JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

Faculty of Education & Methodology
Department of Science & Technology

I Semester

Nature of Course	Course Name	C	T	D&T	P	PS
Core Computer Science	Design and Analysis of Algorithms	10	6	1.2	1.8	1
Core Computer Science	Object Oriented Programming in "C++"	10	6.4	1	1.6	1
Core Computer Science	Software Engineering	7	7	0	0	0
Core Computer Science	Operating System	9	6	0.6	1.4	1
Mathematics	Discrete Mathematics	6	6	0	0	0
University Mission Course	WRL	1	1	0	0	0
University Compulsory Course	Extra-Curricular Activities	1*	0	0	1	0
University Compulsory Course	Community Development Activities	1*	0	0	1	0
Portfolio Development Activity	Portfolio (Government/Corporate/Entrepreneur)	0.8	0.8	0	0	0
University Optional Course	Professional Activity	--	--	--	--	--
Total Credits		**45.8**	**33.2**	**2.8**	**6.8**	**3**

II Semester

Nature of Course	Course Name	C	T	D&T	P
Core Computer Science	Design and Analysis of Algorithms I: Introduction to data structures and algorithms	3.2	2	0.5	0.7
	Design and Analysis of Algorithms II: Graph Algorithm, Searching Algorithm and Greedy Method	3.4	2	0.9	0.5
	Design and Analysis of Algorithms III: Dynamic Programming, Problem Analysis, NP Completeness	2.4	2	0.4	0
	10 Practice Sessions of Algorithm programming using C in Lab	*1*	*0*	*0*	*10 Sessions*
Core Computer Science	Object Oriented Programming in "C++" I: Object Orientation Concepts	2.9	2.2	0.2	0.5
	Object Oriented Programming in "C++" II: Classes and Objects	3.2	2.2	0.5	0.5
	Object Oriented Programming in "C++" III : Inheritance	2.9	2	0.3	0.6
	10 Practice Sessions of Object, Class and inheritance in Lab	*1*	*0*	*0*	*10 Sessions*
Core Computer Science	Software Engineering I : Overview of Software Development and methodology	2	2	0	0
	Software Engineering II : Function-oriented Methodology, Software testing	2	2	0	0
	Software Engineering III : Object-oriented Methodology, Software Project Management	2	2	0	0
Core Computer Science	Operating System I : Introduction and CPU Scheduling	2.2	1.5	0.3	0.4
	Operating System II: Synchronization, Deadlock	2.3	1.5	0.2	0.6
	Operating System III: Logical versus physical address space, Swapping	2.5	2	0.1	0.4
	10 Practice Sessions of Scheduling algorithms and OS commands in Lab	*1*	*0*	*0*	*10 Sessions*
Mathematics	Discrete Mathematics I: Relations, Permutations, Combinations	2	2	0	0
	Discrete Mathematics II: Boolean Algebra, Lattices	2	2	0	0
	Discrete Mathematics III: Graph Theory	2	2	0	0
University Mission Course	WRL	1	1	0	0

University Compulsory Course	Extra-Curricular Activities	1*	0	1	0
	Community Development Activities	1*	0	1	0
Portfolio Development Activity	Portfolio (Government/Corporate/Entrepreneur)	**0.8**	**0.8**	**0**	**0**
University Compulsory Course	Professional Activity	--	--	--	--
Total Credits		**45.8**			

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II- Semester					
Nature of Course	**Course Name**	**C**	**T**	**D&T**	**P**
Core Computer Science	Web Development Techniques I: Introduction, Web Applications	2.6	1.8	0	0.6
Core Computer Science	Web Development Techniques II: Java Scripts	3	2	0.2	0.8
Core Computer Science	Web Development Techniques III: Introduction of PHP	2.4	1.4	0.3	0.7
	2 Practice Sessions from Unit I in University Lab	**0.2**	--	--	**2 Sessions**
Mathematics	Numerical Computation I: Statistical Methods	2	2	0	0
Mathematics	Numerical Computation II: Interpolation and Integration	2	2	0	0
Mathematics	Numerical Computation III: Errors and Approximations in Digital Computers	2	2	0	0
Core Computer Science	Software Project Management I : Project Management	2	2	0	0
Core Computer Science	Software Project Management II : Estimation and Project Scheduling	2	2	0	0
Core Computer Science	Software Project Management III : Quality Management	2	2	0	0
Core Computer Science	Open Source Technology I: Introduction of Open Source	3	2.5	0	0.5
Core Computer Science	Open Source Technology II: Administration	2	1.5	0	0.5
Core Computer Science	Open Source Technology III: Applications	2	1.5	0	0.5
Core Computer Science	UNIT I :Introduction to Grid Computing	2	2	0	0
Core Computer Science	UNIT II :Introduction to Cloud Computing, Virtualization	1.5	1.5	0	0
Core Computer Science	UNIT III :Introduction to intelligent web and Big Data	2	2	0	0
University Compulsory Course	Extra-Curricular Activities	1	0	0	1
University Compulsory Course	Community Development Activities	1	0	0	1
University Compulsory Course	Cyber Security	**1**	**1**	**0**	**0**
Portfolio Development Activity	Portfolio (Government/Corporate/Entrepreneur)	**2.2**	**2.2**	**0**	**0**
University Optional Course	Professional Activity	--	--	--	--
Total Credits		**37.7**			

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Nature of Course	Course Name	C	T	P	PS
III- SEMESTER					
Objective: This Semester covers the subjects required for application development like Advanced Java, Data Ware Housing and Data Mining, Cognitive psychology.					
Core Computer Science	Java Programming With GUI I: Introduction the Abstract Window Toolkit (AWT) and Java Swing	3	2	0.5	0.5
	Java Programming With GUI II: Overview of Packages	4	2	1.6	0.5
	Java Programming With GUI III: Data Base Connectivity	4	2	1.6	0.4
Core Computer Science	Data Ware Housing and Data Mining I: Basics of Data Warehouse	2	2	0	0
	Data Ware Housing and Data Mining II : Data Preprocessing, Language, Architectures	2	2	0	0
	Data Ware Housing and Data Mining III: Classification & Clustering	2	2	0	0
Core Computer Science	Cognitive psychology I: history of the cognitive approach	2	2	0	0
	Cognitive psychology II: Communication and Language Processing	2	2	0	0
	Cognitive psychology III: Contribution of cognitive psychology	2	2	0	0
Electronics and Communication	Digital Electronics I: Number systems and different types of number systems	2.6	2	0.4	0.2
	Digital Electronics II : Combinational & Sequential circuits, flip flops	3	2	0.3	0.7
	Digital Electronics III : Counters, Asynchronous (ripple), synchronous and synchronous decade counter	1	1	0	0
Core Computer Science	Multimedia System and Animation I: Introduction	3	2	0.8	0.2
	Multimedia System and Animation II: Tools of Multimedia	3.5	1.5	1.2	0.8
	Multimedia System and Animation III: Animation	3	2	0.8	0.2
Professional Development Activity	Certified Training	4	4	0	0
Professional Development Activity	Industrial Visit	1	1	0	0
University Compulsory Course	Extra Curricular Activities	1	0	1	0
University Compulsory Course	Community Development Activities	1	0	1	0
Portfolio Development Activity	Portfolio (Government/Corporate/Entrepreneur)	0.8	0.8	0	0
Total Credits		46.9			

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	IV- SEMESTER				
Objective: This Semester covers the subjects required for application development like Advance database management system, Artificial intelligence, network programming, and microprocessor.				
Nature of Course	**Course Name**	**C**	**T**	**P**	**PS**
Core Computer Science	Advance Database Management System I: Introduction to Data Base Systems	2	1.5	0.5	0
	Advance Database Management System II: Relational Model and Normalization	2.8	2.0	0.8	0
	Advance Database Management System III: Concurrency Control, Transaction and Security	2.8	2	0.8	0
Core Computer Science	Artificial Intelligence & Applications I: Introduction to Artificial Intelligence	2	2	0	0
	Artificial Intelligence & Applications II: Knowledge Representation	2	2	0	0
	Artificial Intelligence & Applications III: Game Playing	2	2	0	0
Core Computer Science	Network programming I: Basics of TCP Sockets	2	1.5	0.5	0
	Network programming II: TCP Echo Server-Client	3	2.5	0.5	0
	Network programming III: TCP Echo Server-Client	2	1.5	0.5	0
Electronics and Communication	Microprocessor I : Introduction to microprocessor	3.6	2	1.6	0
	Microprocessor II : 8085 micro processor	2.8	2	0.8	0
	Microprocessor III : Direct memory access	1.7	1	0.7	0
Core Computer Science	Web Intelligence, HADOOP and Big data Analysis I: Introduction to intelligent web and listen and load	1.9	1.5	0	0.4
	Web Intelligence, HADOOP and Big data Analysis II: Clustering and generic Methods	2.5	1.5	0	1
	Web Intelligence, HADOOP and Big data Analysis III: Introduction of HADOOP	2.6	2	0	0.6
University Compulsory Course	Extra Curricular Activities	1*	0	1	0
University Compulsory Course	Community Development Activities	1*	0	1	0
Portfolio Development Activity	Portfolio (Government/Corporate/Entrepreneur)	**2.2**	**2.2**	**0**	**0**
	Total Credits	**39.9**			

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JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

MCA VI Semester

Objective: This Semester is to give the students an insight into various fields like Information Security, Computer Graphics, Software Project Management, Organizational Behavior, Advanced Web Technologies.

Nature of Course	Course Name	C	T	D & T	P 1	Ps
Core Computer Science	Cryptography & Network Security I: Conventional And Modern Encryption	2	2	0	0	0
Core Computer Science	Cryptography & Network Security II: Public Key Encryption & Authentication	2	2	0	0	0
Core Computer Science	Cryptography & Network Security III: System Security	2	2	0	0	0
Core Computer Science	Computer Graphics I: Application areas of Computer Graphics	2.7	1.7	0	0.8	0.2
Core Computer Science	Computer Graphics II: 2-D geometrical transforms	3.5	2	0	1.1	0.4
Core Computer Science	Computer Graphics III: 3-D object representation	2.8	2	0	0.5	0.3
Management	Organizational Behavior I: Fundamental concepts of OB	2	2	0	0	0
Management	Organizational Behavior II: Personality & Attitudes	2	2	0	0	0
Management	Organizational Behavior III: Motivation, Theories of Work Motivation	1.5	1.5	0	0	0
Core Computer Science	Advanced Web Technologies I: The Basics of PHP scripts. The Building blocks of PHP	3.5	2	0	1	0.5
Core Computer Science	Advanced Web Technologies II: Working with Objects	3.8	2	0	1.2	0.6
Core Computer Science	Advanced Web Technologies III: Learning the MySQL Data types	2.7	2	0	0.4	0.3
Core Computer Science	Cloud Computing I: Introduction to Cloud Computing, Virtualization	2	2	0	0	0
Core Computer Science	Cloud Computing II :Private, Public & Hybrid Clouds, Setting up your own Cloud	2	2	0	0	0
Core Computer Science	Cloud Computing III: Cloud Security	2	2	0	0	0
University Compulsory Course	Extra Curricular Activities	1*	0	0	1	0
University Compulsory Course	Community Development Activities	1*	0	0	1	0
University Compulsory Course	Seminar	1	0	0	0	1
Portfolio Development Activity	Portfolio (Government/Corporate/Entrepreneur)	2.2	2.2	0	0	0
Total Credit				40.7		

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Program Outcomes:

On completion of MCA degree, the graduates will be able to:

- Apply the knowledge of mathematics and computing fundamentals to various real life applications for any given requirement
- Design and develop applications to analyze and solve all computer science related problems
- Design applications for any desired needs with appropriate considerations for any specific need on societal and environmental aspects
- Analyze and review literatures to invoke the research skills to design, interpret and make inferences from the resulting data
- Integrate and apply efficiently the contemporary IT tools to all computer applications
- Solve and work with a professional context pertaining to ethics, social, cultural and cyber regulations

Semester I

Sub: Design and Analysis of Algorithms
Course Outcomes: By the end of course through lectures, readings, homeworks, lab assignments and exams, students will demonstrate: - The abilities to apply knowledge of computing and mathematics to algorithm design; to analyze a problem and identify the computing requirements appropriate for its solution;

UNIT – I (Introduction to data structures and algorithms) (2-0.7)
Theory   **(2 Credits)**

Introduction of Linear Data Structures, arrays, lists, stacks, queue. Linked Lists**:** Single linked list, linked stacks and queues, Circular linked list, Doubly linked list and Generalized list, Introduction of Non Linear Data Structures: Trees and Graphs. Introduction, Basics of Algorithms, Models of Computation: space and time complexity measures, lower and upper bounds, Abstract Data Type, Complexity analysis and measures, The Running Time of a Program, Use of the Big-Oh, small o, Big-omega and small omega notation,

Practical (0.7 Credit) Practice(0.5 Credit) D&T 0.5 Credit
1. Perform recursive binary and linear search.
2. Sort a given set of elements using Heap sort technique.
3. Sort a given set of elements using Merge sort technique.
4. Sort a given set of elements using Insertion sort technique.
5. Sort a given set of elements using Quick sort technique.
6. Example of a searching algorithm implementation.
7. Example of a sorting algorithm implementation

UNIT-II(Graph Algorithm, Searching Algorithm and Greedy Method)   (2-0.5)
Theory (2 Credits)

Study and analysis of basic sorting algorithms like Heap Sort, Radix Sort, Bucket Sort and Merge sort. Graph Algorithms: connectivity, strong connectivity, bi-connectivity, Graph traversals, topological sort, shortest paths, minimum spanning trees, network flow; The disjoint set union problem; String matching; order statistics. Searching algorithm (Depth and Breadth first search in graphs), divide-and-conquer, Backtracking Algorithm. Greedy Method: Knapsack Problem.

Practical (0.5 Credit) Practice (0.5 Credit) D&T 0.9 Credit
1. Check whether a graph is connected using Depth first technique.
2. Sort a given set of elements using Selection sort technique.
3. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.
4. Find minimum cost spanning tree of a given undirected graph using Kruskal's algorithm.
5. Print all the nodes reachable from a given starting node in a digraph using Breadth first search technique.

UNIT-III (Dynamic Programming, Problem Analysis, NP Completeness) (2-0)
Theory (2 Credits) D&T 0.4 Credit

Dynamic Programming: Matrix Chain Multiplication, Longest Common Subsequence and 0/1 Knapsack Problem. Branch and Bound: Travelling Salesman Problem and Lower Bound Theory. Pattern Matching Algorithms: KMP Matcher and Boyer Moors Algorithms.

Recommended Text Book:
1. Rivest and Cormen, Introduction to Algorithms, Prentice Hall of India.

Suggested Readings:
1. Aho A.V., J.E. Hopcroft, J.D. Ullman; Design and Analysis of Algorithms, Pearson Education.
2. Baase, Computer Algorithms Pearson Education.
3. Brassard, Algorithms Prentice Hall.
4. Bazaraa, Linear Programme & Network Flows, John Wiley & Sons.

Sub: Object Oriented Programming in "C++"

Course Outcomes: The objectives of the course are to have students identify and practice the object-oriented programming concepts and techniques, practice the use of C++ classes and class libraries, arrays, vectors, inheritance and file I/O stream concepts.

UNIT I (Object Oriented Concepts) (2.2-0.5)

Theory (2.2 Credits)

Object Orientation Concepts, Object Oriented Methodology, Features, Application and Advantages of OOP's, What is C++, Programming Paradigms, Procedural Programming, Modular Programming, Data Abstraction, Data Types, new operators and keywords, Type conversions in C++, reference variables, arrays etc.

Practical (0.5 Credit)

Practice (0.3 Credit) D&T 0.2 Credit

1. Programs based on variables and assignment.
2. Programs based on arithmetic operators
3. Programs based on logical operators.
4. Programs based on conditional Statements
5. Programs based on looping statements

UNIT II (Classes and Objects) (2.2-0.5)

Theory (2.2 Credits)

Classes and Objects, Classes and Access Specifiers, Defining data members and member functions, Array of objects, Usage of namespace, Managing Console I/O, Usage of Manipulators, Usage of Constructors and Destructors, Functions in C++ , Call by reference, return by reference, Function overloading, Inline Functions, Friend Functions, Static class members, Operator Overloading , Overloading unary and binary operators, Usage of this pointer, Overloading using friend functions, Overloading "<<" and ">>" operator.

Practical (0.5 Credit)

Practice (0.3 Credit) D&T 0.5 Credit

1. Programs related to essentials of object oriented programming:
    i. Classes & Objects
    ii. Constructor & Destructor
2. Access Specifiers, abstract data types
    i. Returning and passing objects as parameter
3. Nested and inner classes
4. Programs based on the Polymorphism concept: function overloading.
5. Programs based on the Polymorphism concept: operator overloading.

UNIT III (Inheritance) (2-0.6)

Theory (2 Credits)

Inheritance, Introduction, Types of Inheritance, Base class and derived class examples, Virtual base class, Abstract class, Virtual functions and pure virtual functions, Exception handling, Error Handling , Error Handling Alternatives, Exception Specification, Exception in Constructors & Destructors, Uncaught Exceptions, Standard Exceptions.

Practical (1 Credit)

Practice (0.4 Credit) D&T 0.3 Credit

1. Programs based on the Inheritance (super class - sub class) concept.
2. Programs based on different types of inheritance.
3. Programs based on Pointers to Objects.
4. Programs based on friend function.
5. Exercise based on static functions.
6. **Designing of Object & Class diagram: links and associations.**

Recommended Text Books:

1. Object Oriented Programming (C++) – Balaguruswamy

Suggested Readings:

1. The C++ Programming Language - Bjarne Stroustrup
2. Thinking in C++ - Bruce Eckel
3. C++ Programming Today – Barbara Johnstron
4. Problem Solving with C++ - Walter Savitch

Sub: Software Engineering

Course Outcomes: Work as an individual and as part of a multidisciplinary team to develop and deliver quality software. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.

UNIT- I (Software evolution)(2-0-0)
Theory   **(2 Credits)**
Issues in Software Engineering, Software evolution: Concepts of product life cycle, Development life cycle models: Waterfall, Spiral, Iterative enhancement and phased development, Computer system engineering: Overview, various phases, analysis, design, development and implementation. Cost Estimation Techniques, Metrics for software productivity and quality, Effort Estimation: Overview, COCOMO, Putnam, Sterling models, automated estimation tools.

UNIT- II (Software Project Scheduling) (2-0-0)

Theory   **(2 Credits)**
Software Project Scheduling: Task definition and parallelism, effort distribution, scheduling Methods: PERT and CPM, Software project plan outline Software prototyping: Overview, steps, methods, tools, specification, guidelines Requirement analysis methods: introduction, methods Software implementation: Issues, concept of programming support environment Software Testing overview: various tests and methods: top-down, bottom-up, mixed Debugging: definition, techniques and strategies, exhaustive testing, classification.

UNIT - III (System integration)(2-0-0)
Theory   **(2 Credits)**
System integration: Overview, integration of hardware and software component Strategies software configuration management activity, planning, monitoring Controlling, Resource management, Product assurance: overview, quality assurance Software quality assurance: Definitions, various types, trade-offs, verification and validation Configuration management: identification, control, auditing, status accounting, , overview, definition, V and V life cycle.

Recommended Text Books:

1. Pressman "Software Engineering A Practitioner's Approach" McGraw-Hill, 5th edition,

Suggested Readings:
1. Shooman "Software Engineering Design, Reliability and Management" ,McGraw Hill 1983
2. Fairley "Software Engineering Concepts", McGraw--Hill Series, New York, 1985

Sub: Operating System

Course Outcomes: To make the computer system convenient to use in an efficient manner. To hide the details of the hardware resources from the users. To provide users a convenient interface to use the computer system.

UNIT – I (Introduction and CPU Scheduling) (1.5-0.4)
Theory (1.5 Credits)
Introduction: Types of OS - multiprogramming, time sharing, real time systems, multiprocessor system. Concepts of process, Process and Threads: Life cycle and implementations of process. CPU Scheduling : Review of multiprogramming, concept, scheduling concept, scheduling algorithms, algorithm evaluation, multiple processor scheduling, disk and drum scheduling: Physical characteristics, first come first serve scheduling, shortest seek time first scheduling, SCAN
Practical (0.4 Credit) Practice (0.4 Credit) D&T 0.3 Credit
1. Program based on FCFS Scheduling.
2. Program based on Round robin Scheduling.
3. Program based on shortest job first scheduling.
4. Program based on shortest seek time first scheduling

UNIT – II (Synchronization and Deadlock) (1.5-0.6)
Theory (1.5 Credits)
Synchronization: - Peterson's solution - Bakery algorithm - Hardware-based solutions – Semaphores Deadlocks: The deadlock problem, deadlock characterization, deadlock presentation, deadlock avoidance and Banker's algorithms. Concurrent Process: Precedence graph, specification, review of process concept, hierarchy of process, the critical section problem, semaphores, classical process coordination problem, inter process communication -Race conditions, Critical regions, Mutual exclusion with busy waiting, sleep and wakeup.
Practical (0.6 Credit) Practice (0.3 Credit) D&T 0.2 Credit
1. Program for Banker's Algorithm.
2. Program for Deadlock detection and Prevention.
3. Essential Linux commands Understanding shells,
4. Commands for files and directories cd, ls, cp, mv,

UNIT – III (Memory management and Unix File System) (2-0.4)
Theory (2 Credits)
Memory management: Bare machine, resident monitor, swapping, multiple partition, paging, segmentations, Paging and Virtual memory, FCFS, FRU - Belady's anomaly, Thrashing - Working set. Virtual memory: overlays, demand paging, page replacement, virtual memory concepts, page replacement algorithms, belody's anomaly, allocation algorithm, thrashing, I/O devices and device controllers; Interrupt handlers, disk arm scheduling algorithm. Design of the Unix File System - Buffer caches - File system organization – I-nodes File tables - Inode tables - Network file systems.
Practical (0.4 Credit) (0.3 Credit) D&T 0.1 Credit
1. file, more, less, creating and viewing files using cat,
2. file comparisons – cmp & comm, View files,
3. disk related commands, checking disk free spaces
4. Creating and editing files with vi editor

Recommended text Books:
1. Operating System Concepts, Seventh Edition, Avi Silberschatz, Peter Baer Galvin, Greg Gagne, Publisher: Wiley
2. W.STALLINGS, "Operating Systems", Prentice Hall, V Edition, 2005
Suggested Readings:
1. A.S. Tanenbaum Modern Operating Systems, Pearson Education Asia.

Sub: Discrete Mathematics

Course Outcomes: Prove mathematical theorems using mathematical induction. Understand sets and perform operations and algebra on sets. Determine properties of relations, identify equivalence and partial order relations, sketch relations. Identify functions and determine their properties.

UNIT – I (Relations,Permutations and Combinations)(2-0-0)

Theory   **(2 Credits)**

Fundamentals: Sets and Relations- Sets, Multi Sets, Operations on Sets, Relations and Properties of Relations, Representation of Relations, Equivalence Relation, Closures of Relations, Method of Contradiction. Permutations and Combinations, Pigeon Hole Principle, Principle of Inclusion and Exclusion.

UNIT – II (Boolean Algebra,Lattices) (2-0-0)

Theory   **(2 Credits)**

Boolean Algebra, Posets and Lattices: Partial Order Set, Poset, Bounding Elements, Well Ordered Set, Lattices, Principle of Duality, Bounded, Distributed, and Complemented Lattices, Finite Boolean Algebra, Boolean Functions and Expressions, Proposition and Propositional Calculus.

UNIT – III (Graph Theory)(2-0-0)

Theory   **(2 Credits)**

Graphs and Group Theory: Basic Introduction of Graphs- Types of Graphs, Path and Circuits, Eulerian Path and Circuits, Hamiltonian Path and Circuits, Trees, tree traversal, Spanning Trees, Dijkstra, Prim's and Kruscal's Algorithms. Finite state machine, Non Deterministic Finite Automata, Deterministic Finite Automata.

Recommended Books:
1. C.L.Liu, "Elements of Discrete Mathematics", TMH, 2000.

Suggested Readings:

1. Keneth H.Rosen, "Discrete Mathematics and Its Applications", TMH, 1999.
2. Trembly J.P. & Manohar P., "Discrete Mathematical Structure with Applications to Computer Science", McGraw Hill, 1997.
 3. Narsingh Deo, "Graph Theory with Application to Engineering and Computer Science", PHI, 2004.

Women Rights and Law

Credits-1

Definition of Women, Awareness about Women Rights, Appeal for Remedies, Rights and Awareness on Marriage and Divorce, Rights on Mainitainance, Rights on Adoption, Rights on Sucession, Indian Divorce Act, 1869, Crime Against Women, Immoral Traffic, Sexual Harrasment of Women, Pre-Natal Diagnostic Techniques and Oath

Recommended Text Books:

1. Law relating to Women – S.R.Myneni

2. Law relating to Women – Dr. S.C. Tripathi

Reference Books:

1. Women and Law – Prof. Nomita Aggarwal

2. Women and Law – Dr. Manjula Batra

3. Women and Law – G.P. Reddy

Semester II

Sub: Web Development Techniques
- **Course Outcomes**: Structure and implement HTML/CSS.
- Apply intermediate and advanced web development practices.
- Implement basic JavaScript.
- Create visualizations in accordance with UI/UX theories.
- Develop a fully functioning website and deploy on a web server.

UNIT-I (Internet Principles, Web Applications)(1.8-0.6-0.2)
Theory   **(1.8 Credits)**
Internet Principles-Basic web concepts - client/server model Internet protocols and applications. Introduction about WWW, Web Applications, Web Browsers, HTML: Introduction of HTML, HTML Elements, HTML Basic Tags, HTML Formatting, HTML Entities, HTML Links, HTML Frames, HTML Tables, HTML Lists, HTML Forms, HTML Images. Cascaded Style Sheet: CSS Introduction, Syntax, Setting Background, Text, Font, Border, Margin, Padding, List, Dimension, Classification, Positioning, Pseudo-class, Pseudo-element, CSS Media Types, External, Internal and Inline style sheet.

Practical   **(0.6 Credits)**
Practice   **(0.2 Credits)**

S.No.	Name of Practical	Practical	Practice
1	Designing a static web page using HTML.		0.1
2	Designing a dynamic webpage using DHTML using different style sheets.		0.1

UNIT-II (Java Scripts)

                                                                                             (2-0.8-0)
Theory (2 Credits) D&T(0.2 Credits)
Java Scripts: Variables declaration, If...Else statement, Switch statement, Operators statement, Popup Boxes, Functions, For Loop, While Loop, Break Loops, For...In, Events, Try...Catch, Throw on error. Java Script Objects: Introduction, String, Date, Array, Boolean, Math, JS Browser, JS Cookies, Validation, Animation, Image Maps, Timing, Create Object.

Practical   **(0.8 Credits)**

S.No.	Name of Practical	Practical	Practice
1	Programs on Working with AWT	0.2	
2	Programs on different layouts in Java	0.2	
3	Programs using Java Applets	0.2	
4	Program in Java Script.	0.2	

UNIT-III (PHP) (1.4-0.7-0)

Theory (2 Credits)

Introduction of PHP, Installation, Syntax, Variables, strings, operators, control structures, arrays, functions, forms, GET & POST methods. Advance Operations: Date, Inculde, File & File Upload, Cookies & Session Handling, Error & Exception Handling, Filtering, Database Connectivity.

Practical (0.7 Credits)

D&T(0.3 Credits)

S.No.	Name of Practical	Practical	Practice
1	Basic Implementation in PHP and exception Handling.	0.2	
2	Program of Database connectivity in PHP.	0.2	
3	Program for GET method.	0.2	
4	Program for POST method.	0.1	

Recommended text Books:

1. Core PHP Programming By Atkinson, Leon (Author), Suraski, Zeev (Author) Third Edition, Prentice Hall
2. Head First HTML with CSS & XHTML By Elisabeth Freeman, Eric Freeman December 2005
3. JavaScript: The Complete Reference, 2nd edition, Tata McGraw Hill.
4. Harvey M. Deital and Paul.J.Deitel, "Internet & World Wide Web How to Program", 4th Edition, 2008

Reference Books:

1. PHP 5 For Dummies, by Janet Valade, Wiley Publishing, Inc.
2. Programming PHP, By Rasmus Lerdorf, Kevin Tatroe, O'Reilly

Sub: Numerical Computations

Course Outcomes: Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations. Analyse and evaluate the accuracy of common numerical methods.

UNIT-I Statistical Methods (2-0-0)
Theory   **(2 Credits)**
Statistical Methods : Treatment of data, Frequency Distribution, measures of central tendency, dispersion & partition values. Probability Probability distribution – Binomial, Poisson & Normal. Method of least square, correlation and regression.

UNIT-II (Interpolation and Integration) (2-0-0)
Theory   **(2 Credits)**
Interpolation: Newton's forward and backward difference formulae, Lagrange's Interpolation formula, inverse interpolation. Numerical Differentiation, derivatives from Newton-Goegory Forward Polynomial. Numerical Integration: Newton-Cotes formulae, Weddle's, Trapezoidal & Simpson's rule, Numerical solution of ordinary differential equations: ODE's as a system of first order ODE's, Euler's, and Picard's.

UNIT-III (Errors and Approximations in Digital Computers) (2-0-0)
Theory   **(2 Credits)**
Errors and Approximations in Digital Computers, Number representation, Floating point Arithmetic. Solution of system of linear equations – direct method, Gauss Jordan & Gauss Elimination methods, Pivoting, Iterative methods – Jacobi & Gauss Seidel methods. Solution of Nonlinear equations in n variable: Localization of the roots, Bisection and Regula- Falsi methods, Newton-Raphson method, successive Approximation method.

Recommended text Books:
1) Computer Oriented Numerical Methods: Raja Raman, V., Prentice Hall.

Reference Books:

1)   Introductory Methods of Numerical Analysis, S.S. Sastry, Prentice Hall, India
2)   Computer Based Numerical Algorithms: Krishnamurthy E.V.;East West Press
3)   Elementary Numerical Analysis : Conte de Boor.
4)   Mathematical Statistics with Applications, John E. Freund's, Pearson publications, New Delhi.

Sub: Software Project Management

Course Outcomes: project management objectives are the successful development of the project's procedures of initiation, planning, execution, regulation and closure as well as the guidance of the project team's operations towards achieving all the agreed upon goals within the set scope, time, quality and budget standards.

Unit-I (Project Management) (2-0-0)
Theory   **(2 Credits)**
Project Management: The management spectrum, the people, the product, the process, the project W^5 HH principle, critical practices. Metrics for Process and Project: Metrics in the process and project Domains, software measurements, metrics for software quality, integrating metrics within software Process metrics for small organizations, establishing a software metrics program.

Unit-II (Estimation and Project Scheduling) (2-0-0)
Theory   **(2 Credits)**
Estimation: Observations, Project planning Process, software project estimation, decomposition techniques, empirical estimation models, estimation for object oriented projects, estimation for Agile development and web engineering projects, Project Scheduling: Basic concepts, project scheduling, defining a task set and task network, scheduling, earned value analysis. Risk Management: Reactive V/S proactive Risk Strategies, software risks, Risk identification, Risk projection, risk refinement, risk mitigation, monitoring and management, the RMMM plan. Quality Planning: Quality Concepts, Procedural Approach to Quality Management, Quantitative Approaches to Quality Management.

Unit-III (Quality Management) (2-0-0)
Theory   **(2 Credits)**
Quality Management: Quality Concepts, Software Quality assurances, software reviews formal technical reviews, Formal approaches to SQA, Project Execution And Closure, The Review Process, Planning, Overview and Preparation, Group Review Meeting, Rework and Follow-up, One-Person Review Guidelines for Reviews in Projects, Data Collection, Project Monitoring and Control.

Recommended Text Books:
1. Bob Hughes, Mikecotterell, "Software Project Management", Third Edition, Tata McGraw Hill, 2004.

Reference Books:
1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, "Software Project Management", Pearson Education, 1999.
3. Jalote, "Software Project Manangement in Practive", Pearson Education, 2002

Sub: Open Source Technology

Course Outcomes: At the end of this course student will:

Implement various applications using build systems. Understand the installation of various packages in open source operating systems. Create simple GUI applications. Understand various version control sytems. Understand the kernel configuration and virtual environment.

UNIT- I (Introduction of Open Source) (2.5-0.5-0)

Theory (2.5 Credits)

Open Source and Linux Open Source Definition, The distribution terms of open source software, open source technology importance, Free and Open Source (FOSS), LAMP (Linux, Apache, MySQL, PHP, Python, and Perl.). Benefits, Perspectives of Open Source software Linux and Open Source, Linux Usage Basics: Logging into the system, changing users and editing text files. Running Commands and Getting Help, Browsing the File system, Users, Groups and Permissions. Introduction to Web server. Installing Apache on Linux: httpd service.

Practical(0.5 Credit)
1. Red hat Enterprise Linux installation.
2. How to Break Root Password.
3. To Create Encrypted password for Grub.
4. Perform Basic Linux Commands
   - To create a directory.
   - To remove a directory
   - To check content in a directory
   - Create directory into directory
   - To create a File
   - To add content in File
   - To assign permanent IP
   - To copy content of File1 into File2
   - To copy content of File1 & File2 into File3

UNIT- II (Administration) (1.5-0.5-0)

Theory (1.5 Credits)

Linux Administration: Installation of Linux interactively, Perform user and group administration, Administer the Linux printing subsystem, Automate tasks with at, cron ,Install, update, query and remove software packages with RPM.

Practical(0.5 Credit)
1. When we Forgot root password & Grub Password, how to crack root password?
2. Perform the Following:
   - How to set default mode as a text mode.
   - How to set text mode as a default mode.

UNIT- II (Application) (1.5-0.5-0)

Theory (1.5 Credits)

Linux Application: Accessing and Running Applications: cc compiler, gcc Compiler, Mozilla Firefox. Multimedia in Linux : Listening to Audio, Playing video, Using Digital Camera, Recording music / video CDs. 12 Publishing: Open office, Working with Graphics, Printing Documents, Displaying documents with Ghost-script and Acrobat, Using Scanners driven by SANE.

Practical(0.5 Credit)
1. To change and assign permissions to group, user and owner.
2. Perform the Following:
   - How to start system services.
   - To start permanently system services.

Sub: Introduction of Grid Computing, Cloud Computing, WEB INTELLIGENCE and Big Data

Course Outcomes: Cloud computing makes the system all-time accessible. Grid computing refers to a network of the same or different types of computers whose target is to provide an environment where a task can be performed by multiple computers together on a need basis. Each computer can work independently as well.

UNIT I (Introduction to Grid Computing): (2-0-0)

Introduction of Grid Computing, Benefits of Grid Computing, Grid Terms and Concepts,Grid User Roles, Standards for Grid environments, Grid Security Requirements, Grid Security Fundamentals, Symmetric and Asymmetric key encryption, Certificate Authority, Grid Security Infrastructure.

Theory (2 Credits)
UNIT II (Introduction to Cloud Computing, Virtualization): (1.5-0-0)

Theory (1.5 Credits)
What is cloud? Services provided by cloud are categorized :Software As a Service(SaaS) ,Infrastructure As a Service(IaaS) ,Platform As a Service(PaaS) ,Desktop As a Service (DaaS) and VDI etc. How Cloud Computing Works, Advantages & Disadvantages, and Applications for Businesses Cloud Service Providers.Brief overview of major Cloud Service providers – Amazon AWS, Google App Engine, Microsoft, VMware. How Companies are using Cloud Computing Cloud Computing Risks and IssuesVirtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS (Hypervisor), HA/DR using Virtualization.

UNIT III (Introduction to intelligent web and Big Data): (2-0-0)

Theory (2 Credits)
Inside the search engine - Examples of intelligent web applications - Basic elements of intelligent applications - Machine learning, data mining – Searching, Reading, indexing, and searching. Streams, Information and Language, - Statistics of Text - Analyzing Sentiment and Intent – Load - Databases and their Evolution, Big data Technology and Trends. Working with Big Data: Google File System, Hadoop Distributed File System (HDFS).

Recommended Text Books:
1. **Cloud Computing: Web Based Applications** That Change The Way You Work And Collaborating Online, **By Michael Miller.**

Suggested Readings:
1. Bart Jacob,Michael Brown, **Red Books: Introduction to Grid Computing.**
1. Barrie Sosinsky,**Cloud Computing Bible**
2. *Robin Bloor*, *Marcia Kaufman*, and *Fern Halper,* **Cloud Computing for Dummies**

Cyber Security

Course Outcomes: Conduct a cyber security risk assessment. Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions. Be able to use cyber security, information assurance, and cyber/computer forensics software/tools.

Credit-1

Introduction to Security,What are Physical and Non-Physical threats of a computer,Computer Security, Need of security for computer, Introduction to information Security, Prinicipals of Informtion Security. Browser Application Security,Configuring Chrome,Mozila,Internet Explorer Security Settings, Protect your identity theft,keeping personal information physically secure, Phishing,Avoidance of phishing scams, Protection of Phishing Scam, Identify :Theft Awarness,Password Security,Safe social networking,Secure Online Shopping(Physically and Non Physically),Securing your Emails, Anti-virus, firewall and anti-spyware software, Back up your Data, Removable Media Security,Handheld device security

Internet Ethics:Internet:

Reviewing the concept Internet Ethics, Unethical behavior in Internet & Examples, (a) Using of computer resources improperly, (b)Using computers, data, information to harm others (c) Using Internet,
one shall not forward false communication, Acceptable behavior: (a) While using e-Mail and chatting, (b)Pretending someone else, (c) Avoid Bad Language. Internet Ethics:Internet: Reviewing the concept Internet Ethics, Unethical behavior in Internet & Examples, (a) Using of computer resources improperly, (b)Using computers, data, information to harm others (c) Using Internet, one shall not forward false communication, Acceptable behavior: (a) While using e-Mail and chatting, (b)Pretending someone else, (c) Avoid Bad Language, Cyber Ethics,What is Cyber Security, What is Cyber safety, Difference between cyber safety and cyber security

Cyberbullying

Introduction to Cyberbullying, Risk factors, Signs for Cyber bullying, how to Prevent Cyber bullying, Guidelines for Cyberbullying, Role of Electronoic and Digital Signature, Informaion Security Policies and Case Studies, Cyber Security Law:Introduction to Cyber Laws, Classification of Cyber Crimes, Importance of cyber laws

III- SEMESTER

Sub: Java Programming With GUI

Course Outcomes: The primary objective of Java programming language creation was to make it portable, simple and secure programming language. Apart from this, there are also some excellent features which play an important role in the popularity of this language. The features of Java are also known as Java buzzwords.

UNIT- I (Introduction) (2-0.5-0.5)
Theory (2 Credits)

Designing Graphical User Interfaces in Java, Components and Containers, Basics of Components, Using Containers, Layout Managers, AWT Components, Adding a Menu to Window, Extending GUI Features Using Swing Components, Java Utilities (java.util Package) The Collection Framework : Collections of Objects , Collection Types, Sets , Sequence, Map, Understanding Hashing, Use of ArrayList & Vector.
Introduction the Abstract Window Toolkit (AWT): Working with Windows and AWT, AWT classes, Windows Fundamentals, Working with frame windows, applet vs servlet.
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S.No.	Name of Practical	Practical	Practice
1	Write a program to create a textfield and input the value from the user.	0.1	0.1
2	Write a program to create a basic calculator using textfiled,checkbox,buttons.	0.1	0.1
3	Write a program to create a form and get the value from the user.	0.1	0.1
4	Write a program to create a login form and perform authentication if the username is Admin and Password is Admin.	0.1	0.1
5	Write a program to create a signup form and perform authentication if the username is Admin and Password is Admin	0.1	0.l

UNIT- II (Overview of Packages) (2-1.6-0.4)
Theory (2 Credits)

Applets: Applet fundamentals, implementation of applet, creating a frame window in applet, paint method, drawing polygons.
Basics :Swing Introduction,MVC,Events and listeners.,Adapters.,Text Components,Look and feel.
Swing Components: JCoponent, JLabael, JButton, Actions,JScrollBar, JSlider, JProgressBar,JList, JComboBox,Containers and Frames,JPanel, JRootPane,JInternalFrame,JDialog, JOptionPane
Layout Managers:Layout managers overview,Flow layout,Grid layout,Border layout,Working without layouts,Gridbag Layout.
Menus and Toolbar:JMenuItem,JMenuBar,JPopupMenu,JToolBar.

S.No.	Name of Practical	Practical	Practice
1	Write programs to demonstrate use of Grid Layout.	0.2	0.1
2	Write programs to demonstrate use of flow and Layout.	0.2	0.1
3	Write programs to demonstrate use of Border Layout.	0.2	
4	Write a program to display any string using available Font and with every mouse click change the size and / style of the string. Make use of Font and Font metrics class and their methods.	0.2	0.1
5	Write a program to design a form using basic swing components	0.2	
6	Write a program to demonstrate the use of scroll panes in Swing.	0.2	
7	Write a program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box.	0.2	0.1

UNIT- III (Data Base Connectivity) (2-1.6-0.4)

Theory (2 Credits)

Java Database Backend End: Database client/server methodology, Two-Tier Database Design, Three-Tier Database Design, A JDBC Database Example JDBC Drivers, JDBC-ODBC Bridge, Current JDBC Drivers.
Basics Of Servlet: The Life Cycle of a Servlet, The Java Servlet Development Kit, The Simple Servlet, The Servlet API, The javax.servlet Package, Reading Servlet Parameters, Reading Initialization Parameters, The javax.servlet.http package, Handling HTTP Requests and responses.

S.No.	Name of Practical	Practical	Practice
1	Write an Application program /Applet to make connectivity with database using JDBC API	0.2	0.1
2	Write a servlet for printing My first servlet Program.	0.2	0.1
3	Write an Application program /Applet to create a table and insert the values in database using JDBC API	0.2	
4	Write an Application program /Applet to impliment DML on database using JDBC API	0.2	
5	Write an Application program /Applet to fetch the data from database and create a user defined report database using JDBC API	0.2	
6	Write a servlet for demonstrating the generic servlet class.	0.2	
7	Write a servlet to demonstrate the Http Servlet class using do Get ().	0.2	0.1
8	Write a servlet to demonstrate the Http Servlet class using do Post ().	0.2	0.1

Recommended text Books:
1. Deitel and Deitel, Java, How to Program, Pearson Education Asia.
2. C. Thomas Wu, An Introduction to OOP with Java, Mc Graw Hill.

Reference Books:

1. Cay S. Horstmann and Gary Comell, Core Java, Pearson Education Asia.

Data Ware Housing and Data Mining

Course Outcomes: Modeling and design of data warehouses. - Algorithms for data mining. Skills: - Be able to design data warehouses. - Ability to apply acquired knowledge for understanding data and select suitable methods for data analysis.

UNIT I (Basics of Data Warehouse) (2-0-0)

Theory (2 Credits)

Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Warehouse and OLAP Technology for Data Mining, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology From Data Warehousing to Data Mining.

UNIT II (DATA PREPROCESSING, LANGUAGE,ARCHITECTURES,KDD) (2-0-0)

Theory (2 Credits)

Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, Online Data Storage. Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems. Concepts Description: Characterization and Comparison: Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.

UNIT III (CLASSIFICATION & CLUSTERING) (2-0-0)

Theory (2 Credits)

Mining Association Rules in Large Databases: Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis. Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining. Cluster Analysis Introduction: Types of Data in Cluster Analysis, Partitioning Methods, Density-Based Methods, Grid-Based Methods,

Recommended Text Books:

1. Jiawei Han and Micheline Kamber, "Data Mining : Concepts and Techniques", Harcourt India Private Limited, First Indian Reprint,2001
2. Margaret H. Dunham, "Data Mining : Introductory and Advanced Topics", Pearson Education, First Indian Reprint,2003

Reference Books:

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.
2. Data Mining: Introductory and Advanced Topics- Margaret H.Dunham, S.Sridhar
3. Data Warehousing in the Real World,- Sam Anahory, Dennis Murry, Pearson Education.
4. The Data Ware House Toolkit – Ralph Kimball

Cognitive Psychology

Course Outcomes: On completion of the course, the student will have: Advanced theoretical, empirical and applied knowledge of basic mental processes from a cognitive perspective. Knowledge of quantitative research methods used in cognitive psychology.

UNIT I (history of the cognitive approach) (2-0)
Theory **(2 Credits)**

A Brief history of the cognitive approach, cognitive science, Neuro science, Artificial intelligence, The Parallel processing approach. Perceptual Process: Perception, pattern recognition, theories of pattern recognition, Bottom-up vs Top-down Processing, Template matching, feature analysis, prototype matching, pattern recognition: The role of the perceives.

UNIT II (Communication and Language Processing) (2-0)
Theory **(2 Credits)**

Communication and Language Processing: Linguistic Hierarchy, Chomsky's theory of grammer, Psycho-linguistic aspects, Abstraction of linguistic ideas, knowledge and comprehension, non-verbal abstraction – musical syntax, The language of motion. Memory Modules: Memory, process, storage, Short term memory, long term memory, organization in memory, simulation modules of learning and memory, mnemonics, syntactic and semantic issues, Concept formation, problem solving.

UNIT III (Contribution of cognitive psychology) (2-0-0)
Theory **(2Credits)**

Contribution of cognitive psychology to advances in Artificial Intelligence, computer based learning/teaching systems, knowledge acquisition and knowledge based systems, expert systems.

Recommended text Books:

1. Marc de May, "The cognitive Paradigm", Reidel, 1982

Reference Books:

1. R. C. Shank, P. Childers, "Cognitive computer on language, Learning and AI", 1984
2. P.C. Kendall, "Advances in Cognition behavioural research and therapy", Academic Press, 1984.
3. Solso, R.L. "Cognitive Psychology (3rd Edition), 1991, Allyn & Balon.
4. Matlin M.W., "Cognition (3rd Edition), 1995, Harcourt Brace (Prism Indian Edition).
5. Leahey T.H. & Harris R.J., "Learning and Cognition (4th Edition), 1997, PHI.

Digital Electronics

Course Outcomes: Became familiar with the digital signal, positive and negative logic, Boolean algebra, logic gates, logical variables, the truth table, number systems, codes, and their conversion from to others.

UNIT –I (2-0.4-0.2)
(Theory 2 Credit)
Review of Number Systems & Logic Gates, Non Functional Properties of Logic gates: Minimization Techniques: Using Boolean identities
Lab Experiments: (Practical 0.4 Credit)
(Practice 0.2 Credit)
1. Study of AND, OR, NOT gates and comparison with discrete components. (0.2 Practical) (0.1 Practice)
2. Design of different types of gates using Universal logic gates. (0.2 Practical) (0.1 Practice)
   (a) AND gate (b) OR gate (c) NOT gate (d) EX-OR gate (e) EX-NOR gate.

UNIT-II (2-0.3-0.7)
(Theory 2 Credit)
Karnaugh Map, Map entered variables, Quine-McCluskey method. Combinational Circuits: Adder, Subtractor, Encoder, Decoder, Tristate, Multiplexer, Demultiplexer, Parity checker & generator.
Lab Experiments: (Practical 0.3 Credit)
(Practice 0.7 Credit)
   1. De-Morgan's Theorem.
   2. Half adder and full adder circuits.
   3. Multiplexer/ Demultiplexer combinational logic circuit.

UNIT-III (1-0-0)
(Theory 1Credit)
Fundamental concepts of sequential logic: Introduction, Synchronous and Asynchronous operation, Latches, Flip Flops,

Recommended Text Books

1. Sandige – Modern Digital Design – MGH
2. Kohavi, Switching and Automata Theory

References Books

1. Bartee T.C. Digital Electronics, TMH
2. Moris-Mano- Digital Electronics
3. Parag K. Lala, Practical Digital Logic Design and Testing – PHI

Multimedia and Animation

Course Outcomes: It involves the advanced study of graphics, special visual effects, sound effects, software technologies that helps the students to learn how to transform reality into virtual imagination.

UNIT- I (Introduction) (2-0.8-0.2)
Theory (2 Credits)

Introduction to Multimedia and animation, Multimedia Systems, Design Fundamentals, Elements of multimedia and animation and their use, Back ground of Art, Color theory overview, Sketching & illustration, Storyboarding, different tools for animation.

Multimedia Projects: Multimedia Skills, Hardware, Use of Graphics in Multimedia, Overview of Vector and Raster Graphics, Basic software tools, Multimedia Authoring Tools, Planning and Costing, Designing and Producing, Contents and talent, Delivering, Enhancing and Testing Multimedia Projects.

Practical: (0.8 Credit)   Practice   **(0.2 Credit)**

1. Procedure to create an animation to represent the growing moon. **(0.2 Credit)**
2. Procedure to create an animation to indicate a ball bouncing on steps. **(0.2 Credit)**
3. Procedure to simulate movement of a cloud. **(0.2 Credit)**
4. Procedure to draw the fan blades and to give proper animation. **(0.2 Credit)**

UNIT- II (Tools of Multimedia) (1.5-1.2-0.8)
Theory   **(1.5 Credits)**
Tools of Multimedia: Paint and Draw Applications, Graphic effects and techniques, Image File Format, Anti-aliasing, Morphing, Multimedia Authoring tools, professional development tools.

Practical:(1.2)   Practice   **(0.8 Credit)**

1.   Procedure to display the background given (filename: tulip.jpg) through your name. **(0.2 Credit)**
2.   Procedure to display the background given (filename: garden.jpg) through your name using mask. **(0.2 Credit)**
3.   Procedure to create an animation with the following features. WELCOME (Letters should appear one by one .The fill color of the text should change to a different colour after the display of the full word.) **(0.2 Credit)**
4.   Procedure to simulate a ball hitting another ball. **(0.2 Credit)**
5.   Procedure to design a visiting card containing at least one graphic and text information. **(0.2 Credit)**
6.   Procedure to take a photographic image. Give a title for the image. Put the border. Write your names. Write the name of institution and place. **(0.2 Credit)**

UNIT- III (Animation) (2-0.8-0.2)
Theory   **(2 Credits)**
Animation: Introduction and Principles of Animations, Power of Motion, Animation Techniques, Animation File Format, Making animation for Rolling Ball, making animation for a Bouncing Ball, Animation for the web, GIF, Plugins and Players, Animation tools for World Wide Web.

Practical:(0.8 Credit)   Practice(0.2 Credit)

1.   Procedure to prepare a cover page for the book in your subject area. Plan your own design **(0.2 Credit)**
2.   Procedure to extract the flower only from given photographic image and organize it on a background. Selecting your own background for organization. **(0.2 Credit)**
3.   Procedure to change a circle into a square using flash. **(0.2 Credit)**
4.   Procedure to display the background given (FILENAME: GARDEN.JPG) through your name using mask **(0.2 Credit)**

Textbook:

1. Ze-Nian Li and Mark S. Drew, " Fundamentals of Multimedia", PHI, New Delhi
2. Multimedia: Making It Work (4th Edition) – by Tay Vaughan, Tata Mcgraw Hills.

Reference Books:

1.   Buford, "Multimedia Systems", Addison Wesley.
2.   Tay Vaughan, "Multimedia, Making IT Work",Tata McGraw Hill
3.   Sleinreitz, "Multimedia System", Addison Wesley.
4.   Ze-Nian Li and Mark S.Drew, "Fundamentals of Multimedia", Pearson Education
5.   Prabhat K Andleigh, Kiran Thakrar, "Multimedia systems design", PHI Learning Private Limited, Delhi India.
6.   Elsom Cook – "Principles of Interactive Multimedia" ,Tata McGraw Hill.

IV- SEMESTER
Sub: Advance Database Management System

Course Outcomes: Knowledge: The candidate will get knowledge of: - Query optimization. - Parallel and distributed database systems. - New database architectures and query operators. Skills: - Be able to develop new methods in databases based on knowledge of existing techniques.

UNIT I (Introduction to Data Base Systems) (1.5-0.5-0)
Theory (1.5 Credits)
Introduction: Database & Database Users. Characteristics of the Database, Approach advantages of using DBMS. Data Models, Schemas & Instances. DBMS Architecture & Data Independence. System Architecture for DBMS and Data Dictionary, Database Users Data Base languages & Interfaces. Data Modeling using the Entity-Relationship Model -Entity types, Entity Sets, Attributes and Keys, Relationship, Relationship Types, Week Entity Types, Structural Constraints, Enhanced ER Model- Specialization Generalization.

Practical (0.5 Credits)
1. Exercise based on Database creation & related queries.   (0.1 Practical)
2. Alteration of an existing database   (0.1 Practical)
3. Deletion of existing tables from a particular database.   (0.1 Practical)
4. Implementation of query language with insertion, Selection & Updating of database tables   (0.2 Practical)

UNIT II (Relational Model and Normalization) (2-0.8-0)
Theory (2 Credits)
Relational Data Model Concepts and Constraints. Relational Algebra - select, project, set theoretic, join operations. Overview of Relational Calculas. SQL – A Relational Database Language. Data Definition commands, View and Queries, transaction commands, Specifying Constraints & Indexes in SQL. Relational Data Base Design: Function Dependencies & Normalization for Relational Databases. Informal design guidelines for relation schemas, Functional Dependencies. Normal forms based on primary keys (INF, 2NF, 3NF& BCNF). Lossless join & Dependency preserving decomposition. Multi-valued dependencies, join dependencies (4NF & 5NF), Denormalization.

Practical (0.8 Credit)
1. Execution of several query statements that includes following operations:
    Deletion of a record Basic data retrieval   (0.1 Practical)
2. Execution of several query statements that includes Condition specification
                                                                      (0.1 Practical)
3. Execution of several query statements that includes following operations: (0.2Practical)
    Arithmetic Operators
    Aggregate Operators
4. Retrieval of records through multiple tables   (0.1 Practical)

UNIT III (Concurrency Control, Transaction and Security) (2-0.8-0)
Theory   (2 Credits)
Security & Integrity: Basic concept; ACID properties; transaction state; implementation of atomicity anddurability; concurrent executions; basic idea of serializability; view and conflict serializabllity Recovery Techniques Failure Classification , Storage Structure, Recovery and Atomicity Log Based Recovery, Shadow Paging ,stable storage implementation, data access; recovery and atomicity - log based recovery, deferred database modification, immediate database modification, checkpoints.

Practical	**(0.8 Credit)**

1. Join operation on multiple tables.   (0.2 Practical)
2. Set manipulation on records through following operations:
   - any, in, all,   (0.2 Practical)
   - contains. not contains, exists,   (0.2 Practical)
   - not exists, union, minus, intersect.   (0.2 Practical)

Recommended Text Books:
1. Elmsari and Navathe, "Fundamental of Database System", AddisonWesley. New York.
2. H.Korth & A. Silberschatz, "DATABASE SYSTEM CONCEPTS", TMH.

Reference Books:
1. Date. CJ, "An Introduction to Database System", Narosa Publishing House. New Delhi.
2. Desai, B, "An Introduction to Database Concepts", Galgotia Publications. New Delhi.

Sub : Artificial Intelligence & Applications

Course Outcomes: Upon successful completion of the course, the students will be able to Solve basic AI based problems. Define the concept of Artificial Intelligence. Apply AI techniques to real-world problems to develop intelligent systems.

UNIT I (Introduction to Artificial Intelligence) (2-0-0)

Theory	**(2 Credits)**

Introduction to Artificial Intelligence- What is AI? ,Early work in AI,AI and related fields, AI problems and Techniques, Problems, Problem Spaces and Search-Defining AI problems as a State Space, Search: example, Production Systems, Search and Control Strategies, Problem Characteristics Issues in Design of Search Programs, Additional Problems, Heuristic Search Techniques-Generate-and-test, Hill Climbing, Best First Search, Problem Reduction, Constraint Satisfaction, Mean-Ends Analysis

UNIT II (Knowledge Representation) (2-0-0)

Theory	**(2 Credits)**

Knowledge Representation-Representations and Mappings, Approaches to Knowledge,
Representation, Knowledge representation method, Propositional Logic, Predicate logic, Representing Simple facts in Logic, Representing Instances and Isa, relationships, Computable Functions and Predicates, Resolution, Forward and backward chaining, Slot – and – Filler Structures

UNIT III (Game Playing) (2-0-0)

Theory	**(3 Credits)**

Game Playing- Minimax Search Procedures, Adding alpha-beta cutoffs, Planning, An example Domain: The Blocks world, Component of a planning system, Goal state planning, Nonlinear planning
Hierarchical Planning, Natural Language Processing- Introduction, Syntactic Processing, Semantic analysis, Discourse and Pragmatic Processing, Learning, What is learning, Rote Learning, Learning by taking advice, Learning in problem solving, Learning from examples, Explanation based learning

Recommended Text Books:
1. Elaine Rich and Kevin Knight: Artificial Intelligence – Tata McGraw Hill.
2. Dan W.Patterson, Introduction to Artificial Intelligence and Expert Systems – Prentice Hal of India.

Reference Books:
1. Nils J. Nilsson: Principles of Artificial Intelligence – Narosa Publication house.
2. Artificial Intelligence : A Modern Approach, Stuart Rusell, Peter Norving, Pearson Education 2nd Edition.
3. Artificial Intelligence, Winston, Patrick, Henry, Pearson Education.
4. Artificial Intelligence by Gopal Krishna, Janakiraman.

Network programming

Course Outcomes: demonstrate advanced knowledge of networking. understand the key protocols which support the Internet. be familiar with several common programming interfaces for network communication. demonstrate advanced knowledge of programming for network communications. have a detailed knowledge of the TCP/UDP Sockets.

UNIT I (Basics of TCP Sockets) (1.5-0.5-0)

ELEMENTARY TCP SOCKETS Introduction to Socket Programming – Overview of TCP/IP Protocols –Introduction to Sockets – Socket address Structures – Byte ordering functions – address conversion functions – Elementary TCP Sockets – socket, connect, bind, listen, accept, read, write, close functions – Iterative Server – Concurrent Server.
Practical (1 Credit)
UNIT II (TCP Echo Server-Client)(2-0.5-0)

APPLICATION DEVELOPMENT TCP Echo Server – TCP Echo Client – Posix Signal handling – Server with multiple clients – boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown – I/O multiplexing – I/O Models – select function – shutdown function – TCP echo Server (with multiplexing) – poll function – TCP echo Client (with Multiplexing)
Practical (1 Credit)
UNIT III (TCP Echo Server-Client)(1.5-0.5-0)

SOCKET OPTIONS, ELEMENTRY UDP SOCKETS Socket options – getsocket and setsocket functions – generic socket options – IP socket options – ICMP socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – threaded servers – thread creation and termination – TCP echo server using threads – ping program – trace route program.
Practical   **(1 Credit)**

Recommended text BOOKS

1. W. Richard Stevens, "UNIX NETWORK PROGRAMMING Vol-I" Second Edition, PHI / Pearson Education, 1998.
2. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", Third Edition, Addison Wesley, 1999.

REFERENCE BOOKS

1. D.E. Comer, "Intrenetworking with TCP/IP Vol- III", (BSD Sockets Version), second Edition, PHI, 2003.

Microprocessor

Course Outcomes: At the end of the course, a student will be able to:
Assess and solve basic binary math operations using the microprocessor and explain the microprocessor's and Microcontroller's internal architecture and its operation within the area of manufacturing and performance. Apply knowledge and demonstrate programming proficiency using the various addressing
modes and data transfer instructions of the target microprocessor and microcontroller.Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.Analyze assembly language programs; select appropriate assemble into machine a cross
assembler utility of a microprocessor and microcontroller. Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to
external devices.

UNIT-I (2-1.6-0)
(Theory 2Credit)

The 8085 Microprocessor: Block diagram, pins & their description, demultiplexing of buses, control signals & flags. Introduction to 8085 based microcomputer system.Instruction & Timings: Instruction classification, instruction formats, addressing modes, Instruction timings and status, Interrupts.

Lab Experiments: (Practical 1.6 Credit)

1. Study the hardware, functions, memory structure and operation of 8085 microprocessor kit. (0.8 Practical)
2. Program to perform integer division: (i) 8-bit by 8-bit (ii) 16-bit by 8-bit. (0.4 Practical)
3. Transfer of a block of data in memory to another place in memory in the direct and reverse order. (0.4 Practical)

UNIT-II (2-0.8-0)

(Theory 2Credit)

Programming & Programming Techniques of the 8085: 8085instruction set, data transfer instructions, arithmetic, logic & branch operations. Rotate & compare. Instructions related to stack operations. Looping, counting and indexing, counters & time delays. Subroutines, Interfacing Concepts & Peripherals: Basic interfacing concepts. Memory mapped and peripheral mapped I/O. Description, programming & interfacing of 8155, 8255, 8279 with 8085. Description of simple systems using above chips. Description, programming and interfacing of 8253 and 8259A with 8085 microprocessor.

Lab Experiments: (Practical 0.8 Credit)

1. Searching a number in an array and finding its parity. (0.2 Practical)
2. Sorting of array in: (i) Ascending (ii) Descending order. (0.2 Practical)
3. Program to perform following conversion: (i) BCD to ASCII (ii) BCD to Hexadecimal (0.2 Practical)
4. Program to multiply two 8-bit numbers.   (0.2 Practical)

UNIT-III (1-0.7-0)

(Theory 1Credit)

Direct memory Access: Basic concepts f DMA techniques. Description, Programming and interfacing of DMA controller 8257.A/D and D/A converters, Serial I/O & Bus stands: Interfacing of AD558, AD7522, ADC0801, 0808 with 8085. Basic concepts in serial I/O, Software controlled serial I/O. RS232C and standard parallel port of PC.

Lab Experiments: (Practical 0.7 Credit)

1. Program to generate and sum 15 Fibonacci numbers. (0.3 Practical)
2. Program for rolling display of message "INDIAN". (0.2 Practical)
3. To insert a number at correct place in a sorted array. (0.2 Practical)

Recommended Text Books

1. P. Mathur Introduction to Microprocessors

References Books:

1. Gaonkar- Microprocessors
2. V. Hall- Microprocessor & Interfacing

WEB INTELLIGENCE, HADOOP AND BIG DATA ANALYSIS

Course Outcomes: The students will be able to:
Identify Big Data and its Business Implications. List the components of Hadoop and Hadoop Eco-System. Access and Process Data on Distributed File System. Manage Job Execution in Hadoop Environment.

UNIT I – INTRODUCTION TO INTELLIGENT WEB and LISTEN AND LOAD (1.5-0.4-0)
Theory   **(1.5Credits)**
Inside the search engine - Examples of intelligent web applications - Basic elements of intelligent applications - Machine learning, data mining – Searching, Reading, indexing, and searching. Streams, Information and Language, - Statistics of Text - Analyzing Sentiment and Intent – Load - Databases and their Evolution, Big data Technology and Trends.

Practical   **(0.4 Credits)**

S.No.	Name of Practical	Practical	Practice
1	A practical approach for how SEM works	0.2	
2	Configure and deploy a single instance topology	0.2	

UNIT II – Clustering and generic Methods (1.5-1-0)
Theory   **(1.5 Credits)**
Data structures in Java: Linked List, Stacks, Queues, Sets, Maps; Generics: Generic classes and Type parameters, Implementing Generic Types, Generic Methods, Wrapper Classes, Concept of Serialization An overview of clustering algorithms - Clustering issues in very large datasets - The need for classification .

Practical   **(1 Credits)**

S.No.	Name of Practical	Practical
1	Implement the following Data structures in Java a)Linked Lists b) Stacks	0.2
2	Implement the following Data structures in Java a)Queues b) Set c) Map	0.2
3	Increase data capacity of the cluster	0.2
4	Increase data availability of the cluster	0.2
5	Write a program on collections in java	0.1
6	Write a program by using generic methods	0.1

UNIT III – Introduction of HADOOP (2-0.6-0)
Theory   **(2 Credits)**

Working with Big Data: Google File System, Hadoop Distributed File System (HDFS) – Building blocks of Hadoop(Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker), Introducing and Configuring Hadoop cluster (Local,Pseudo-distributed mode, Fully Distributed mode), Configuring XML files

Practical   **(0.6 Credits)**

S.No.	Name of Practical	Practical
1	Perform setting up and Installing HADOOP in its three operating modes: • Standalone • Pseudo distributed • Fully distributed.	0.2
2	Use web based tools to monitor your HADOOP setup.	0.2
3	Iimplement the following file management tasks in HADOOP • Adding files and directories • Retrieving files • Deleting files	0.2

Recommended text Books:

1. Gautam Shroff, "Intelligent Web - Search, Smart Algorithms, and Big Data", Oxford University Press, 2013.
2. Haralambos Marmanis, Dmitry Babenko, "Algorithms of the Intelligent Web", Manning publications, 2009.
3. hristopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, "An Introduction to Information Retrieval", Cambridge University Press, 2009.
4. Mark Gardener, "Beginning R - The Statistical Pr ogramming Language", John Wiley & Sons, Inc., 2012.
5. Big Java 4th Edition, Cay Horstmann, Wiley John Wiley & Sons, INC
6. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly Hadoop in Action by Chuck Lam, MANNING Publ.

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VI – SEMESTER

Sub: Cryptography & Network Security
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Course Outcomes: Analyze and design classical encryption techniques and block ciphers. Understand and analyze data encryption standard. such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc. Protocols.

Unit-I (Conventional and Modern Encryption) (2-0-0)
Theory
(2 Credits)
Model of network security – Security attacks, goals of security- prevention, detection and recovery.,services and attacks – OSI security architecture – Classical encryption techniques – SDES – Block cipher Principles- DES – Strength of DES - Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – RC5 - Differential and linear crypto analysis – Placement of encryption function – traffic confidentiality

Unit-II (Public Key Encryption & Authentication) (2-0-0)
Theory
(2 Credits)
Number Theory – Prime number – Modular arithmetic – Euclid's algorithm - Fermet's and Euler's theorem – Primality – Chinese remainder theorem – Discrete logarithm – Public key cryptography and RSA – Key distribution – Key management – Diffie Hellman key exchange – Elliptic curve cryptography.
Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – MD5 – SHA - HMAC – Digital signature and authentication protocols – DSS

Unit-III (System Security) (2-0-0)
Theory
(2 Credits)
Authentication applications – Kerberos – X.509 Authentication services - E-mail security – IP security - Web security Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security

Recommended Text Books:

1. William Stallings, "*Cryptography & Network Security*", Pearson Education, 4th Edition 2006.

Reference Books:
1.   D.R. Stinson, *Cryptography - Theory and practice*, CRC Press.
2.   A.J. Menezes, P.C. van Oorschot and S.A. Vanstone, *Applied Cryptography*, CRC Press.
3.   B Schneier, *Applied Cryptography*, Wiley. ISBN 0-471-11709-9
4.   C. Kaufman, R. Perlman, *Network Security*, Prentice Hall.
5.   RICK LEHTINEN, G.T. GANGEMI, SR., "Computer Security Basics, Second Edition", O'Reilly Pubs, June 2006
6.   STEPHEN NORTHCUTT, KAREN KENT, LENNY ZELTSER, "Inside Network Perimeter Security", Sams Pubs 2005

Computer Graphics

Course Outcomes: The course introduces the basic concepts of computer graphics. It provides the necessary theoretical background and demonstrates the application of computer science to graphics. The course further allows students to develop programming skills in computer graphics through programming assignments.

Unit I (Application areas of Computer Graphics) (1.7-0.8-0.2)
Theory (1.7 Credits)
Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood-fill algorithms
Practical (0.8 Credits)
Practice (0.2 Credits)

Program for Line Drawing Algorithm.	(0.2 Practical)	(0.1 Practice)
Program for mid point circle Algorithm.	(0.2 Practical)	(0.1 Practice)
Program for ellipse Algorithm.	(0.2 Practical)	
Program for Boundary Fill Algorithm.	(0.1 Practical)	
Program for Flood Fill Algorithm.	(0.1 Practical)	

Unit II (2-D geometrical transforms) (2-1.1-0.4)
Theory
(2 Credits)
2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms 2-D viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm
Practical
(1.1 Credits)
Practice
(0.4 Credits)

Program for 2D translation.	(0.2 Practical)	(0.1 Practice)
Program for 2D scaling.	(0.2 Practical)	
Program for 2D rotation.	(0.2 Practical)	
Description of line clipping.	(0.1 Practical)	
Program for Cohen-Sutherland line Clipping.	(0.2 Practical)	(0.2 Practice)
Program for window to viewport transformation.	(0.2 Practical)	(0.1 Practice)

Unit III (3-D object representation) (2-0.5-0.3)
Theory
(2 Credits)
3-D object representation: Polygon surfaces, spline representation, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces, polygon-rendering methods. 3-D Geometric transformations; 3-D viewing: Viewing pipeline, viewing coordinates, parallel & perspective projections, Visible surface detection methods: Classification, back-face detection, depth buffer, A-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division
Practical (0.5 Credits)

Program for 3D Translation.	(0.2 Practical)
Program for scaling of a triangle.	(0.2 Practical)
Program, for translation of a circle.	(0.1 Practical)

Practice (0.3 Credits)
Practice of 2D and 3D rotation, scalling and translations and visible surface detection algorithms (A-buffer, Depth buffer)
Recommended Text Books:
1. "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson Education
Reference Books:

1. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
2. "Computer Graphics Principles & practice", Second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.

Advanced Web Technologies

Course Outcomes: At the end of the course the student should be able to:
Define the fundamental ideas and standards underlying Web Service Technology. define the fundamental principles for cloud applications. discuss concepts at the frontier of industrial practice and emerging standards

UNIT I (Installation and configuration of MySQL and Concepts of PHP) (2-1-0.5)
Theory
   (2 Credits)
Installing and Configuring: Current Versions of MySQL and PHP, Installing MySQL and PHP on Windows, php.ini. Basics, The Basics of PHP scripts. The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments. Working with Arrays: Creating Arrays, Some Array-Related Functions.

Practical (1 Credit)
Practice (0.5 Credit)
1. Exercise based on PHP Variables, String, Operators   (0.2 Practical) (0.1 Practice)
2. Exercise based on PHP If...Else, Switch,   (0.2   Practical) (0.1 Practice)
3. Exercise based on PHP Arrays   (0.2   Practical) (0.1 Practice)
4. Exercise based on PHP Looping   (0.2   Practical) (0.1 Practice)
5. Exercise based on several PHP Functions,   (0.2   Practical) (0.1 Practice)

UNIT II (Objects and Forms) (2-1.2-0.6)
Theory
(2 Credits)
Working with Objects: Creating Objects, Object Instance Working with Strings, Dates and Time: Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP. Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads.

Practical (1.2 Credit)

Practice (0.6 Credit)

1. Exercise based on Forms, (0.2 Practical) (0.1 Practice)
2. Exercise based on $_GET, (0.2 Practical) (0.1 Practice)
3. Exercise based on $_POST (0.2 Practical) (0.1 Practice)
4. Exercise based on PHP Date, Include function, (0.2 Practical) (0.1 Practice)
5. Exercise based on state management through Cookies, (0.2 Practical) (0.1 Practice)
6. Exercise based on Sessions (0.2 Practical) (0.1 Practice)

UNIT III (MySQL) (2-0.4-0.3)

Theory (2 Credits)

Learning the MySQL Data types, Learning the Table Creation Syntax, Using Insert Command, Using SELECT Command, Using WHERE in your Queries, Selecting from Multiple Tables, Using the UPDATE command to modify records, Using the DELETE Command, Frequently used string functions in MySQL, Using Date and Time Functions in MySQL. Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

Practical (0.4 Credit)

Practice (0.3 Credit)

1. Exercise based on PHP Database: (0.2 Practical) (0.1 Practice)
    i. MySQL Connect,
    ii. MySQL Create,
    iii. MySQL Insert,
    iv. MySQL Select, Where, Order By,
    v. MySQL Update,
    vi. MySQL Delete
2. Small web based application which demonstrate the Client-Server based transaction.
(0.2 Practical)

Recommended Books:
1. Sams Teach Yourself PHP in 24 Hours, Third Edition
2. Wrox, Beginning PHP, Apache, MySQL Web Development
3. Wrox, Beginning PHP

Suggested Readings:
1. Programming PHP, By Rasmus Lerdorf, Kevin Tatroe, O'Reilly
2. PHP Developer's Cookbook, By Sterling Hughes, Publisher: Sams Publishing
3. PHP 5 For Dummies, by Janet Valade, Wiley Publishing, Inc.

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Cloud Computing

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Course Outcomes: Understand the concepts, characteristics, delivery models and benefits of cloud computing. Understand the key security and compliance challenges of cloud computing. Understand the key technical and organisational challenges.

UNIT I (Introduction to Cloud Computing, Virtualization): (2-0-0)

**Theory
(2 Credits)**
What is cloud? Services provided by cloud are categorized :Software As a Service(SaaS) ,Infrastructure As a Service(IaaS) ,Platform As a Service(PaaS) ,Desktop As a Service (DaaS) and VDI etc. How Cloud Computing Works, Advantages & Disadvantages, and Applications for Businesses Cloud Service Providers.Brief overview of major Cloud Service providers – Amazon AWS, Google App Engine, Microsoft, VMware. How Companies are using Cloud Computing Cloud Computing Risks and IssuesVirtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS (Hypervisor), HA/DR using Virtualization Live Migration of VMs, SAN backend concepts, S/W defined Networking (OpenFlow/OpenVSwitch), S/W Defined Datacenter, S/W Defined Storages. Virtualization for Enterprise

- ➢ VMware
- ➢ Xen
- ➢ KVM with oVirt
- ➢ Hyper-V

UNIT II (Private, Public & Hybrid Clouds, Setting up your own Cloud): (2-0-0)

**Theory
(2 Credits)**
What is Private, Public & Hybrid Clouds, and Advantages & Disadvantages On Premises and Off Premises Cloud services, installing a Cloud service using • Eucalyptus • Open Nebula • Open Stack Amazon Web Services Microsoft Azure Google App Engine VMware air.

Setting up your own Cloud

How to build private cloud using open source tools Understanding various cloud plugins, Setting up your own cloud environment Auto provisioning Custom images Integrating tools like Nagios Integration of Public and Private Cloud.

UNIT III (Cloud Security): (2-0-0)
Theory (2 Credits)
• Infrastructure Security • Network level security, Host level security, Application level security • Data security and Storage • Data privacy and security Issues, Jurisdictional issues raised by Data location • Identity & Access Management • Access Control • Trust, Reputation, Risk • Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business consideration.
Security in Clouds: Cloud security challenges – Software as a Service Security
Project Work
- ➢ Designing of sample cloud services.
- ➢ Case Study of sample cloud services

Recommended Text Books:
2. **Cloud Computing: Web Based Applications** That Change The Way You Work And Collaborating Online, **By Michael Miller**
Suggested Readings:
1. Barrie Sosinsky,**Cloud Computing Bible**
2. *Robin Bloor*, *Marcia Kaufman*, and *Fern Halper,* **Cloud Computing for Dummies**

Organizational Behavior

Credits: 5.5

Course Outcomes: The course aims to provide an understanding of basic concepts, theories and techniques in the field of human behaviour at the individual, group and organizational levels in the hanging global scenario. The course must be taught using case study method.

UNIT I
- Introduction: Concept and nature of Organizational behaviour; Contributing disciplines to the field of O.B.;
- O.B. Models; Need to understand human behaviour; Challenges and opportunities.
- Individual & Interpersonal Behaviour: Biographical Characteristics; Ability; Values;
- Attitudes- Formation, Theories, Organization Related Attitude, Relationship between Attitude and Behavior;
- Personality – Determinants and Traits; Emotions;

(Credits :2)

UNIT II
- Learning-Theories and Reinforcement Schedules, Perception –Process and Errors.
- Interpersonal Behaviour: Johari Window; Transactional Analysis – Ego States, Types of Transactions, Life Positions, Applications of T.A.
- Group Behaviour & Team Development: Concept of Group and Group Dynamics; Types of Groups;
  - Formal and Informal Groups; Stages of Group Development, Theories of Group Formation; Group Norms, Group Cohesiveness;

(Credits :2)

UNIT III
- Group Think and Group Shift. Group Decision Making; Inter Group Behaviour;
- Concept of Team Vs. Group; Types of Teams; Building and Managing Effective Teams.
- Organization Culture and Conflict Management: Organizational Culture- Concept, Functions,
- Socialization; Creating and sustaining culture; Managing Conflict – Sources, Types, Process and Resolution of Conflict;
- Managing Change; Resistance to Change, Planned Change. Managing Across Cultures; Empowerment and Participation.

(Credits :1.5)

Recommended Text Book
- Robbins, S.P. and Sanghi, S., (2009), Organizational Behaviour; 13th edition, Pearson Education.
- Singh, Kavita, (2010), Organizational Behaviour: Text and Cases, 1st edition, Pearson Education.

Suggested Readings:
- Luthans, Fred, (2008), Organizational Behavior, 11th Edition, McGraw Hill Education.
- Mcshane, Steven, Von, Glinow and Sharma, Radha, (2008), Organisational Behaviour, 4th Edition, McGraw Hill Education.
- Kinicki, Angelo and Kreitner, Robert, ((2005)), Organisational Behaviour, 2nd Edition, McGraw Hill Education.

Recommendation:
- **One Existing case Analysis learning & one Current case Analysis on groups beahviour**
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(Credits :1)