methods:

Difference table – Interpolation - Newton's Forward Interpolation formula - Newton's Backward Interpolation Formula - Construction of polynomials - Equidistant terms with one or more missing values.

Unit V (Sections: 9.1 to 9.3, 9.8 , 9.10) (Problems only) **9hrs**

Numerical methods:

Numerical Differentiation:

Newton's Forward and Newton's Backward formula to compute the Derivatives.

Numerical Integration:

The Trapezoidal rule - Simpson's $1/3^{rd}$ and $3/8^{th}$ rule.

Text Book:

1. S. Narayanan and T.K. Manickavachagam Pillai ,"Ancillary Mathematics" (For Unit I), S. Viswanathan (Printers & Publishers) Pvt Ltd, 2012

2. S. Narayanan and T.K. Manickavachagam Pillai, " Calculus" Volume III (For Unit II), S. Viswanathan (Printers & Publishers) Pvt Ltd, 2011

3. Dr. M.K. Venkataraman "Numerical methods in Science and Engineering" (For Unit III, IV,V), The National Publishing Company , 2013

15CTU04
SEMESTER – I

LAB-I (C PROGRAMMING LAB)

1. Students Mark Sheet preparation.
2. Convert decimal to binary and binary to decimal using menu.
3. Find the factorial of a given number using Recursion.
4. Reverse an array element.
5. Find the number of vowels, consonants, digits and white spaces in a given string.
6. Find the Length of a string using Pointers.
7. Prepare an Electricity Bill using Structure.
8. Read ‘n’ characters from a given text file from EOF position.
9. Create an Employee Information System using File Concept.
10. Find the sum of given numbers using Command line arguments.

15CTU05

SEMESTER -I
LAB-II (OFFICE AUTOMATION LAB)

MS-WORD

1. Mail Merge
2. Prepare a newspaper for two column format (Page which includes border, background, Pictures, Header and Footer)
3. Table of Contents & Document Template

MS-EXCEL

4. Analyze a sample Sales Information System using Pivot Table and Pivot Chart.
5. Prepare an employee Pay slip and Calculate the Net pay using the formula (BP: 8000, HRA: 12%, PF: 5%, DA: 2%, TA 2.5%)
6. Implement Grouping Concept in MS-Excel.

MS-ACCESS

7. Create a database for Student Information System and Create necessary Query, Forms, and Reports
8. Create a database for Library Information System and Create necessary Query, Forms, and Reports.

MS-POWER POINT

9. Prepare 10 to 15 slides on any of the topic of current IT trend with all necessary formats.
10. Prepare 10 slides for an Advertisement Company to exhibit its features.

15CTU06
SEMESTER – II

OBJECT ORIENTED PROGRAMMING USING C++

OBJECTIVES: **Total Hours: 45**

- To know about the object oriented programming concepts.
- To understand the concepts of Files, Error handling and Templates.

UNIT-I **(9 Hours)**

INTRODUCTION TO C++: Object Oriented Technology - Key Concepts of Object Oriented Programming - Advantages of OOP.

INPUT AND OUTPUT IN C++: Streams In C++ - Predefined Streams - Buffering - Stream Classes - Member Functions of Istream Class - Unformatted Console I/O Operations - Formatted Console I/O Operations - Manipulators - User-Defined Manipulators - Manipulators With Parameters. C++ Declarations - Types of Tokens - Data Types in C++ - Typecasting - Operators of C and C++ - Control Structures.

UNIT-II **(9 Hours)**

FUNCTIONS IN C++: Introduction - Parts of Function - Passing Arguments - Default Arguments -Const Arguments - Inline Functions - Library Functions.

CLASSES AND OBJECTS: Introduction - Classes in C++ - Declaring Objects - Defining Member Function - Characteristics of Member Function - Data Hiding or Encapsulation - Classes, Objects and Memory - Static Member Variables and Functions - Array of Objects - Friend Function - Local Classes - Overloading Member Function.

CONSTRUCTORS AND DESTRUCTORS: Introduction - Characteristics of Constructors and Destructors - Constructors with Argument - Copy Constructors - Destructors.

UNIT-III **(9 Hours)**

OPERATOR OVERLOADING AND TYPE CONVERSION: Introduction - Overloading Unary Operators - Overloading Binary Operators - Rules for Overloading Operators.

INHERITANCE: Types of Inheritance - Virtual Base Class - Object as Class Member - Overloading Member Function.

POINTERS AND ARRAYS: Introduction - Pointer Declaration - Void Pointers - Pointer to Class - this Pointer - Pointer to Members - Accessing Private Members with Pointers - Arrays - Characteristics of Arrays.

UNIT-IV **(9 Hours)**

C++ AND MEMORY: The New and Delete Operators - Dynamic Objects.

BINDING POLYMORPHISM AND VIRTUAL FUNCTIONS: Binding in C++ - Virtual Functions - Rules for Virtual Functions - Array of Pointers - Abstract Classes - Working of Virtual Functions.

APPLICATION WITH FILES: Introduction - File Stream Classes - Steps of File Operations - File Opening Modes - Sequential Read and Write Operations - Random Access Operation - Error Handling Functions - Command Line Arguments.

UNIT-V **(9 Hours)**

TEMPLATES: Definition of Class Template - Working of Function Templates - Function Templates with more Arguments.

EXCEPTION HANDLING: Principles of Exception Handling - The Keyword Try, Throw and Catch - Exception Handling Mechanism.

WORKING WITH STRINGS: Introduction - Declaring And Initializing String Objects - Handling String Objects - Comparing and Exchanging Strings.

TEXT BOOK:

1. Ashok N. Kamthane, "Object - Oriented Programming with C++", Dorling Kindersley Pvt Ltd, Seventh impression, 2009.

REFERENCE BOOKS:

1. Bruce Eckel, "Thinking in C++", Pearson education Inc, 2007.
2. Herbert Schildt, "C++: The Complete Reference", Tata McGraw Hill Publishing Company, 3rd edition, 2008.
3. Yashwant Kanetkar, "Let Us C++", BPB Publications, 2nd Edition.

15CTU07
SEMESTER – II

DATA STRUCTURES

OBJECTIVES: **Total Hours: 45**

- To study specific data structures such as static and dynamic lists, linear and non-linear data structures.
- To learn efficient searching and sorting techniques.

UNIT - I **(9 Hours)**

INTRODUCTION: Basic Terminology, Data Structure, Time and Space Complexity-Array-Structures-Pointers-Matrices-Sparse Matrices-Application – String Processing.

UNIT - II **(9 Hours)**

SORTING: Bubble Sort-Insertion Sort-Selection Sort-Merge Sort-Radix Sort-Quick Sort-Time and Space Complexity.
SEARCHING: Binary Search - Sequential Search - Index Search - Hashing.

UNIT - III **(9 Hours)**

LINKED LIST: Linked List - Dynamic Memory Allocation - Representation-Insertion, Deletion and Searching-Traversing in a List-Doubly Linked List.

UNIT - IV **(9 Hours)**

STACK: Stack-Linked Stack-Application-Expression-Infix-Prefix-Postfix-Conversion & Evaluation-Recursion.
QUEUE: Queue-Linked Queue-Circular Queue-Dequeue-Priority Queue-Application.

UNIT - V **(9 Hours)**

TREES: Binary Trees-Traversal - BST-Traversing - Insertion and Deletion of Nodes.
AVL SEARCH TREES: Introduction –Application of all Trees - Heap Sort.
GRAPH: Terminology-Representation-Traversing-Shortest Path Problem.

TEXT BOOK:

1. SeymourLipschutz – Schaum Series: "Theory and Problems of Data Structures", Tata McGraw Hill Publishing Company, New Delhi, 2002.

REFERENCE BOOKS:

1. Ellis Horowitz,SartajSahni," Fundamentals of Data Structures", Galgotia Publications, 2000.
2. Tremblay Sorenson, "An Introduction to Data Structures with Applications", Tata McGraw Hill Publishing Company, Second Edition, 2010.

14CMU08 **MATHEMATICS II**

(For B.Sc. Computer Science (Day/Evening))

Total Hours:45

UNIT-I: (12.1 to 12.12 except 12.4, 12.6 -12.10) **9hrs**

Mathematical logic: Introduction-propositional Calculus – Basic Logical Operations – Conditional Statements – Bi conditional Statements - Tautologies - Contradiction – Argument - Methods of proof .

UNIT-II: (3.1 to 3.7 & 3.11) **9hrs**

Relations: Introduction – Cartesian product of sets – Binary Relations - Set operations on Relations – Types of Relations – Partial order Relations – Equivalence Relation – Composition of Relations.

UNIT-III: (4.1 to 4.6) **9hrs**

Functions : Introduction – Definition and Notation of a function - Types of Functions – Invertible Functions – Composition of Functions –Identity Function.

UNIT-IV: (15.3 to 15.7) **9hrs**

Languages Grammar and Automata: Languages- Regular expressions and Regular Languages- Grammar- Finite-state Machine- Finite-state Automata

UNIT-V: (9.2 to 9.5, 9.8, 10.2 & 10.3) **9hrs**

Graph Theory : Introduction –Basic Terminology –Paths- Cycles and Connectivity- Subgraphs- Types of Graphs –Representation of Graphs in Computer Memory.
Trees : Definitions and properties of Trees- Binary trees .

Text Book:

J.K. Sharma ,"Discrete Mathematics" by Macmillan Publishers India Ltd – Third Edition 2011

15CTU09
SEMESTER – II

LAB - III (PROGRAMMING IN C++ LAB)

1. Prepare employee pay slip using class.
2. Implement the concept of inline and static functions.
3. Implement the concept of friend function by adding two complex numbers.
4. Create library management system using array of objects. Each object will have book name, author name, publisher name, no of copies and available copies.
5. Implement string manipulation using operator overloading.
6. Implement the concept of multiple constructors.
7. Prepare the student mark list using inheritance.
8. Implement virtual function to display the area of circle and area of triangle.
9. Implement templates to read a set of integers and floats and find average, min and max value.
10. Compare contents of two files using command line arguments.

15CTU10 **SEMESTER – II**

LAB - IV (DATA STRUCTURES USING C LAB)

1. Implement the concept of bubble sort.
2. Implement the concept of Insertion sort.
3. Implement the concept of Selection sort.
4. Implement the concept of Quick sort.
5. Search a given number using Binary search.
6. Search a given number using Linear search.
7. Implement stack operations using Linked list.
8. Implement Queue operations using Linked list.
9. Convert an Infix expression to Postfix expression.
10. Create a Binary search tree and traverse it using Function.

15CTU11
SEMESTER - III

PROGRAMMING IN JAVA

OBJECTIVES: **Total Hours: 45**

The students are introduced to

- How java implements Object Oriented Programming Concepts, Strings, Packages and Threads.
- Gain in depth understanding of Concurrent Programming

UNIT I (9 Hours)

AN OVERVIEW OF JAVA: Object-Oriented Programming - Lexical issues - Java class libraries.

Data types, Variables and Arrays - Simple types - Integer, Floating point types, Characters, Boolean - A closer look at Literals – Variables - Type conversion and Casting - Automatic type promotion in Expressions – Arrays.

Operators: Arithmetic operators, Bit wise operators, Relational operators, Boolean Logical operators, The Assignment operators, The ?: Operators - Operators precedence - Using parenthesis.

UNIT – II (9 Hours)

INTRODUCING CONTROL STATEMENTS, CLASSES: Control Statements: Selection Statements - Iteration Statements - Jump statements.

Class Fundamentals – Declaring objects – Assigning object reference variables – Introducing methods – Constructors – This keyword – Garbage collection – Finalize() method – stack class.

UNIT – III (9 Hours)

INTRODUCING STRING HANDLING: String Handling: The String Constructors - String Length - Special String Operations - Character extraction - String Comparison - Searching strings - Modifying a String.

UNIT – IV (9 Hours)

INHERITANCE, PACKAGES: Inheritance: Inheritance basis – Using Super – Creating a Multilevel Hierarchy – When Constructors are called – Method Overriding – Dynamic method dispatch – Using Abstract classes – Using final with Inheritance – The Object class.

Packages & Interfaces: Packages, Access protection – Importing packages – Interfaces.

UNIT – V (9 Hours)

EXCEPTION HANDLING, MULTITHREADING: Exception handling fundamentals - Exception types - Uncaught exceptions - Using Try and catch - Multiple catch clauses - Nested try statements - Throw - Throws - Finally - Java's built in Exceptions – Creating your own Exceptions – Using Exceptions.

Multithreaded Programming: The Java Thread method - Thread Priorities - Synchronization – Inter Thread communication – Suspending, Resuming and Stopping Threads.

TEXT BOOK:

1. Herbert Schildt, "The Complete Reference JAVA ™ 2", Mc-Graw Hill Limited, Fifth Edition, 2007.

REFERENCE BOOKS:

1. Patrick Naughton, Herbert Schildt, "Java 2: The Complete Reference", Mc-Graw Hill Limited, Fifth Edition, 2007.
2. Kogent Solutions Inc., "Java 6 Programming Black Book", Dream Tech Press, 2007 print.

15CTU12
SEMESTER- III

WEB TECHNOLOGY

OBJECTIVES: **Total Hours: 45**

- To have the basic knowledge about the mark up languages, style sheets and their tags.
- To impart the basics of scripting languages.

UNIT I **(10 Hours)**

INTRODUCTION –HTML Browsers- History of HTML–HTML Command tags-Basic tags-Ordered and Unordered lists – Creating a Link – Inserting Graphics – Scaling an image – Image Alignment – Creating banner – Adding horizontal rules – Wrapping text between two images – Ending text wrap. More on HTML-Creating Table – Putting background image – Working with forms – Working with frames.

UNIT II **(9 Hours)**

CASCADING STYLE SHEETS: Font attributes-Color and Background attributes-Text attributes – Border attributes-Margin attributes –Related attributes-List attributes. Class-Using the <SPAN> tag-External Style Sheets-Working with Java Script Style Sheets [JSSS]-Using the <DIV> tag-Layers-To move forward.

UNIT III **(8 Hours)**

INTRODUCTION TO ASP – Working with ASP Objects – Working with ASP Components – Data Access using DAO – Using Forms.

UNIT IV **(8 Hours)**

INTRODUCTION – Adding VB Script code to HTML-Adding a Script to your documents-Data type of VB –Getting the Message Across.

UNIT V **(10 Hours)**

JAVASCRIPT: Introduction – Operators – Assignments – Comparisons – Reserved Word – Reserved by Java – Words to be avoided - Browsers to use – Software Requirement – Starting with JavaScript – Using Quotes – Using Alert – Functions – Eval function.

USING STATEMENTS IN JAVASCRIPT – Working with Objects – Properties – Browser Objects – Date Object – Math Object – String Object – Defining Objects – Handling events in JavaScript – Window events – Listing of program to create form – Event object –Event simulation .

WORKING WITH FORMS – Form elements – User Actions – Windows and Frames – Window object – Frame object – Document Object – Navigator Object – Screen Object - Math Object – JavaScript Objects.

TEXT BOOKS:

1. Ramesh Bangia, "Web Technology" published by Firewall media, First Edition – 2006. (Unit I, IV, V)
2. Ivan Bayross, "Web Enabled Commercial Application Development" BPB publications -Third Edition. (Unit II)

3. John W.Gosney, “ASP Programming”, Premier Press Inc, 2002.(Unit III)

REFERENCE BOOK:

1. Steven Holzner, “HTML Black Book”, Dream tech Press, New Delhi, 2010.

15CTU13
SEMESTER – III

OPERATING SYSTEMS

OBJECTIVES: **Total Hours: 45**

To understand

- The basics of operating system and its structure
- Process management, deadlock management strategies.
- Memory management techniques & virtual memory concepts
- I/O Systems & File Systems

UNIT-I **(9 Hours)**

OVERVIEW OF OPERATING SYSTEM: Introduction to Operating systems -Computer system structures-Operating system structures.

PROCESS MANAGEMENT: Processes - CPU scheduling - Types of scheduling-Scheduling algorithms - Scheduling criteria - FIFO, Round robin, shortest process next, Priority scheduling, Multi level queue scheduling, multilevel feedback queue scheduling.

UNIT-II **(9 Hours)**

DEADLOCKS: Deadlocks – Prevention – Detection – Avoidance - Recovery from Deadlock.

UNIT-III **(9 Hours)**

MEMORY MANAGEMENT: Memory Management-requirements - Paging-Fixed, Dynamic partitioning - Segmentation - Segmentation with paging. Virtual Memory - Demand paging - Placement and replacement algorithms – Thrashing - Demand segmentation.

UNIT-IV **(9 Hours)**

STORAGE MANAGEMENT: I/O systems - Secondary storage structure - Disk structure - Disk scheduling - Disk management.

UNIT-V **(9 Hours)**

DISTRIBUTED FILE SYSTEMS: File system interface – File system implementation – File system structure - Free space management - File allocation methods.

TEXT BOOK:

1. Silberschatz Galvin, ”Operating System Concepts”, Prentice Hall of India, Sixth Edition, 2008.

REFERENCE BOOK:

1. Stallings W, Operating Systems, Prentice Hall of India, Fourth Edition, 2002.

15CTU14
SEMESTER – III

SYSTEM ANALYSIS AND DESIGN

OBJECTIVES: **Total Hours: 45**

To impart the knowledge of:

- System Development Life Cycle
- System Analysis, Design and Implementation

UNIT-I **(9 Hours)**

SYSTEMS CONCEPTS: The system concept – The elements of system – Types of Systems.

System Development Life Cycle – The role of system analyst.

Case Study : Develop a system for project analysis.

UNIT-II **(9 Hours)**

SYSTEMS ANALYSIS: Information gathering tools – The tools of Structured Analysis – Feasibility Study – Cost/Benefit Analysis.

Case Study : Design a system for cost estimation for a project.

UNIT-III **(9 Hours)**

SYSTEM DESIGN: Input/Output and Forms Design – File Organization and database design.

Case Study : Create a database for any application.

UNIT-IV **(9 Hours)**

SYSTEM IMPLEMENTATION: System Testing and Quality Assurance – Implementation and Software Maintenance –Primary Activities of a Maintenance Procedure-reducing Maintenance costs.

Case Study: Study on various types of testing.

UNIT-V **(9 Hours)**

Hardware/Software Selection and the computer contract – Project Scheduling and Software.

Case Study : Prepare a schedule for project development.

TEXT BOOK:

1. Elias M.Awad, “Systems Analysis and Design”, Galgotia Publications (Pvt) Ltd., 2010.

REFERENCE BOOK:

1. Alan Dennis, Barbara Haley Wixom, Roberta M.Roth, ”Systems Analysis and Design”, John Wiley & Sons, 4th Edition, 2010.

14CMU15 BUSINESS ACCOUNTING - (ALLIED) Semester III
(For B.Sc Computer Science A & B)

Learning Objective: To provide knowledge in the basic concepts of Accounting.

Hours

UNIT I - Double Entry Book Keeping **8**

Double Entry Book Keeping – Meaning – Accounting - Objectives Of Accounting, Uses And Limitations Of Accounting - Principles , Conventions And Concepts Of Accounting - Journal

UNIT II - Ledger & Trial Balance **10**

Ledger- Trial Balance – Preparation Of Trial Balance.

UNIT III - Subsidiary Books

Subsidiary Books: Sales Book – Purchases Book, Sales Return Book - Purchase Return Book.. **10**

UNIT IV - Final Accounts **10**

Final Accounts with adjustments – Preparation Of Trading And Profit And Loss Account – Balance Sheet.(simple problems only)

UNIT V - Cost Accounting **10**

Cost Accounting – Meaning – Scope, Objectives – Advantages And Limitations Of Cost Accounting. Difference Between Cost Accounting And Financial Accounting – Elements Of Cost Sheet – Preparation Of Cost Sheet.

Distribution of Marks: 80% Problems and 20% Theory .

Text Books

1. Grewal .T.S., "Double Entry Book keeping", S.Chand & Co.Ltd, New Delhi .
2. Jain & Narang., "Cost Accounting", Kalyani Publishers, New Delhi .

Reference Books

1. Gupta R.L., "Advanced Accountancy", Sultan Chand & Son's, New Delhi
2. Jain.S.P., Narang.K.L., "Advanced Accountancy", Kalyani Publishers, New Delhi

15CTU16
SEMESTER - III

LAB -V (JAVA PROGRAMMING LAB)

1. Calculate the students mark sheet and display the grade sheet along with the best student detail.
2. Find the average, sum, minimum and maximum of N numbers using user input.
3. Create a class to find out the area and perimeter of rectangle and box using super and this keywords.
4. Implement the concept of method overloading and constructor.
5. Perform various String operations using String class.
6. Perform string reverse operation using String Buffer class.
7. Create a user defined package named mypack in java and import it in circle class.
8. Implement multiple inheritance concepts in java using interface, You can choose your own example of a company or education institution or a general concept which requires the use of interfaces to solve a particular problem.
9. Prepare an employee pay slip for the employees and throw exceptions when
   (A)Basic pay<5000 and >30,000
   (B) Differences between Date of joining & Date of Birth is greater than 25
10. Illustrate the Multithreading concept.

15CTU17
SEMESTER – III

LAB-VI (WEB TECHNOLOGY LAB)

1. Design a web page using any 20 HTML tags.
2. Design a form using frames and insert pictures into the frames (provide hyperlinks to the pictures).
3. Design a registration form using DHTML for participating in a symposium.
4. Design HTML web pages, which make use of
   INPUT, META, SCRIPT, FORM, APPLET, BGSOUND, MAP
5. Design a form to accept student information and validate the following using VBScript:
   a) check the student name
      (Not to accept numbers and special characters except '.')
   b) check the date of birth
      (Difference between DOB & current date should be greater than 16)
6. Design a form for employee details and calculate the following (use JavaScript)
   a) Accept basic pay from the user
   b) Calculate net pay
7. Design a web page for an automobile showroom.
8. Design a webpage for a traveling agency.
9. Using JavaScript create a multiplication table.
10 .Using Java Script's Window and document objects and their properties and various methods like alert (), evaI (), Parselnt () etc. Methods to give the dynamic functionality to HTML web pages.

15CTU18
SEMESTER - III

LAB -VII (PROJECT DESIGNING LAB)

1. Identify a problem and assign a project name for the overall study. Write the problem or project description.
2. Collect the Requirement (Requirement Analysis) for the project. Conduct a feasibility study and document it.
3. Prepare the Gantt chart for overall development.
4. Create DFD or SFD, E-R diagram, Flowchart, Decisions tree, Decision table for the project &document it
5. Create necessary diagrams for your project using UML.
6. Prepare Cost and time Estimation for the project.

15CTU19 **SEMESTER-IV**

DOT NET PROGRAMMING

OBJECTIVES: **Total Hours: 45**

- Design, write and test C# programs.
- Implement programs using C# and classes from the .NET Framework.
- Implement simple GUI programs using Windows Forms.
- Use generic types, integrators, partial classes, and other new features in C#.
- To familiarize with ASP .NET and ADO .NET.

UNIT - I **(9 Hours)**

INTRODUCTION TO .NET PLATFORM: .NET – A Platform for Web Services - Building Blocks of .NET – Common Language Runtime – CLS and CTS – Framework Class Libraries – Microsoft Intermediate Languages – JIT Compilation – Garbage Collection – Unmanaged Code -.NET Framework Concepts.

UNIT - II **(9 Hours)**

C# LANGUAGE FUNDAMENTALS: Command Line Compiler – C# Types – Control Statements – Comments – Exception Handling – Working with Strings.

Object Oriented Programming in C#: Class, Objects – Structs – Enums – Interfaces – Access modifiers - Properties – Methods – Delegates and Events – Indexers – Attributes – Constructor and Destructor – Pointers and Unsafe Code.

UNIT – III **(8 Hours)**

WORKING WITH ASP.NET: The features of ASP.NET- ASP.NET Architecture -The anatomy of ASP.NET Pages – Introducing Web Forms - Using HTML Controls-Using Web controls – Web controls for displaying and formatting Data –Web controls for creating Buttons –Web controls for Inputting Text-Web controls for Selecting choices.

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UNIT –IV **(10 Hours)**

WEB CONTROLS FOR CREATING LISTS: Miscellaneous Basic Controls-Creating a simple ASP.Net Application –ASP.NET Page Directives –ASP.NET Rich Controls-Validation Controls – Data List Controls.-Page Navigation Options- Creating a Layout Using Master Pages - User Control - ASP.NET State Management- Databound Controls- Creating Virtual Directory & Web Application .

UNIT –V **(9 Hours)**

ACCESSING DATA WITH ADO.NET: Overview of Data Access on the Web-ADO.NET: The Next generation of Data–Access – ADO.NET Programming Objects and Architecture – Displaying Database Data- Programming with the Data List and Data grid controls – Working with the Dataset and Data list and Data grid controls – Working with the dataset and Data table objects – Maintaining Data Integrity with the Data relation class – Using Manual database Transactions – Working with typed Dataset Objects.

TEXT BOOKS:

1. Matt Telles and Kogent Solution Inc, "C# 2005 Programming Cover .NET 3.0 and 2.0 Black
Book ", Dreamtech Press 2007 (UNIT I).
2. Charles Wright, "C# Tips & Techniques", Tata McGraw Hill Publishing Company Ltd, 2002
(UNIT II).
3. Matt.J Crouch "ASP.NET and VB.NET Web Programming", Pearson Education 2002 (UNIT
III, IV and V).

REFERENCES

1. Vikas Gupta, ".NET Programming Course Kit – Covering C# .NET Framework VB.NET and
Asp.NET", Kogent Solutions Inc.
2. David. I. Schneider, "An Introduction to Programming Using VB.NET ", Prentice Hall of India pvt Ltd., 5th edition 2005.
1. Jeffery R. Shapiro, "The Complete Reference Visual Basic .NET", Tata McGraw Hill Publishing Company Ltd.
2. Mesbah Ahamed, Chris Garrett, Jerenny Faridoth Chair Payne, "ASP.NET Programming A
Developer Guide", Dreamtech Press 2002.
3. David Sceppa, "Microsoft ADO.NET", Microsoft Press 2005.

15CTU20
SEMESTER – IV

RELATIONAL DATABASE MANAGEMENT SYSTEM

OBJECTIVES: **Total Hours: 45**

To impart the knowledge of:

- Basics about the Databases and their structures.
- Various Constraints that can be applied to various Databases.
- Structured Query Language
- Relational databases, Oracle Databases, Stored Functions, Stored Procedures & Triggers.

UNIT- I **(8 Hours)**

INTRODUCTION: Purpose of Database Systems - View of Data - Database Languages - Relational Databases – Database Design – Data Storage and Querying - Transaction Management - Database Architecture – Data Mining and Information Retrieval – Specialty Databases – Database Users and Administrators.

UNIT-II **(10 Hours)**

RELATIONAL DATABASES: Structure of Relational Databases – Database Schema – Keys – Relational Query Languages – Relational Operations.

FORMAL RELATIONAL QUERY LANGUAGES: The Relational Algebra.

DATABASE DESIGN AND THE E-R MODEL: The Entity-Relationship Model – Constraints – Entity-Relationship Diagrams.

RELATIONAL DATABASE DESIGN: Atomic Domains and First Normal Form – Decomposition Using Functional Dependencies.

UNIT-III **(9 Hours)**

INTERACTIVE SQL: Invoking SQL * plus- Data manipulation in Database Management Systems – Oracle Data Types – Two Dimension Matrix Creation- Insertion of data into tables- Updating the contents of a table – Deletion operations – The many faces of the Select command- Modifying the structure of the table – Removing/Deleting/Dropping tables – Data constraints – Computations in expression lists used to select data – Logical operations – Range searching – Pattern matching – Oracle functions – Grouping data from tables in SQL – Manipulating dates in SQL – Joins – Sub queries.

UNIT-IV **(9 Hours)**

DML, Union, Intersect and Minus Clause - Indexes – Views – Sequences- Granting permissions- Revoking the permissions given – Creation of reports in SQL* plus.

PL/SQL: Introduction – Execution – PL/SQL syntax, Oracle transaction locks – Cursors.

STORED PROCEDURES: Introduction - Creating Stored Procedures – An application using a Procedure - Deleting a Stored Procedure.

UNIT-V **(9 Hours)**

STORED FUNCTIONS: Introduction - Advantages of Functions – Creating a Stored Function – An application using a Function – Deleting a Stored Function .

DATABASE TRIGGERS: Types of Triggers – Creating Triggers – Deleting Triggers.

TEXT BOOKS:

1. Silberschatz A, Korth H F, S.Sudarshan "Database System Concepts", McGraw-Hill Publishing Company, Sixth Edition, 2011. (Unit I & II)
2. Ivan BayRoss, "Commercial Application Development Using ORACLE Developer 2000", BPB Publication, New Delhi, 2007. (Unit III, IV & V)

REFERENCE BOOKS:

1. RamezElmasri, ShamkantB.Navathe, "Fundamentals of Database Systems", Pearson Education, Fifth Edition, 2008.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill Education, 2003.

15CTU21
SEMESTER – IV

COMPUTER NETWORKS

OBJECTIVES: **Total Hours: 45**

- To have the basic knowledge about different types of networks.
- To inculcate the knowledge about transmission of data.
- To impart the basic concepts like routers, switching & TCP/IP Protocol Suite.

UNIT-I (8 Hours)

INTRODUCTION: The uses of Computer Networks – Network Structures-Network Architectures-The OSI Reference Model – Services.

UNIT-II (9 Hours)

THE PHYSICAL LAYER : The Theoretical Basis for Data Communication-Transmission media-analog Transmission – Digital Transmission-Transmission and Switching- Integrated Services Digital Network(ISDN)-Terminal Handling.

UNIT-III (9 Hours)

THE MEDIUM ACCESS SUBLAYER : Local and Metropolitan Area Network-The ALOHA protocols Local area network-protocols.
THE DATA LINK LAYER : Data link layer design Issues- Error Detection and correction-Elementary Data Link Protocols.

UNIT-IV (9 Hours)

THE NETWORK LAYER : Network Layer design Issues- Routing Algorithms – Congestion Control Algorithms.
THE TRANSPORT LAYER: Transport layer design issues – connection Management.
THE SESSION LAYER: Session layer design issues – Remote procedure call.

UNIT-V (10 Hours)

THE PRESENTATION LAYER: Presentation layer design issues – Abstract Syntax Notation-Data compression Techniques – Cryptography.
THE APPLICATION LAYER: Application layer design issues – Files transfer-Access and management issues – Files transfer,Access and management- Electronic mail- Virtual terminals – other applications.

TEXT BOOK:

1. Andrew S. Tanenbaum, " Computer Networks", Prentice Hall of India Pvt. Ltd,New Delhi -1991.

REFERENCE BOOK:

1. P.Green – Computer Network Architectures and Protocols,Plenumy Press,1982.
2. Harry Katezen – An Introduction to Distributed Data Processing, a Petrocelli Book, Network/Princeton.

15CTU22
SEMESTER – IV

SOFTWARE ENGINEERING

OBJECTIVES: **Total Hours: 45**

- To know the development phases of a software life cycle.
- To have the depth knowledge about a software project.

UNIT - I **(8 Hours)**

INTRODUCTION TO SOFTWARE ENGINEERING: Some definitions – size factors - Quality and productivity factors - Managerial issues.

UNIT - II **(9 Hours)**

PLANNING A SOFTWARE PROJECT: Introduction – Defining the problem - planning the development process - The phased life cycle model - cost model - The prototype life cycle model - planning an organizational structure.

UNIT - III **(9 Hours)**

SOFTWARE COST ESTIMATION: Introduction - Software cost factors, software cost estimation techniques - Software requirements definition- Software requirement specification - Formal specification techniques - Language and processor for requirements specification.

UNIT - IV **(10 Hours)**

SOFTWARE DESIGN: Introduction - fundamental design concepts - modules and modularization criteria - Design notations - design techniques - Implementation issues - Structured coding techniques.

UNIT - V **(9 Hours)**

VERIFICATION AND VALIDATION TECHNIQUES: Quality assurance - walkthroughs and inspections - static analysis symbolic execution - system testing.

SOFTWARE MAINTENANCE: Managerial aspects of software maintenance - other maintenance tools and techniques.

TEXT BOOK:

1. Richard Fairley, "Software Engineering Concepts", Tata McGraw Hill, 38th reprint,2012

REFERENCE BOOKS:

1.Roger S. Pressman, "Software Engineering – A Practitioner's Approach", McGraw-Hill International Edition, 6th reprint, 2012.

14CMU22/14ITU15/14CAU03

STATISTICS AND OPERATIONS RESEARCH

Common for BCA, BSc (IT) & BSc (Computer Science)

Semester – I, III,IV

Objective:

To study about the fundamentals of statistics and operations research concepts.

UNIT I: (12 Hours)

Statistics – its applications in computers – Methods of collecting primary and secondary data and preparation of questionnaire – Classification and Tabulation of data – Diagrammatic and graphical representation of data- Bar, Pie, Histogram, Frequency polygon, Frequency curve and Ogives.

UNIT II: (12 Hours)

Measures of Central Tendency: Mean, Median, Mode – definition, Calculation for ungrouped and grouped data – merits and demerits – Absolute & Relative Measures of Dispersion: Range, QD, MD and SD- calculation for ungrouped and grouped data – merits and demerits – simple problems.

UNIT III: (12 Hours)

Time Series: Concept – estimation of trend by moving average method & method of least squares – Measuring seasonal variations by method of simple average & ratio – to – moving average method - simple problems.

UNIT IV: (12 Hours)

Linear Programming Problem: Definition, Canonical Form, Standard Form & Formation of LPP – Methods of solving LPP – Graphical method and Simplex Methods – simple problems.

UNIT V: (12 Hours)

Transportation Problem: Attaining IBFS using NWC Rule and Vogel's Approximation Methods (VAM).

Network Analysis – Construction of Networks – Concepts and problems in CPM & PERT models – simple problems.

Note: Proof and derivation are excluded. Theory carries 30 marks and problems carries 45 marks.

TEXT BOOKS:

1. "Business Statistics '' by S,P.Gupta & M.P.Gupta, SultanChand & Sons, New Delhi for Units I, II & III
2. Statistical methods: SP Gupta, Sultan Chand & Sons.
3. "Operations Research'', by Kanitswarup, P.K.Gupta & Manmohan, SultanChand & Sons, New Delhi for Units IV & V.

15CTU24 **SEMESTER– IV**

LAB-VIII (DOT NET PROGRAMMING LAB)

1. Generate the Temperature Conversion Application (Celsius to Fahrenheit, Fahrenheit to Celsius).
2. Implement scientific calculator using button controls.
3. Select image from list and display it in the picture box using Image control
4. Create a File Menu with Menu items New, Open, Save, Print and Exit & Edit Menu with Menu items Cut, Copy, Paste and Find and Undo using Menu Editor.
5. Add a Textbox entry to a Combo Box using button controls.
6. Create Digital Clock using Timer control.
7. Create an Application for Employee details to read and display the data using ADO. Net
8. Implement a Library Information System using ADO. Net.
9. Create an application for College Admission and test user input at the field level to determine if it is valid, and display messages to help the user to correct invalid data using ADO. Net.
10. Create a status bar to provide users with feedback about an application using text editor and validation control.

15CTU25 **SEMESTER – IV**

LAB-IX (RDBMS LAB)

1. Creation of tables using the SQL statement with constraints and do the following Operations:
    a) Insert
    b) Delete
    c) Alter
    d) Drop
2. Generate queries using the following statements
    a) Select
    b) Update
    c) Insert from already existing table
3. Generate queries using the following:
    a) Sub queries
    b) Joins
    c) Nested Queries
4. Generate queries using the following:
    a) Date functions
    b) Library functions
5. Generate queries using the following:
    a) Group by statement
    b) Order by statement
6. Creation of Report for Mark Sheet Preparation.

PL/SQL

7. Calculate total and percentage of marks of the students in four subjects.
8. Create a Row trigger to insert the existing values of the salary table into a new table when the salary table is updated.
9. Create a Stored function that accepts the department number and returns the total Salary of the department to the calling program and display it.
10. Create a cursor for manipulating Employee details.

15CTU26
SEMESTER – IV

LAB-X (MULTIMEDIA LAB)

1. Create various Shapes such as Square, Rectangle and Triangle using Flash
2. Change a Shape from one form to other Form using Animation.
3. Create any Animal and make it to Run with the help of Key frame Animations.
4. Draw a Parrot with various Tools available in flash and make it to Fly with Key Frame Animations.
5. Create shining Stars with the help of Movie Clips.
6. Create a photo Album which should contain different Pictures and make the Pictures to scroll by using Buttons.
7. Create a Box and make it to Rotate in 3 Dimensions with the help of shape Animation.
8. Create Morphing between two Images.
9. Create a simple Game with the help of Action Script.
10. Give Password to a Website with the help of Action Script

15CTU27

SEMESTER- V

MOBILE APPLICATION DEVELOPMENT

OBJECTIVES: **Total Hours: 45**

- To be exposed to technology and business trends impacting mobile applications
- To be competent with the characterization and architecture of mobile applications.
- To be competent with understanding enterprise scale requirements of mobile applications

UNIT I **(9 Hours)**

WIRELESS COMMUNICATION FUNDAMENTALS : Introduction - Wireless transmission - Frequencies for Radio transmission - Signals - Antennas – Signal Propagation - Multiplexing - Modulations - Spread spectrum - MAC - SDMA - FDMA - TDMA - CDMA - Cellular Wireless Networks.

UNIT II **(9 Hours)**

TELECOMMUNICATION SYSTEMS : GSM - System Architecture - Protocols - Connection Establishment - Frequency Allocation - Routing - Handover - Security – GPRS.

UNIT III **(9 Hours)**

BROADCAST SYSTEMS : Overview -Cyclical repetition of data - Digital audio broadcasting -Multi-media object transfer protocol - Digital video broadcasting - DVB data broadcasting - DVB for high-speed internet access - Convergence of broadcasting and mobile communications.

UNIT IV **(9 Hours)**

IEEE 802.11: System architecture - Protocol architecture - Physical layer - Medium access control layer - MAC management.

BLUETOOTH: User scenarios - Architecture - Radio layer - Baseband layer - Link manager protocol - L2CAP - Security.

UNIT V **(9 Hours)**

MOBILE NETWORK LAYER : Mobile IP - Goals, assumptions and requirements - Entities and terminology - IP packet delivery - Agent discovery - Registration - Tunneling and encapsulation - Optimizations - Reverse tunneling - IPv6 - IP micro-mobility support - Dynamic host configuration protocol.

MOBILE TRANSPORT LAYER : Traditional TCP - Congestion control - Slow start --Fast retransmit/fast recovery - Implications of mobility - Classical TCP improvements - Indirect TCP - Snooping TCP - Mobile.

TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", 2nd Edition, Prentice Hall of India / Pearson Education, 2003.

REFERENCE BOOKS:

1. William Stallings, "Wireless Communications and Networks", 2nd Edition, Prentice Hall of India,
Pearson Education, 2004.(Unit III)
2. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", Pearson Education, 2003.
3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile
Computing", Springer, New York, 2003.
4. C. K. Toh, "Ad Hoc Mobile Wireless Networks", Prentice Hall Inc., 2002.

15CTU28
SEMESTER-V

CLOUD COMPUTING

OBJECTIVES: **Total Hours: 45**

- Understand the fundamental concepts in the study of cloud computing and its creation, acquisition and representation.
- Know the core concepts, methods and usage of cloud computing services.
- Understand various evaluation techniques and exploring cloud computing in various applications.

UNIT – I **(9 Hours)**

INTRODUCTION: Cloud Computing: Introduction - From Collaboration to Cloud - Working of Cloud Computing - Pros and Cons – Benefits - Developing Cloud Computing Services – Cloud Service Development - Discovering Cloud Services.

UNIT – II **(9 Hours)**

CLOUD COMPUTING FOR EVERYONE: Centralizing Email Communications - Cloud Computing for Community - Collaborating on Schedules - Collaborating on Group Projects and Events – Cloud Computing for Corporation – Managing Schedules - Managing Projects – Presenting on Road.

UNIT – III **(9 Hours)**

USING CLOUD SERVICES: Collaborating on Calendars - Schedules and Task Management - Exploring on Line Scheduling and Planning - Collaborating on Event Management Collaborating on Contact Management - Collaborating on Project Management - Collaborating on Word Processing – Spreadsheets and Databases.

UNIT – IV **(9 Hours)**

STORING AND SHARING: Understanding Cloud Storage - Evaluating on Line File Storage - Exploring on Line Book Marking Services - Exploring on Line Photo Editing Applications – Exploring Photo Sharing Communities - Controlling it with Web Based Desktops.

UNIT – V **(9 Hours)**

OUTSIDE THE CLOUD: Evaluating Web Mail Services, Evaluating Instant Messaging - Evaluating Web Conference Tools - Creating Groups on Social Networks - Evaluating Online Groupware - Collaborating via Blogs and Wikis.

TEXT BOOK:

1. Michael Miller, “Cloud Computing”, Pearson Education, New Delhi, 2009.

REFERENCE BOOK:

1. Toby Velte, Anthony Velte, Toby J. Velte , “Cloud Computing - A Practical Approach”, McGraw-Hill, 2009.

15CTU29

SEMESTER- V

DATA WAREHOUSING AND MINING

OBJECTIVES: **Total Hours: 45**

- To find the needles hidden in the haystacks of data.
- To learn how to use advanced Mining techniques to meet the business objectives.

UNIT - I **(9 Hours)**

DATA WAREHOUSING: Introduction – Data Warehouse – Definition – Multidimensional Data Model – OLAP Operations – Warehouse Schema – Data Warehousing Architecture – Warehouse Server – Metadata – OLAP Engine – Data Warehouse Backend Process.

UNIT – II **(9 Hours)**

DATA MINING: Introduction – What is Data Mining – Definition – KDD vs. Data mining – DBMS vs. DM – Other Related Areas – DM Techniques – Other Mining Problems – DM Application Areas – DM applications – Case Study.

ASSOCIATION RULE: Introduction – Methods of Discover Association Rules – A Priory Algorithm – Pincer Search Algorithm

UNIT – III **(9 Hours)**

CLUSTERING TECHNIQUES: Introduction – Clustering Paradigms – Partitioning Algorithm – k-medoid Algorithm – CLARA – CLARANS – Hierarchical Clustering – DBSCAN.

DECISION TREES: Introduction – Tree Construction Principle – Decision Tree Construction Algorithm.

UNIT – IV **(9 Hours)**

ROUGH SET THEORY: Introduction – Definition – Reduct – Propositional Reasoning and PIAP to Compute Reducts – Types of Reducts – Rule Extraction – Decision Tree – Rough Set and Fuzzy Set – Granular Computing.

UNIT - V **(9 Hours)**

WEBMINING: Introduction – Web Mining – Web Content Mining – Web Structure Mining – Web Usage Mining – Text Mining – Unstructured Text – Episode Rule Discovery for Texts – Hierarchy of Categories – Text Clustering.

TEMPORAL AND SPATIAL DATA MINING: Introduction – Temporal Data Mining – Temporal Association Rules – Sequence Mining – The GSP Algorithm – SPADE.

TEXT BOOK:

1. Arun K Pujari , "DATAMINING TECHNIQUES" Second Edition, Universities Press, First Reprint 2011.

REFERENCE BOOKS:

1. Jiawei Han, MichelineKamber and JianPei, “Data Minng- Concepts and Techniques” Third Edition, Elsevier Publishers, 2012.
2. Margaret H. Dunham, “Data Mining-Introductory and Advanced Topics” Pearson Education, Fourth Impression 2010.

15CTU30

SEMESTER -V

CRYPTOGRAPHY AND NETWORK SECURITY

OBJECTIVES: **Total Hours: 45**

The goal of this paper is

- To Introduce the Ideas of Information System Security
- To Impart the Security Protocol Structures
- To Enable the Students Know Secure Data Transmission Techniques

UNIT-I **(9 Hours)**

INTRODUCTION: Attacks, Services& mechanism- Security Attacks- Security Service- a Model for Internetwork Security- Internet Standards & RFCs. Conventional Encryption Message Confidentiality- Conventional Encryption Principles- Conventional Encryption Algorithms.

UNIT-II **(9 Hours)**

PUBLIC KEY CRYPTOGRAPHY & MESSAGE AUTHENTICATION: Approaches to Message Authentication – Secure Hash Function & HMAC– Public Key Cryptography Principles & Algorithms- Digital Signature- Key Management.

UNIT-III **(9 Hours)**

AUTHENTICATION APPLICATION: Kerberos- x.509 Directory authentication service.
ELECTRONIC MAIL SECURITY: Pretty Good Privacy- S/MIME.
IPSECURITY: IP Security Overview & Architecture- Authentication.

UNIT-IV **(9 Hours)**

WEBSECURITY: Web Security Requirements– Secure Sockets Layers & Transport Layer Security– Secure Electronic Transaction.
NETWORK MANAGEMENT SECURITY: Basic Concepts of SNMP- SNMPV1 Community Facility- SNMPV3.

UNIT-V **(9 Hours)**

INTRUDERS & VIRUS: Intruders - Viruses & Related Threats.
FIREWALLS: Firewall Design Principles- Trusted Systems.

TEXT BOOK:

1. Stallings W, "Network Security Essentials", Pearson Education Asia, Fifth Edition, 2010.

REFERENCE BOOK:

1. Andrew S. Tanenbaum, "Computer Networks", Prentice Hall of India, Fifth Edition, 2010.

15CTU31A **CORE ELECTIVE-I**

SEMESTER - V

EMBEDDED SYSTEMS

OBJECTIVES: **Total Hours: 45**

- To facilitate the acquisition of the foundation skills required
- To improve student's understanding of the basic concepts and
- Provide the requisite awareness and knowledge to understand key concepts

UNIT-I **(9 Hours)**

INTRODUCTION: Embedded Systems and General Purpose Computer Systems, History , Classifications, Applications and Purpose of Embedded Systems **CORE OF EMBEDDED SYSTEMS**: Microprocessors and Microcontrollers, RISC and CISC Controllers, Big Endian and Little Endian Processors, Application Specific ICs, Programmable Logic Devices, COTS, Sensors and Actuators, Communication Interface, Embedded Firmware, Other System Components, PCB and Passive Components.

UNIT-II **(9 Hours)**

CHARACTERISTICS AND QUALITY ATTRIBUTES OF EMBEDDED SYSTEMS: Characteristics, Operational and Non-Operational Quality Attributes, Application Specific Embedded System – Washing Machine, Domain Specific - Automotive.

UNIT-III **(9 Hours)**

DESIGNING EMBEDDED SYSTEMS WITH 8 BIT MICROCONTROLLER 8051: Factors to be Considered in Selecting a Controller- Designing with 8051: The 8051 Architecture- The Memory Organization- Registers- Oscillator Unit- Interrupts- The 8051 Interrupt System- Timer Units- Serial Port- Reset Circuitry.

UNIT-IV **(9 Hours)**

PROGRAMMING THE 8051 MICROCONTROLLER AND HARDWARE SOFTWARE CO-DESIGN AND PROGRAM MODELING: Different Addressing Modes Supported by 8051- The 8051 Instruction Set.

HARDWARE SOFTWARE CO-DESIGN AND PROGRAM MODELING: Fundamental Issues in Hardware Software co-design- Computational Models in Embedded System- Introduction to Unified Modeling Language(UML)- Hardware Software Trade- offs.

UNIT-V **(9 Hours)**

DESIGN AND DEVELOPMENT: EMBEDDED SYSTEM DEVELOPMENT ENVIRONMENT: IDE, Types of File Generated on Cross Compilation, Disassembler/ Decompiler, Simulator, Emulator and Debugging, Embedded Product Development Life-Cycle, Trends in Embedded Industry**.**

TEXT BOOK:

1. Shibu K V,"Introduction to Embedded Systems", Tata McGraw-Hill publications,2009

REFERENCE BOOKS:

1. Rajkamal, "Embedded Systems ", Tata McGraw-Hill publications, 2003

2. Michael Barr, O'Reilly,"Programming Embedded Systems in C and C++", First Edition

January.

15CTU31B CORE ELECTIVE-I

SEMESTER - V

DIGITAL IMAGE PROCESSING

OBJECTIVES: **Total Hours: 45**

- To learn the fundamentals of digital image processing and algorithms.
- To understand transformations and spatial operations in digital image processing.
- To implement basic image processing algorithms.

UNIT I (9 Hours)

INTRODUCTION TO IMAGING TECHNOLOGY: Introduction – Digital Image Representation.

BASIC DIGITAL IMAGE PROCESSING: Fundamental Steps in Digital Image Processing – Grey Level Transformation – Histogram Equalization – Multi Image Operations – Spatially Dependent Transformations – Transformations – Image Enhancement Techniques – Image Restoration.

UNIT II (9 Hours)

SEGMENTATION AND EDGE DETECTION: Introduction – Region Operations – Basic Edge Detection – Second Order Detection – Pyramid Edge Detection – Crack Edge Detection – Edge Following – Thresholding.

UNIT III (9 Hours)

IMAGE COMPRESSION: Introduction – Principle of Compression – Types of Compression – Run Length Encoding – Huffman Coding – Modified Huffman Coding – Modified READ – LZW – Arithmetic Coding – JPEG – Other State-of-the-Art Image Compression.

UNIT IV (9 Hours)

PATTERN RECOGNITION: Introduction – System Component – Complexity of Pattern Recognition – Object Representation – Feature Detection – Recognition Strategies – Verification.

UNIT V (9 Hours)

APPLICATIONS OF IMAGE PROCESSING: Finger Prints – Face Recognition – Iris Recognition – Speaker Recognition – Digital Watermarking for Images – Medical Image Processing – Application of Image Processing in Remote Sensing.

TEXT BOOKS:

1. M. Anji Reddy and Y. Hari Shankar, "Digital Image Processing", BS Publications, 2006. (Unit I – Unit IV)
2. Madhuri A. Joshi, "Digital Image Processing", Prentice Hall of India, 2006. (Unit - V)

REFERENCE BOOK:

1. AbhishakYadav and PoonamYadav, “Digital Image Processing”, University Science Press, First Edition, 2009.

15CTU32

SEMESTER- V

LAB – XI (MOBILE APPLICATION DEVELOPMENT LAB)

1. Develop an application using Android Development Environment
2. Develop an application using Generic UI Development
3. Storing and Retrieving Data using SQLite.
4. Notifications and Alarms using Android Development Environment
5. Camera and Media player using Android Development Environment
6. Location Based Services (Map based Activity and Proximity alerts)
7. Communications via Network and the Web (SMS and MMS)
8. Graphics and Animation (Different Shapes and Animation)
9. Develop a Game (Shooting bubbles, shooting arrows, Simple snake game).

15CTU33

SEMESTER- V

LAB-XII (NETWORK PROGRAMMING LAB)

1. Write a program to find IP address for the given host and for URL address.

2. Write a program to transmit a message between devices using connection oriented protocols.

3. Implement the concept of transmits a message through protocols.

4. Write a program to chat between different devices.

5. Write a program to list out the files with the given format from a folder.

6. Write a program to detect errors in a data, parity check method.

7. Write a program to correct errors using error correction method.

8. Implement file transfer operations.

15CTU34

SEMESTER- V

LAB – XIII (DATA MINING TOOLS LAB)

1. Demonstrate some of the basic data pre-processing operations that can be performed using WEKA-Explorer.
2. Demonstrate Association rule process on dataset using Apriori algorithm.
3. Illustrates the use of simple k-means clustering with WEKA-Explorer.
4. Illustrates the use of k-mediod clustering with WEKA-Explorer.
5. Implement the Decision Tree Induction classification algorithms.
6. Demonstrate the concept of Temporal Data Mining.

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SEMESTER – VI

OPEN SOURCE TECHNOLOGIES

OBJECTIVES: **Total Hours: 45**

- To learn open source S/W, MySQL Database, PHP Scripting, Python programming language and a software design approach called Model Driven Architecture (MDA).

UNIT-I **(9 Hours)**

INTRODUCTION: Introduction to Open Sources-Need of Open Sources-Advantages of Open Sources-Application of Open Sources.

OPEN SOURCE DATABASE: **MySQL**: Introduction-Setting up Account-Starting, Terminating and Writing your Own SQL Programs-Record Selection Technology-Working with Strings-Date and Time-Sorting Query Results-Generating Summary-Working with Metadata-Using Sequences-MySQL and Web.

UNIT-II **(9 Hours)**

OPEN SOURCE PROGRAMMING LANGUAGES: **PHP:** Introduction-Programming in Web Environment-Variables-Constants-Datatypes-Operators-Statements-Functions-Arrays-OOP-String Manipulation and Regular Expression-File Handling and Data Storage-PHP and SQL Database-PHP and LDAP-PHP Connectivity-Sending and Receiving E-mails-Debugging and Error Handling-Security-Templates.

UNIT-III **(9 Hours)**

PYTHON: Syntax and Style-Python Objects-Numbers-Sequences-Strings-Lists and Tuples-Dictionaries-Conditionals and Loops-Files-Input and Output.

UNIT-IV **(9 Hours)**

Errors and Exceptions-Functions-Modules-Classes and OOP-Execution Environment.

UNIT-V **(9 Hours)**

OPEN SOURCE TOOLS AND TECHNOLOGIES: WEB SERVER: Apache Web Server-Working with Web Server-Configuring and Using Apache Web Services.

TEXT BOOKS:

1. Remy Card, Eric Dumas, Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003 (UNIT I).
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002 (UNIT I).
3. RasmusLerdorf, Levin Tatroe, “Programming PHP”, O’Reilly, 2002 (UNIT II).
4. Welsey J. Chun, “Core Phython Programming”, Prentice Hall, 2001 (UNIT III & IV).
5. Peter Wainwright, “Professional Apache”, Wrox Press, 2002 (UNIT V).

REFERENCE BOOKS:

1. W. Jason Gilmore,"Beginning PHP and MySQL from Novice to Professional", Second edition,2007.
2. Steven Holzner,"The Complete Reference PHP", Tata McGraw Hill Edition, 2009.
3. Mark Summerfield " Programming in Python 3: A Complete Introduction to the Python Language", Pearson education,2010.
4. Kenneth A.Lambert, "Fundamentals of Python", Cengage learning,2011.

15CTU37 **SEMESTER – VI**

SOFTWARE TESTING

OBJECTIVES: **Total Hours: 45**

To make the students proficient in:

- Various types and levels of testing strategies.
- Have a knowledge about the quality control & reliability of a software.

UNIT-I **(9 Hours)**

Introduction to Testing – Testing Fundamentals – Defect – Hypothesis & Tests.

UNIT-II **(9 Hours)**

Introduction to Testing Design Strategies – Test Case Design Strategies - Using Black Box Approach – Random Testing – Equivalent Class Partitioning – Boundary Value Analysis – Black Box Test Design Approaches. White Box for Test Design – Coverage Control Graphs – Additional White Box Test Design Approach – Evaluating Test Adequacy Criteria.

UNIT-III **(9 Hours)**

Levels of Testing – Testing Goals – Policies – Plans and Documentation. Test Planning – Plan Components – Plan Attachment – Transmitted Report – Report Test Result – Test Organization – Controlling, Monitoring Testing Process.

UNIT-IV **(9 Hours)**

REVIEW AS A TESTING ACTIVITY – Types – Component of Review Plans – Review Network and Follow up – Review Metrics.

UNIT-V **(9 Hours)**

Quality Concepts – Quality Control – Reliability – Usability Testing – Defect Analysis and Prevention: History – Techniques – Defect Causal – Analysis – Benefits, Defect Prevention.

TEXT BOOK:

1. Ilene Burnstein ,“ Practical Software Testing “ , Springer Professional Computing, 2005.

REFERENCE BOOK:

1.Glenford J Mayers ,“ Art of software testing “,John Willy & Sons, 2nd Edition , 2006

15CTU38A CORE ELECTIVE-II

SEMESTER – VI

CLIENT SERVER TECHNOLOGY

OBJECTIVES: Total Hours: 45

- To Understand Client/Server Operating systems & Transaction Processing.

UNIT - I (9 Hours)

CLIENT/SERVER COMPUTING: Client/Server - Fat Servers or Fat Clients – Intergalactic Client/Server.

CLIENT/SERVER BUILDING BLOCKS: Client/Server: A One-Size-Fits-All Model – Inside the Building Blocks.

THE ROAD TO BANDWIDTH HEAVEN: Modern Network – Is Bandwidth Heaven Around the Corner.

UNIT-II (9 Hours)

CLIENTS, SERVERS, AND OPERATING SYSTEMS: The Anatomy of a Server Program – What Does a Server Need from an OS – Server Scalability – Client Anatomy 101 - What Does a Client Need From an OS.

THE OS WARS: MEET THE PLAYERS: Client OS Trends – Client OS: Meet the Players – Server OS Trends - **Server** OS: Meet the Players.

NOS: Creating the Single – System Image – NOS Middleware: The Transparent Illusion – The Internet: In Certificates We Trust.

UNIT- III (9 Hours)

SQL DATABASE SERVERS: The Fundamentals of SQL and Relational Databases – What Does a Database Server Do – Stored Procedures, Triggers and Rules.

SQL MIDDLEWARE AND FEDERATED DATABASES: SQL Middleware – Will the Real SQL API Please Stand Up? – Open SQL Gateways.

DATA WAREHOUSES: Information Where You Want It : Where Is That OLTP Data Kept? – Information At Your Fingertips – The Data Warehouse.

ESI/DSS : From Queries , To OLAP , To Data Mining: Query/Reporting Tools – OLAP And Multi-dimensional Data – Data Mining – Personal Information Agents.

DATABASE : Meet the players : The Database Client/Server Market – Trends – The Players.

UNIT- IV (9 Hours)

CLIENT/SERVER TRANSACTION PROCESSING: The Magic of Transactions : The ACID Properties- Transaction Model- TP Monitors: Managing Client/Server Transaction: TP Monitors- TP Monitors Benefits- OTMs: TP Monitors Morph with ORBs- TP Monitors: Meet the Players: TP Monitor Market Overview- Trends- The Players-Client /Server Groupware: Why is Groupware Important?- What is Groupware?- The Components of Groupware- Groupware: Meet the Players: Groupware Market Overview- Trends- Lotus Notes/Domino 5.0- Novell's GroupWise-Microsoft's Exchange- Netscape/AOL's SuiteSpot.

UNIT- V **(9 Hours)**

CLIENT/SERVER WITH DISTRIBUTED OBJECTS: DISTRIBUTED OBJECTS AND COMPONENTS: What Distributed Objects Promise- From Distributed Objects to Components- 3-Tier Client/Server, Objects- Style.

CORBA: From ORBs To Enterprise Beans: Distributed Objects, CORBA-Style- CORBA 2.0: The Intergalactic ORB- CORBA Object Services- CORBA Common Facilities- CORBA Business Objects- CORBA 3.0: The Next Generation.

TEXT BOOK:

1. Robert Orfali, Dan Harkey, Jeri Edwards: "Client/Server Survival Guide", Galgotia Publication Private Ltd., 3rd Edition.

REFERENCE BOOKS:

1.Dawna travis Dewire: "Client/Server Computing" – Tata McGraw Hill .
2.Patrick Smith, Steve Gunferich, "Client/Server Computing", PHI Second edition.

15CTU38B **CORE ELECTIVE-II**

SEMESTER – VI

DISTRIBUTED COMPUTING

OBJECTIVES: **Total Hours: 45**

- To Understand the concept of Interprocess Communication.
- To gain the knowledge about Distributed Computing.

UNIT-I **(9 Hours)**

CHARACTERISATION OF DISTRIBUTED SYSTEMS: Introduction - Examples of Distributed Systems - resource sharing and the web - challenges.

SYSTEM MODELS: Introduction - architectural models – fundamental models.

NETWORKING AND INTERNETWORKING: Introduction - types of network - network principles - internet protocols - Ethernet, wireless LAN and ATM.

INTERPROCESS COMMUNICATION: Introduction - the API for the internet protocols - external data representation and marshelling - client server communication - group communication- inter process communication in UNIX.

UNIT-II **(9 Hours)**

DISTRIBUTED OBJECTS AND REMOTE INVOCATION: Introduction - communication between distributed objects - remote procedure call- events and notification – java RMI .

OPERATING SYSTEMS SUPPORT: Introduction-the operating system layer – protection -process and threads - communication and invocation - operating system architecture.

SECURITY: Introduction - overview of security techniques - cryptographic algorithms - digital signatures - cryptography pragmatics.

UNIT-III **(9 Hours)**

DISTRIBUTED FILE SYSTEMS: Introduction - file service architecture - sun network file system – the Andrew file system - recent advances.

NAME SERVICES: Introduction - name service and the domain name system - directory services. **COORDINATION AND AGREEMENT:** Introduction - distributed mutual exclusion – elections - multicast communication - consensus and related problems.

UNIT-IV **(9 Hours)**

TRANSACTIONS AND CONCUURENCY CONTROL: Introduction – transactions - nested transactions – locks - optimistic concurrency control - timestamp ordering - comparison of methods of concurrency control.

DISTRIBUTED TRANSACTIONS: Introduction - flat and nested distributed transactions - atomic commit protocol - concurency control in distributed transactions - distributed deadlocks -transaction recovery.

UNIT-V **(9 Hours)**

REPLICATION: Introduction - system model and group communication - fault tolerant service -highly available service - transaction with replicated data.

DISTRIBUTED TRANSACTIONS: Introduction - characteristics of multimedia data - quality service management - quality of service management – resource management - stream adaption. **DISTRIBUTED SHARE MEMORY :** Introduction - design and implementation issues -sequential consistency and ivy-release consistency and Munin - other consistency models.

TEXT BOOK:

1. George Coulouris, Jean Dollimore, Tim Kindberg, " Distributed Systems Concepts and Design", Pearson Education-Third Edition, 2006.

REFERENCE BOOK:

1. Joel M.Crichlow, " Distributed Systems Computing over Networks", PHI.
2. M.L. Liu , " Distributed Computing Principles and Applications", Pearson Education-Third Edition , 2005.

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SEMESTER – VI

BUSINESS INTELLIGENCE

OBJECTIVES: **Total Hours: 45**

- Introduce the concepts and techniques of business intelligence.
- Facilitate the students to develop a business intelligence projects.
- To know how to apply BI techniques to make timely and better decisions.

UNIT – I **(9 Hours)**

BASICS OF BUSINESS INTELLIGENCE : Business intelligence: Definition - Effective and timely decisions - data, information and knowledge – role of mathematical models - BI architectures. Decision Support Systems: Definition - Representation of the decision making process - Evolution of information systems - development of DSS. Mathematical models for decision making: Structure - development of a model - classes of models.

UNIT – II **(9 Hours)**

BUSINESS INTELLIGENCE STAGES AND STEPS : BI definition - BI decision support initiatives - development approaches - engineering stages and the development steps - parallel development tracks - BI project team structure. Business Case Assessment: justification-drivers-Business Analysis issues - Risk assessment -activities - Deliverables - roles.

UNIT – III **(9 Hours)**

BI PROJECT PLANNING AND REQUIREMENTS DEFINITION : BI project: managing - defining - planning - activities - deliverables - roles. Project Requirements Definition: General and specific requirements - activities - deliverables - roles.

UNIT – IV **(9 Hours)**

DATA ANALYSIS AND APPLICATION PROTOTYPING : Data Analysis: Business focused data analysis - top-down logical data modeling - bottom-up source data analysis - data cleansing - activities - deliverables-roles. Prototyping: Purpose - best practices - types - building successful prototypes - application prototyping activities - deliverables - roles.

UNIT – V **(9 Hours)**

DATABASE DESIGN AND ETL DESIGN : Differences in database design - logical and physical database design - activities - deliverables - roles. ETL Design: Implementation strategies - Preparing for ETL process - Designing the extract programs, transformation programs, load programs, ETL process flow - Evaluating ETL tools - activities – deliverables - roles.

TEXT BOOKS:

1. Carlo Vercellis, "Business Intelligence: Data mining and Optimization for Decision Making", John Wiley and Sons, 2009. (Unit 1)

2. Larissa T.Moss and Shaku Atre, "Business Intelligence Roadmap: The Complete project life cycle for decision support applicatons", Addison Wesley, 2003. (Units II, III, IV & V).

REFERENCE BOOK:

1. Efraim Turban, Ramesh Sharda, Dursun Delen and Janine E. Aronson, "Business Intelligence – A Managerial Approach", 2nd Edition, Pearson Prentice Hall, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes

15CTU40
SEMESTER – VI

LAB-XIV (OPEN SOURCE TECHNOLOGIES LAB)

MYSQL

1. Create Employee Table using MYSQL.
2. Creation of tables using MYSQL with following constraints
   A. Primary Keys
   B. Data Types.
3. Creation of tables using the MYSQL statement with constraints and implement Simple queries on a single table using selection and projection operators.

PHP

4. Create simple website using PHP.
5. Calculate the students mark sheet and display the grade (data base connection)
6. Create two simple text boxes, enter the value or string in one text box and display it in the second text box.
7. Implement manipulation operations using PHP and Mysql.

PYTHON

8. Convert temperature specified in Celsius to Fahrenheit using Python's interactive Prompt.
9. Print the first 10 numbers in the Fibonacci series. Use the range () function.
10. Write a Python script that prints prime numbers less than 20.

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SEMESTER – VI

LAB-XV (SOFTWARE TESTING LAB)

1. Write the test cases for any known application (e.g. Banking application).

2. Create a test plan document for any application (e.g. Library Management System).

Programming in C

3. Write a C program to demonstrate the working of the fallowing constructs in C language using a test suite:
   a) do…while ii) if …else iii) switch iv) for Loops.

Programming in C++

4. Apply black box and white box testing techniques to design a test suite with a high level of path-coverage for Stack class that implements methods such as push, pop and size.

Load Runner

5. Sample script Recording in Virtual User Generator.

6. Running the script in the Controller with Wizard.

7. Running the script in the Controller without Wizard.