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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
M.Tech (CSE)
COURSE STRUCTURE

I Year – I Semester

S.No.	Course code	Subject	L	T	P	CP
1.	16CS5801	Object Oriented Software Engineering	4	0	-	4
2.	16CS5802	Advanced Computer Networks	4	0	-	4
3.	16CS5803	Programming in Python	4	0	-	4
4.	16CS5804	Advanced Data structures and Algorithms	4	0	-	4
5.	16CS5805	Cyber Crime Investigations and Digital Forensics	4	0	-	4
		ELECTIVE-I				
6.	16CS5806	Advances in Databases				
7.	16CS5807	Advanced Operating Systems	4	0	-	4
8.	16CS5808	Computer Vision				
		LABORATORY				
9.	16CS5809	Software Lab- 1 (Covering the experiments: PYTHON Tasks, Data structure tasks)	-	-	4	2
			24	0	4	
	Contact periods / week		Total/Week 28			26

I Year – II Semester

S.No.	Course code	Subject	L	T	P	CP
1.	16CS5810	Software Architecture and Design Patterns	4	0	-	4
2.	16CS5811	Cloud Computing	4	0	-	4
3.	16CS5812	Data Analytics	4	0	-	4
4.	16CS5813	Java & Web Technologies	4	0	-	4
5.	16CS5814	Object Oriented Analysis and Design	4	0	-	4
		ELECTIVE- II				
6.	16CS5815	Machine Learning				
7.	16CS5816	Distributed Systems	4	0	-	4
8.	16CS5817	Image Processing and Pattern Recognition				
		LABORATORY 1				
9.	16CS5818	Software Lab- 2 (Covering the experiments: JWT Tasks & UML Tasks)	-	-	4	2
			24	0	4	
	Contact Periods / Week		Total/Week 28			26

II YEAR (III & IV Semesters)

S. No	Subject Code	Subject	Credits
1	16CS5819	Seminar	2
2	16CS5820	Project Work	16

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5801) OBJECT ORIENTED SOFTWARE ENGINEERING

M.Tech I Year -I Sem. (CSE)   L   T   C
                                                     4   -   4

Course Objectives:

- To study about the concepts of object oriented software engineering
- To Study the Case studies to apply the principles

UNIT- I
INTRODUCTION:

Software Engineering Paradigm, Software Development process models - Project & Process - Project management – Process & Project metrics – Object Oriented concepts & Principles.

UNIT- II
PLANNING & SCHEDULING :

Software prototyping - Software project planning – Scope – Resources – Software Estimation - Empirical Estimation Models – Planning - Risk Management – Software Project Scheduling – Object Oriented Estimation & Scheduling.

UNIT- III
ANALYSIS & DESIGN :
Analysis Modeling - Data Modeling - Functional Modeling & Information Flow - Behavioral Modeling - Structured Analysis - Object Oriented Analysis – Domain Analysis - Object Oriented Analysis process - Object Relationship Model – Object Behavior Model. Design Concepts & Principles - Design Process – Design Concepts Modular Design – Design Effective Modularity - Introduction to Software Architecture - Data Design – Transform Mapping – Transaction Mapping – OOD - Design System design process - Object design process - Design Patterns.

UNIT- IV
IMPLEMENTATION & TESTING:
Top - Down , Bottom - Up , object oriented product Implementation & Integration. Software Testing methods - White Box, Basis Path - Control Structure – Black Box Unit Testing - Integration testing - Validation & System testing. Testing OOA & OOD models - Object oriented testing strategies.

UNIT- V
MAINTENANCE:
Maintenance process - System documentation - program evolution dynamics - Maintenance costs - Maintainability measurement – Case Studies

TEXT BOOKS:

1. Bernd Bruegge & Allen H. Dutoit, " Object Oriented Software Engineering ", 2009.
2. Ivar Jacobson, " Object - Oriented Software Engineering ", Pearson Education, 2009.

REFERENCES:

1. Stephen R. Schach, "Object - Oriented Classical Software Engineering ", McGraw Hill, 2010.
2. Yogesh Singh, "Object-Oriented Software Engineering", 2012.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5802) ADVANCED COMPUTER NETWORKS

M.Tech I Year -I Sem. (CSE)   L   T   C
                                                                         4   -   4

Course Objectives:

- To build a solid foundation in computer networks concepts and   design

- To understand computer network architectures, protocols, and interfaces.

- The OSI reference model and the Internet architecture network applications.

- Expose the concepts of traditional as well as modern day computer- networks -wireless and mobile, multimedia-based.

- Will understand the key concepts and practices employed in modern computer networking

UNIT- I:
Review Computer Networks and the Internet: History of Computer Networking and the Internet, Networking Devices, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones. **Networking Models:** 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM.

UNIT- II:
Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intra domain Routing Protocols, Inter domain Routing Protocols, Congestion Control at Network Layer. **Logical Addressing:** IPv4 Addresses, IPv6 Addresses -Internet Protocol: Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6 –**Multicasting Techniques and Protocols:** Basic Definitions and Techniques, Intra domain Multicast Protocols, Inter domain Multicast Protocols, Node-Level Multicast algorithms

UNIT- III:
Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs),**VPNs, Tunneling and Overlay Networks:** Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), Overlay Networks –VoIP and   **Multimedia Networking:** Overview of IP Telephony, VoIP Signaling Protocols, Real-Time   Media Transport Protocols, Distributed Multimedia Networking, Stream Control Transmission Protocol

UNIT- IV:
Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion   Control **Application Layer:** Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Socket Programming with TCP and UDP, Building a Simple Web Server

UNIT- V:

Mobile Ad-Hoc Networks: Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing Protocols for Ad-Hoc Networks –**Wireless Sensor Networks:** Sensor Networks and Protocol Structures, Communication Energy Model, Clustering Protocols, Routing Protocols

TEXT BOOKS:

1. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, Keith W.Ross, Third Edition, Pearson Education, 2007
2. Computer and Communication Networks, Nader F. Mir, Pearson Education, 2007

REFERENCES:

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill, 2007
2. Guide to Networking Essentials, Greg Tomsho, Ed Tittel, David Johnson, Fifth Edition, Thomson.
3. An Engineering Approach to Computer Networking, S.Keshav, Pearson Education.
4. Campus Network Design Fundamentals, Diane Teare, Catherine Paquet, Pearson Education (CISCO Press)
5. Computer Networks, Andrew S. Tanenbaum, Fourth Edition, Prentice Hall.
6. The Internet and Its Protocols, A.Farrel,Elsevier.
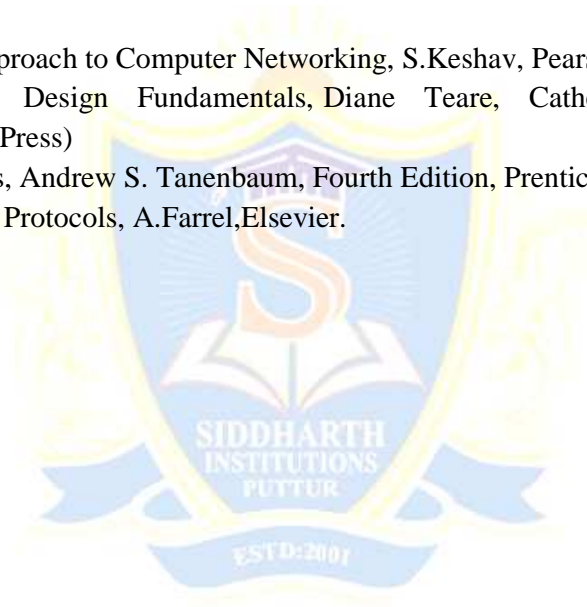
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5803) PROGRAMMING IN PYTHON

M.Tech I Year -I Sem. (CSE)   L   T   C
                                                                    4   -   4

Course Objectives:
- To learn basic syntaxes of Python
- To learn about classes and objects
- To learn about operations and expressions
- To learn about advanced concepts in Python

UNIT- I:

A Tutorial Introduction - Running Python - Variables and Arithmetic Expressions - Conditionals -File Input and Output - Strings - Lists - Tuples - Sets - Dictionaries - Iteration and Looping - Functions -Classes - Exceptions - Modules

Lexical Conventions and Syntax - Line Structure and Indentation - Identifiers and Reserved Words - Literals - Operators, Delimiters, and Special Symbols - Documentation Strings - Decorators - Source code Encoding

UNIT- II:

Types and Objects - Terminology - Object Identity and Type - Reference Counting and Garbage Collection - References and Copies - Built-in Types - The None Type - Numeric Types - Sequence Types - Mapping Types - Set Types - Callable Types - Classes and Types - Modules - Files - Internal Types - Classic Classes - Object Creation, Destruction, and Representation - Attribute Access - Sequence and Mapping Methods - Iteration - Mathematical Operations - Comparison Operations - Callable Objects Performance Considerations

UNIT- III:

Operators and Expressions - Operations on Numbers - Operations on Sequences - Operations on Dictionaries - Operations on Sets - Augmented Assignment - The Attribute (.) Operator - Type Conversion - Unicode Strings - Boolean Expressions and Truth Values - Object Equality and Identity Order of Evaluation - Control Flow-Functions and Functional Programming

UNIT- IV:

Classes and Object-Oriented Programming - The class Statement - Class Instances - Reference Counting and Instance Destruction - Inheritance - Polymorphism - Information Hiding - Operator Overloading - Types and Class Membership Tests - Classic Classes – Meta classes – Modules and Packages - Input and Output

UNIT- V:

The Python Library - Introduction to the Python Standard Library - Library Overview - Built-in Functions and Exceptions - Python Runtime Services – Mathematics - Data

Structures and Algorithms - String and Text Handling - Data Management and Object Persistence – File Handling – Threads - Network Programming

Text Books:
1. Python Essential Reference by David M Beazley – Third Edition, Sams Publishing
2. The Python Standard Library by Example - Developer's Library Doug Hellmann – Addison-Wesley.

Reference Books:
1. Steven Holzner, "PHP: The Complete Reference," McGraw-Hill Osborne, ISBN-13: 978-0071508544, 2008

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5804) ADVANCED DATA STRUCTURES AND ALGORITHMS

M.Tech I Year -I Sem. (CSE)   **L**   **T**   **C**
                                                    4   **-**   **4**

Course Objectives:

- The fundamental design, analysis, and implementation of basic data structures.
- Basic concepts in the specification and analysis of programs.
- Principles for good program design, especially the uses of data abstraction.
- Significance of algorithms in the computer field
- Various aspects of algorithm development
- Qualities of a good solution

UNIT- I: Overview of Data Structures
Review of Arrays, Stacks, Queues, linked lists, Linked stacks and Linked queues, Applications
Algorithm Analysis
Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs.

UNIT- II: Trees and Graphs
Introduction, Definition and Basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs-basic concepts, representation and traversals

UNIT- III: Binary Search Trees, AVL Trees and B Trees
Introduction, Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.
Red – Black Trees, Splay Trees and Hash Tables

Red – Black Trees, Splay Trees and its applications. Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

UNIT- IV: Divide – and – Conquer & Greedy Method
General Method, Binary Search, Finding Maximum and Minimum, Quick Sort,,Merge sort, Strassen's Matrix Multiplication, **Greedy Method-** General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT- V: Dynamic Programming
General Method, All Pairs Shortest Path, Single Source Shortest path ,0 / 1 Knapsack problem,, Traveling Sales Person's Problem,

Back Tracking and Branch – and – Bound
General Method, 8 – Queen's Problem, Graph Coloring. **Branch – and – Bound**: General method, LC Search, Bounding, 0 / 1 Knapsack Problem.

TEXT BOOKS:
1. Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.
2. Fundamentals of Computer Algorithms by Ellis Horowitz, SartajSahni and SanguthevarRajasekaran, 2nd edition, University Press.

REFERENCES:
1. Classic Data Structures by D. Samanta, 2005, PHI
2. Design and Analysis of Computer Algorithms by Aho, Hopcraft, Ullman 1998, PEA.
3. Introduction to the Design and Analysis of Algorithms by Goodman, Hedetniemi, TMG.
4. Design and Analysis of Algorithms by E. Horowitz, S. Sahani, 3rd Edition, Galgotia.
5. Data Structures and Algorithms in C++ by Drozdek 2nd Edition, Thomson.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5805) CYBER CRIME INVESTIGATIONS AND DIGITAL FORENSICS

M.Tech I Year -I Sem. (CSE)   **L   T   C**
                                                    4   -   4

Course Objectives:

- To learn about cyber crimes and how they are planned.
- To learn the vulnerabilities of mobile and wireless devices
- To learn about the crimes in mobile and wireless devices

UNIT- I
Introduction to Cybercrime: Introduction, Cybercrime and Information security, who are cybercriminals, Classifications of Cybercrimes, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.
Cyber offenses: How criminals Plan Them: Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing.

UNIT- II
Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies an Measures in Mobile Computing Era, Laptops.

UNIT- III
Cybercrimes and Cyber security: the Legal Perspectives: Introduction: Cyber Crime and Legal Landscape around the world, Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario In India, Digital signatures and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment, Cyber law, Technology and Students: Indian Scenario.

UNIT- IV
Understanding Computer Forensics
Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Chain of Custody concept, Network Forensics, Approaching a computer, Forensics Investigation, Challenges in Computer Forensics, Special Tools and Techniques, Forensics Auditing

UNIT- V

**Cyber Security: Organizational Implications**

Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

TEXT BOOKS:

1. Cyber Security: *Understanding Cyber Crimes, Computer Forensics and Legal Perspectives*, Nina Godbole and Sunil Belapure, Wiley INDIA.
2. Introduction to Cyber Security , Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group

REFERENCE BOOKS:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Nelson Phillips and Enfinger Steuart, "Computer Forensics and Investigations", Cengage Learning, New Delhi, 2009.
3. Kevin Mandia, Chris Prosise, Matt Pepe, "Incident Response and Computer Forensics ", Tata McGraw -Hill, New Delhi, 2006.
4. Robert M Slade," Software Forensics", Tata McGraw -Hill, New Delhi, 2005.
5. Bernadette H Schell, Clemens Martin, "Cybercrime", ABC –CLIO Inc, California, 2004.
6. "Understanding Forensics in IT ", NIIT Ltd, 2005.
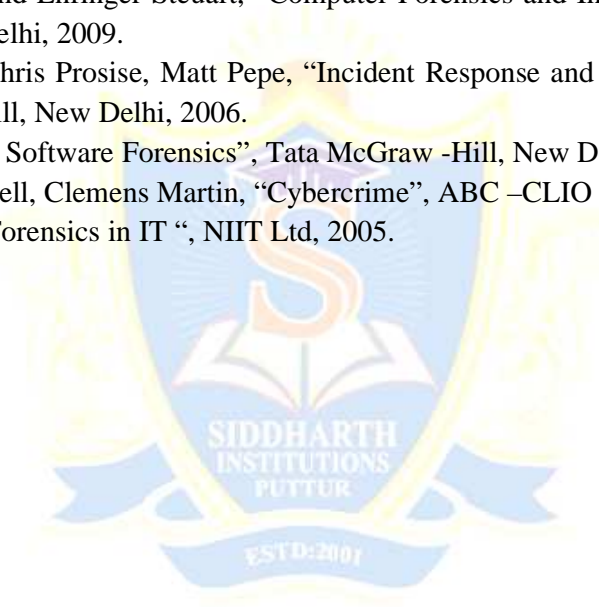
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
ELECTIVE-I
(16CS5806) ADVANCES IN DATABASES

M.Tech I Year -I Sem. (CSE)   **L   T   C**
                                                        4   -   4

Course Objectives:
- Introducing Distributed Database Management System and its Design issues
- Exploring several algorithms for processing queries and be able to use them
- Describe the methods to translate complex conceptual data models into logical and Physical database designs
- Demonstrating query optimization and its algorithms
- Enumerating the concepts behind distributed transaction processing

UNIT- I:
Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.
Overview of Relational DBMS: Relational Database Concepts, Normalization, Integrity rules, Relational data languages.

UNIT- II:
Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture. **Distributed Database Design**: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation

UNIT- III:
Query Processing and decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT- IV:
Distributed query Optimization: Query optimization, centralized query optimization, Distributed query optimization algorithms.

UNIT- V:
Transaction Management: Definition, properties of transaction, types of transactions.
Distributed concurrency control: Serializability, concurrency control Mechanisms & Algorithms, Time stamped & Optimistic concurrency control Algorithms, Deadlock Management.

Text Books:
1. M.Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems,Pearson Edn. Asia, 2001.
2. Stefano Ceri and Willipse Pelagatti: Distributed Databases, McGraw Hill.
3. Henry F Korth, A Silberchatz and Sudershan : Database System Concepts, MGH
4. Raghuramakrishnan and Johhanes Gehrke: Database Management Systems,MGH

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
ELECTIVE-I
(16CS5807) ADVANCED OPERATING SYSTEMS

M.Tech I Year -I Sem. (CSE)   **L   T   C**
                                                                  4   -   4

Course Objectives:

- To learn the fundamentals of Operating Systems
- To gain knowledge on Distributed operating system concepts that includes architecture, Mutual   exclusion   algorithms, Deadlock detection algorithms and agreement protocols
- To gain insight on to the distributed resource management components viz. the algorithms for implementation of distributed shared memory, recovery and commit protocols
- To know the components and management aspects of Real time, Mobile operating systems

UNIT- I:
FUNDAMENTALS   OF   OPERATING   SYSTEMS: Overview–Synchronization Mechanisms–Processes and Threads-Process Scheduling–Deadlocks: Detection, Prevention and Recovery–Models of Resources–Memory Management Techniques.

UNIT- II:
DISTRIBUTED OPERATING SYSTEMS: Issues in Distributed Operating System– Architecture –Communication Primitives– Lamport's Logical clocks –Causal Ordering of Messages–Distributed Mutual Exclusion Algorithms–Centralized and Distributed Deadlock Detection Algorithms–Agreement Protocols

UNIT- III:
 DISTRIBUTED RESOURCE MANAGEMENT: Distributed File Systems–Design Issues-Distributed Shared Memory–Algorithms for Implementing Distributed Shared memory–Issues in Load Distributing–Scheduling Algorithms–Synchronous and Asynchronous Check Pointing and Recovery–Fault Tolerance
–Two-Phase Commit Protocol–Nonblocking Commit Protocol–Security and Protection.

UNIT- IV:
REAL TIME AND MOBILE OPERATING SYSTEMS: Basic Model of Real Time Systems-Characteristics-Applications of Real Time Systems–Real Time Task Scheduling-Handling Resource Sharing-Mobile Operating Systems–Micro Kernel Design-Client Server Resource Access–Processes and Threads-Memory Management-File system.

UNIT- V:
CASE STUDIES: Linux System: Design Principles-Kernel Modules-Process Management Scheduling-Memory   Management-Input-Output   Management-File   System-Interprocess

Communication. iOS and Android: Architecture and SDK Framework-Media Layer-Services Layer-Core OS Layer-File System.

TEXT BOOKS:
1. Mukesh Singhal and Niranjan G. Shivaratri, "Advanced Concepts in Operating Systems–Distributed, Database, and Multiprocessor Operating Systems", Tata McGraw-Hill, 2001.
2. Abraham Silberschatz; Peter Baer Galvin; Greg Gagne, "Operating System Concepts", Seventh Edition, John Wiley & Sons, 2004

REFERENCES:
1. Daniel P Bovet and Marco Cesati, "Understanding the Linux kernel", 3rd edition, O'Reilly, 2005.
2. Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson Education India, 2006.
3. Neil Smyth, "iPhone iOS 4 Development Essentials–Xcode", Fourth Edition, Payload media, 2011.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
ELECTIVE-I
(16CS5808) COMPUTER VISION

M.Tech I Year -I Sem. (CSE)   L   T   C
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Course Objectives:
- The objective of this course is to understand the basic issues in computer vision and major approaches that address them
- Introduce the fundamental problems of computer vision.
- Provide understanding of techniques, mathematical concepts and algorithms used in computer vision to facilitate further study in this area.
- To develop the student's understanding of the issues involved in trying to define and simulate perception.
- To familiarize the student with specific, well known computer vision methods, algorithms and results
- To provide the student additional experience in the analysis and evaluation of complicated systems

UNIT- I:
Image Formation & Image Models: Cameras, Geometric Camera Models, Geometric Camera, Calibration, Radiometry, Sources, Shadows and Shading and Color.

UNIT- II:
Early Vision: Linear Filters, Edge Detection, Texture, The Geometry of Multiple Views, Stereopsis, Affine Structure Formation, And Projective Structure From Motion.

UNIT- III:
Mid-Level Vision: Segmentation By Clustering, Segmentation By Fitting a Model, Segmentation and Fitting using Probabilistic Methods, Tracking with Linear Dynamic Models.

UNIT- IV:
High-Level Vision: Model based Vision, Smooth Surfaces and other outlines, Aspect Graphs, Range Data.

UNIT- V:
High-level Vision, Probabilistic and Inference Methods: Finding Templates using Classifiers, Recognition by Relations Between Templates, Geometric Templates from Spatial Relations and Applications.

Text Book:
Forsyth and Ponce; "Computer Vision A Modern Approach", PHI.
Reference Books:
1. D.H.Ballard & C.M.Brown , "Computer Vision"
2. S. E Umbaugh; "Computer Vision and Image Processing: A Practical Approach Using CVIP tools" Prentice Hall PTR, Upper Saddle, NJ

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5809) SOFTWARE LAB- 1 (COVERING THE EXPERIMENTS: PYTHON TASKS, DATA STRUCTURE TASKS)

M.Tech I Year -I Sem. (CSE)   **L**   **P**   **C**
                                                         0   **4**   **2**

Course Objective:
- Learn to solve various problems through Python
- Learn to solve problems in Data structures

PART-A: PROGRAMMING IN PYTHON LAB

1. Create a new program called hello world.py. You will use this file to write your very first Hello, world! program.
2. Write a Python Program to find the roots of a Quadratic Equation.
3. Using a for loop, write a program that prints out the Fibonacci sequence.
4. Write a Python Program to generate n prime numbers
5. Write a Python Program to find factorial of a given number using Methods.
6. Create a Student class in Python, read and display the student details.
7. Write a HTML file to create a simple form with 5 input fields viz. Name, Password, Email, Pin code, Phone No. and a Submit button and validate the fields using Python.
8. Write a Python program to display error messages if the above validations do not hold.
9. Create a form for your college library entering student details for each student in the college. Validate the form using Python validators and display error messages.
10. Write a Python program to validate a user credentials like user-name and password using Database.
11. Create a Python program to demonstrate opening, reading and writing and closing a file.

PART-B: ADSA LAB

1. Write a C++ program that use both recursive and non-recursive functions for implementing the following searching methods:
   a) Linear search   b) Binary search
2. Write a C++ program to implement the following using an array.
   a) Stack ADT   b) Queue ADT
3. Write a C++ program to implement the following using a singly linked list.
   a) Stack ADT   b) Queue ADT
4. Write a C++ program to implement circular queue ADT using an array.
5. Write a C++ program to perform the following operations:
   a) Construct a binary search tree of elements.
   b) Search for a key element in the above binary search tree.
   c) Delete an element from the above binary search tree.
6. Write a C++ program that use recursive and non-recursive functions to traverse the given binary tree in
   a) Preorder   b) Inorder   c) Postorder
7. Write a C++ programs for the implementation of BFS and DFS for a given graph.
8. Write a C++ program for implementing the following sorting methods:
   a) Bubble sort   b) Merge sort   c) Heap sort   d) Quick sort

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5810) SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

M.Tech I Year -II Sem. (CSE)	L	P	C
	4	-	4

Course Objectives:

- To understand the concept of patterns and the Catalog.
- To discuss the Presentation tier design patterns and their affect on: sessions, client access, validation and consistency.
- To understand the variety of implemented bad practices related to the Business and Integration tiers.
- To highlight the evolution of patterns.
- To how to add functionality to designs while minimizing complexity
- To understand what design patterns really are, and are not
- To learn about specific design patterns.
- To learn how to use design patterns to keep code quality high without overdesign.

UNIT- I:
Envisioning Architecture, The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views. Creating an Architecture, Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT- II:
Analyzing Architectures: Architecture Evaluation, Architecture design decision making, ATAM, CBAM. Moving from one system to many Software Product Lines, Building systems from off the shelf components, Software architecture in future

UNIT- III:
Patterns , Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.
Creational and Structural patterns Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight.

UNIT- IV :
Behavioral patterns, Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

UNIT- V:
Case Studies :A-7E –A case study in utilizing architectural structures, The World Wide Web -a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech –a case study in product line development

TEXT BOOKS:
1. Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS:

1. Beyond Software architecture, Luke Hohmann, Addison wesley, 2003.
2. Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001
3. Software Design, David Budgen, second edition, Pearson education, 2003
4. Head First Design patterns, Eric Freeman & Elisabeth Freeman, O'REILLY, 2007.
5. Design Patterns in Java, Steven John Metsker & William C. Wake, Pearson education, 2006
6. J2EE Patterns, Deepak Alur, John Crupi & Dan Malks, Pearson education, 2003.
7. Design Patterns in C#, Steven John metsker, Pearson education, 2004.
8. Pattern Oriented Software Architecture, F.Buschmann & others, John Wiley & Sons.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5811) CLOUD COMPUTING

M.Tech I Year -II Sem. (CSE)   L   P   C
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Course Objectives:
- To learn the new computing model which enables shared resources on demand over the network.
- To learn about the pay-per-use scenarios.
- To learn about the new kind of service models and deployment models.
- To learn about the virtualization technology.
- To learn the python programming or various services and models.

UNIT- I:
Principles of Parallel and Distributed Computing, Introduction to cloud computing, Cloud computing Architecture, cloud concepts and technologies, cloud services and platforms, Cloud models, cloud as a service, cloud solutions, cloud offerings, introduction to Hadoop and Mapreduce

UNIT- II:
Cloud Platforms for Industry, Healthcare and education, Cloud Platforms in the Industry, cloud applications. Virtualization, cloud virtualization technology, deep dive: cloud virtualization,
Migrating in to cloud computing, Virtual Machines Provisioning and Virtual Machine Migration Services, On the Management of Virtual Machines for cloud Infrastructure, Comet cloud, T-Systems,

UNIT- III:
Cloud computing Applications: Industry, Health, Education, Scientific Applications, Business and Consumer Applications, Understanding Scientific Applications for Cloud Environments, Impact of Cloud computing on the role of corporate IT. Enterprise cloud computing Paradigm, Federated cloud computing Architecture, SLA Management in Cloud Computing, Developing the cloud: cloud application Design.

UNIT- IV:
Python Basics, Python for cloud, cloud application development in python, Cloud Application Development in Python. **Programming Google App Engine with Python**: A first real cloud Application, Managing Data in the cloud, Google app engine Services for Login Authentication, Optimizing UI and Logic, **Making the UI Pretty:** Templates and CSS, Getting Interactive. Map Reduce Programming Model and Implementations.

UNIT- V:
Cloud management, Organizational Readiness and change management in the cloud age, Cloud Security ,Data security in the cloud, Legal Issues in the Cloud , Achieving Production Readiness for the cloud Services

TEXT BOOKS:
   1. Cloud Computing: Raj Kumar Buyya , James Broberg, andrzej Goscinski, 2013 Wiley
   2. Mastering Cloud Computing: Raj Kumar buyya, Christian Vecchiola,selvi-2013.
   3. Cloud Computing: Arshdeep Bahga, Vijay Madisetti, 2014, University Press.
   4. Cloud computing: Dr Kumar Saurab Wiley India 2011.

REFERENCES:
   1. Code in the Cloud: Mark C.Chu-Carroll 2011, SPD.(Second part of IV UNIT)
   2. Essentials of cloud computing : K Chandrasekharan CRC Press.
   3. Cloud Computing: John W. Rittinghouse, James Ransome, CRC Press.
   4. Virtualization Security: Dave shackleford 2013. SYBEX a wiley Brand.
   5. Cloud computing and Software Services: Ahson , Ilyas.2011.
   6. Cloud Computing Bible: Sosinsky 2012. Wiley India .
   7. Cloud Computing: Dan C. Marinescu-2013, Morgan Kaufmann.
   8. Distributed and Cloud Computing, Kai Hwang, Geoffery C.Fox, Jack J.Dongarra, Elsevier, 2012.
   9. Fundamentals of Python Kenneth A.Lambert | B.L.Juneja
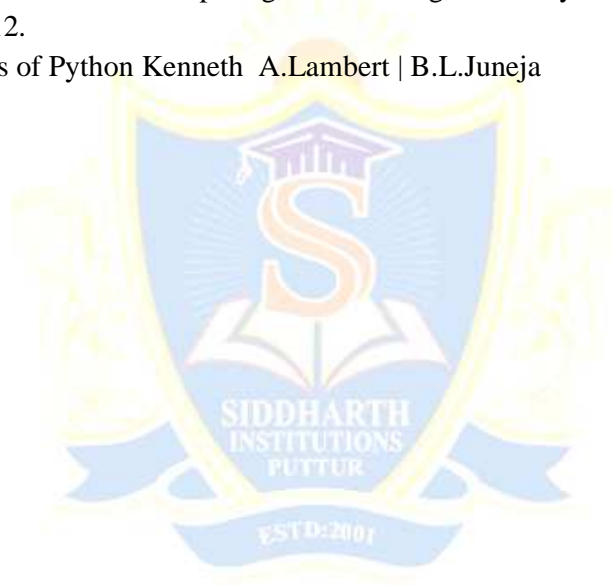
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5812) DATA ANALYTICS

M.Tech I Year -II Sem. (CSE)	**L**	**P**	**C**
	4	**-**	**4**

Course Objectives:
- To understand about big data
- To learn the analytics of Big Data
- To Understand the MapReduce fundamentals

Unit- I:
Big Data Analytics : What is big data, History of Data Management ; Structuring Big Data ; Elements of Big Data ; Big Data Analytics; Distributed and Parallel Computing for Big Data; Big Data Analytics:What is Big Data Analytics, What Big Data Analytics Isn't, Why this sudden Hype Around Big Data Analytics, Classification of Analytics, Greatest Challenges that Prevent Business from Capitalizing Big Data; Top Challenges Facing Big Data; Why Big Data Analytics Important; Data Science; Data Scientist; Terminologies used in Big Data Environments; Basically Available Soft State Eventual Consistency (BASE); Open source Analytics Tools;

Unit- II:
Understanding Analytics and Big Data: Comparing Reporting and Analysis, Types of Analytics; Points to Consider during Analysis; Developing an Analytic Team; Understanding Text Analytics;
Analytical Approach and Tools to Analyze Data: Analytical Approaches; History of Analytical Tools; Introducing Popular Analytical Tools; Comparing Various Analytical Tools.

Unit- III:
Understanding MapReduce Fundamentals and HBase : The MapReduce Framework; Techniques to Optimize MapReduce Jobs; Uses of MapReduce; Role of HBase in Big Data Processing; **Storing Data in Hadoop :** Introduction of HDFS, Architecture, HDFC Files, File system types, commands, org.apache.hadoop.io package, HDF, HDFS High Availability; Introducing HBase, Architecture, Storing Big Data with HBase , Interacting with the Hadoop Ecosystem; HBase in Operations-Programming with HBase; Installation, Combining HBase and HDFS;

Unit- IV:
Big Data Technology Landscape and Hadoop : NoSQL, Hadoop; RDBMS versus Hadoop; Distributed Computing Challenges; History of Hadoop; Hadoop Overview; Use Case of Hadoop; Hadoop Distributors; HDFC (Hadoop Distributed File System), HDFC Daemons, read,write, Replica Processing of Data with Hadoop; Managing Resources and Applications with Hadoop YARN.

Unit- V:

Social Media Analytics and Text Mining: Introducing Social Media; Key elements of Social Media; Text mining; Understanding Text Mining Process; Sentiment Analysis, Performing Social Media Analytics and Opinion Mining on Tweets;

Mobile Analytics: Introducing Mobile Analytics; Define Mobile Analytics; Mobile Analytics and Web Analytics; Types of Results from Mobile Analytics; Types of Applications for Mobile Analytics; Introducing Mobile Analytics Tools;

TEXT BOOKS

1. BIG DATA and ANALYTICS, Seema Acharya, Subhasinin Chellappan, Wiley publications.
2. BIG DATA, Black Book^{TM}, DreamTech Press, 2015 Edition.
3. BUSINESS ANALYTICS 5e , BY Albright |Winston

REFERENCE BOOKS:

1. Rajiv Sabherwal, Irma Becerra- Fernandez," Business Intelligence –Practice, Technologies and Management", John Wiley 2011.
2. Lariss T. Moss,ShakuAtre, " Business Intelligence Roadmap", Addison-Wesley It Service.
3. Yuli Vasiliev, " Oracle Business Intelligence : The Condensed Guide to Analysis and Reporting", SPD Shroff, 2012.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5813) JAVA & WEB TECHNOLOGIES

M.Tech I Year -II Sem. (CSE)	L	P	C
	4	-	4

Course Objectives:

- Cover issues related to the definition, creation and usage of HTML, DHTML, Java Script and CSS.
- Discuss the principles of inheritance and polymorphism and demonstrate though problem analysis assignments how they relate to the design of swings methods, abstract classes and interfaces.
- Provide the foundation of good programming skills by discussing keys issues to the design of Servlets and Servlet API
- Cover the basics of creating JSP Programs and its API in detail.

Unit- I:
HTML Common tags-List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script, CSS

Unit- II:
XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX, Review of Applets, Class, Event Handling, AWT Programming.
Introduction to Swing: JApplet, Handling Swing Controls like Icons–Labels –Buttons –Text Boxes –Combo Boxes – Tabbed Pains –Scroll Pains –Trees –Tables Differences between AWT Controls & Swing Controls Developing a Home page using Applet & Swing.

Unit- III:
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API.
Web servers: Tomcat Server installation & Testing.
Introduction to Servelets: Lifecycle of a Serverlet, JSDK The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters.

Unit- IV:
More on Servlets: The javax. servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.
Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC architecture. AJAX.

Unit- V:
JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing –Displaying Values Using an Expression to Set

an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages –Sharing Session and Application Data –Memory Usage Considerations, Database Access Database Programming using JDBC, Studying Javax.sql.* package Accessing a Database from a JSP Page Application –Specific Database Actions Deploying JAVA Beans in a JSP Page Learning

TEXT BOOKS:
1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT 1,2)
2. The complete Reference Java 2 Fifth Edition ,Patrick Naughton and Herbert Schildt., TMH (Chapters: 25) (UNIT 2,3)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 3,4,5)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta,Pearson
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES , Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web –How to program , Dietel and Nieto PHI/Pearson.
4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Professional Java Server Programming,S.Allamaraju and others Apress(dreamtech).
8. Java Server Programming, Ivan Bayross and others,The X Team,SPD
9. Web Warrior Guide to Web Programmming-Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.
12. Java Script,D.Flanagan,O'Reilly,SP

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5814) OBJECT ORIENTED ANALYSIS AND DESIGN

M.Tech I Year -II Sem. (CSE)   **L**   **P**   **C**
                                                            4   **-**   **4**

Course Objectives:
- To learn the terms and concepts of various UML diagrams
- To learn about unified Process
- To learn how the unified process is use case driven, architecture centric, and iterative and incremental
- To learn about Software development life cycle phases

UNIT- I:
Introduction to UML: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, generosity, importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.
Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object diagrams.

UNIT- II:
Collaboration Diagrams: Terms, Concepts, depicting a message, polymorphism in collaboration diagrams, iterated messages, use of self in messages.
Sequence Diagrams: Terms, concepts, depicting asynchronous messages with/without priority, callback mechanism, broadcast messages.
Basic Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams.
Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.
Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT- III:
The Unified process: use case driven, architecture centric, iterative, and incremental.
The Four Ps: people, project, product, and process
Use case driven process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases
Architecture-centric process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.

UNIT- IV:
Iterative incremental process: iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.
The Generic Iteration workflow: phases are the first division workflow, planning proceeds doing, risks affect project planning, use case prioritization, resource needed, assess the iteration and phases.

UNIT- V:
Inception phase: early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.
Elaboration Phase: elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core workflows-Requirements to test.
Construction phase: early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.
Transition phase: early in the transition phase, activities in transition phase.
Case Studies: Automation of a Library, Software Simulator application (2-floor elevator simulator).

TEXT BOOKS :
1. The Unified Modeling Language User Guide By Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.
2. UML 2 Toolkit By Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado WILEY-Dreamtech India Pvt. Ltd.
3. The Unified Software Development Process By Ivar Jacobson, Grady Booch, James Rumbaugh, Pearson Education

REFERENCES:
1. Fundamentals of Object Oriented Design in UML By Meilir Page-Jones, Pearson Education
2. Object Oriented Analysis & Design By Atul Kahate, The McGraw-Hill.
3. Practical Object-Oriented Design with UML By Mark Priestley, TATA McGrawHill
4. Object Oriented Analysis & Design By Brett D McLaughlin, Gary Pollice and David West, O"REILY .
5. Object-Oriented Analysis and Design using UML By Simon Bennet, Steve McRobb and Ray Farmer, 2nd Edition, TATA McGraw Hill.
6. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, THOMSON Course Technology.
7. UML and C++, R.C.Lee, and W.M.Tepfenhart,PHI.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
ELECTIVE-II
(16CS5815) MACHINE LEARNING

M.Tech I Year -II Sem. (CSE)	L	P	C
	4	-	4

Course Objectives:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.
- To be able to read current research papers and understands the issues raised by current research.

UNIT- I:
INTRODUCTION -Well-posed learning problems, Designing a learning system, Perspectives and issues in machine learning Concept learning and the general to specific ordering –Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias

UNIT- II:
Decision Tree learning –Introduction, Decision tree representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning Artificial Neural Networks –Introduction, Neural network representation, Appropriate problems for neural network learning, Perceptions, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition Advanced topics in artificial neural networks Evaluation Hypotheses – Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms

UNIT- III:
Bayesian learning –Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, An example learning to classify text, Bayesian belief networks The EM algorithm Computational learning theory– Introduction, Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis

Space, Sample Complexity for infinite Hypothesis Spaces, The mistake bound model of learning -Instance-Based Learning-Introduction, k -Nearest Neighbour Learning, Locally Weighted Regression, Radial Basis Functions, Case –Based Reasoning, Remarks on Lazy and Eager Learning Genetic Algorithms– Motivation, Genetic Algorithms, An illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

UNIT- IV:
Learning Sets of Rules–Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution Analytical Learning-Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

UNIT- V:
Combining Inductive and Analytical Learning–Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to Alter the Search Objective,
Using Prior Knowledge to Augment Search Operators, Reinforcement Learning–Introduction, The Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

TEXT BOOKS:
1. Machine Learning –Tom M. Mitchell, -MGH
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC)

REFERENCE BOOKS:
1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William WHsieh, Cambridge Univ Press.
2. Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc., 2001
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
ELECTIVE-II
(16CS5816) DISTRIBUTED SYSTEMS

M.Tech I Year -II Sem. (CSE)   L   P   C
                                                                   4   -   4

Course Objectives:
- To explain what a distributed system is, why you would design a system as a distributed system, and what the desired properties of such systems are;
- To list the principles underlying the functioning of distributed systems, describe the problems and challenges associated with these principles, and evaluate the effectiveness and shortcomings of their solutions;
- To recognize how the principles are applied in contemporary distributed systems, explain how they affect the software design, and be able to identify features and design decisions that may cause problems;
- To design a distributed system that fulfills requirements with regards to key distributed systems properties (such as scalability, transparency, etc.), be able to recognize when this is not possible, and explain why;
- To build distributed system software using basic OS mechanisms as well as higher-level middleware and languages.

UNIT- I:
Characterization of Distributed Systems-Introduction-Examples - Resource Sharing and the Web - Challenges. System Models - Architectural - Fundamental. Interprocess Communication - Introduction - API for Internet protocols - External data representation and marshaling - Client -server communication - Group communication - Case study: Interprocess Communication in UNIX.

UNIT- II:
Distributed Objects and Remote Invocation - Introduction - Communication between distributed objects - Remote procedure calls - Events and notifications - Case study: Java RMI. Operating System Support - Introduction - OS layer - Protection - Processes and threads - Communication and invocation OS architecture.

UNIT- III:
Distributed File Systems - Introduction - File service architecture - Case Study: Sun Network File System - Enhancements and further developments. Name Services - Introduction - Name Services and the Domain Name System - Directory Services - **Case Study**: Global Name Service.

UNIT- IV:
Time and Global States - Introduction - Clocks, events and process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Distributed debugging.

Coordination and Agreement - Introduction - Distributed mutual exclusion - Elections - Multicast communication - Consensus and related problems

UNIT- V:
Distributed Shared Memory - Introduction - Design and implementation issues - Sequential consistency and Ivy case study Release consistency and Munin case study - Other consistency models. CORBA Case Study - Introduction - CORBA RMI - CORBA services.

TEXT BOOKS:
1. George Coulouris, Jean Dollimore, Tim Kindberg, , "Distributed Systems: Concepts and Design", 4th Edition, Pearson Education.
2. Distributed Systems, S.Ghosh, Chapman & Hall/CRC, Taylor & Francis Group, 2010.

REFERENCES:
1. A.S. Tanenbaum and M. V. Steen, "Distributed Systems: Principles and Paradigms",Second Edition,   Prentice Hall, 2006.
2. M.L.Liu, "Distributed Computing Principles and Applications", Pearson Addison Wesley, 2004.
3. Mukesh Singhal, "Advanced Concepts In Operating Systems", McGrawHill Series in Computer Science, 1994.
4. Nancy A. Lynch, "Distributed Algorithms", The Morgan Kaufmann Series in Data Management System, Morgan Kaufmann Publishers, 2000.
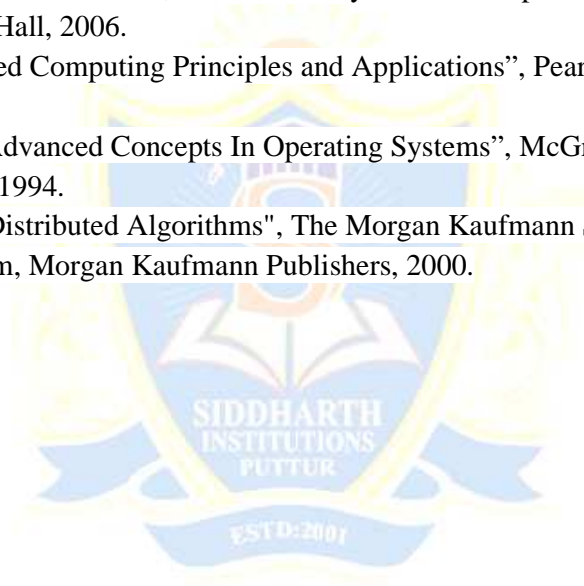
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
ELECTIVE-II
(16CS5817) IMAGE PROCESSING AND PATTERN RECOGNITION

M.Tech I Year -II Sem. (CSE)

	L	P	C
	4	-	4

Course Objectives:
- To study the Image fundamentals.
- To study the mathematical morphology necessary for Image processing and Image segmentation.
- To study the Image Representation and description and feature extraction.
- To study the principles of Pattern Recognition.
- To know the various applications of Image processing.

UNIT- I:
INTRODUCTION: Elements of an Image Processing System-Mathematical Preliminaries-Image Enhancement-Grayscale Transformation-Piecewise Linear Transformation-Bit Plane Slicing-Histogram Equalization--Histogram Specification-Enhancement by Arithmetic Operations-Smoothing Filter-Sharpening Filter-Image Blur Types and Quality Measures.

UNIT- II:
MATHEMATICAL MORPHOLOGY and IMAGE SEGMENTATION: Binary Morphology-Opening and Closing-Hit-or-Miss Transform-Grayscale Morphology-Basic morphological Algorithms-Morphological Filters-Thresholding-Object (Component) Labeling-Locating Object Contours by the Snake Model-Edge Operators-Edge Linking by Adaptive Mathematical morphology-Automatic Seeded Region Growing-A Top-Down Region Dividing Approach.

UNIT- III:
IMAGE REPRESENTATION AND DESCRIPTION and FEATURE EXTRACTION, Run-Length Coding-Binary Tree and Quadtree-Contour Representation-Skeletonization by Thinning-Medial Axis Transformation-Object Representation and Tolerance-Fourier Descriptor and Moment Invariants-Shape Number and Hierarchical Features-Corner Detection - Hough Transform-Principal Component Analysis-Linear Discriminate Analysis -Feature Reduction in Input and Feature Spaces.

UNIT- IV:
PATTERN RECOGNITION: The Unsupervised Clustering Algorithm-Bayes Classifier - Support Vector Machine-Neural Networks-The Adaptive Resonance Theory Network-Fuzzy Sets in Image Analysis-Document image processing and classification-Block Segmentation and Classification-Rule-Based Character Recognition system-Logo Identification-Fuzzy Typographical Analysis for Character Pre classification-Fuzzy Model for Character Classification.

UNIT- V:

APPLICATIONS: Face and Facial Feature Extraction-Extraction of Head and Face Boundaries and Facial Features - Recognizing Facial Action Units-Facial Expression Recognition in JAFFE Database-Image Steganography-Types of Steganography-Applications of Steganography-Embedding Security and Imperceptibility-Examples of Steganography Software-Genetic Algorithm Based Steganography.

TEXT BOOKS:

1. Image Processing and Pattern Recognition: Fundamentals and Techniques-Frank Y Shih, Willey IEEE Press, April 2010.
2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, "Digital Image Processing using MATLAB", Pearson Education, Inc., 2004.

REFERENCES:

1. D.E. Dudgeon and R.M. Mersereau, "Multidimensional Digital Signal Processing", Prentice Hall Professional Technical Reference, 1990.
2. William K. Pratt, " Digital Image Processing", John Wiley, New York, 2002.
3. Milan Sonka et al, "Image Processing, Analysis and Machine Vision", Brookes/Cole, Vikas Publishing House, 2nd edition, 1999;
4. Sid Ahmed, M.A., " Image Processing Theory, Algorithms and Architectures", McGraw Hill, 1995
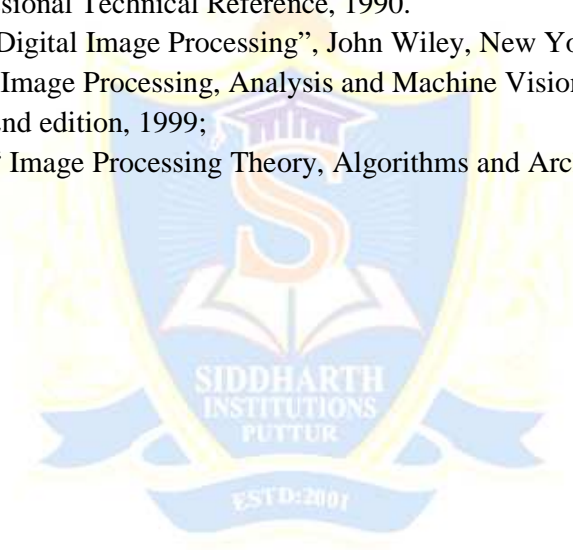
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16CS5818) SOFTWARE LAB- 2 (COVERING THE EXPERIMENTS: JWT TASKS
& UML TASKS)

M.Tech I Year -II Sem. (CSE)	**L**	**P**	**C**
	0	**4**	**2**

Course Objectives:
- To learn problems to solve using various web technologies.
- To learn problems to be drawn using various UML Digrams

PART-A: JWT LAB

Task-1: Develop Web page in which frames are created such as topframe having image as logo at left, Online book store as title at center, then have links such as home, login, registration, catalogue, and cart, Second Frame have links of department book details of CSE, ECE, EEE, ME, and Civil, Right frame is designed which should display details of any link that pressed but initially contain some text. The following are screen shots that should be created.

Task-2: Implement Two pages of Task1 named cart(which displays books details along with total billing) and registration pages(which asks for user details like name, date of birth, gender, address etc).

Task-3: Write a Java Script that validate few things in registration page such as name that must contain at least 6 characters length, password must contain at least 6 characters length, E-mail id that must contain a name followed by @domainservername.com, and phone number that contain at least 10 digits.

Task-4: Perform the following tasks using CSS(Cascading Style sheets).
1) Use Different font styles. Define styles in head tag, use them in body tag to get output.
2) Set background image for both page and single elements on the page.
3) Control background of the image using background repeat only.
4) Define styles for the following links as A:link A:visisted A:active A:hover .
5) Work with the page as layers.
6) Deal all Cursor properties.

Task-5: Develop DTD which ensure validdness of the XML file. Develop XSL code to display XML content into a table on a Page.

Week-6 : Developing coloring the shapes rectangle and circle using java code and execute it in BDK bean Box.

Task-7: Installation of Apache, run week-1 and week-2 in Apache.

Task-8: Develop a web application that compares user and password values taken from the HTML page with four sets of cookies. If they match, welcome to specific user should be displayed. Otherwise, welcome to guest is displayed.

Task-9: Develop application in which some user details such as name, password, phone number, and mail id should be inserted. Then, retrieve and display those details in the page.

Task-10: Develop a web application in which user has to register first, 3 or 4 user details should be inserted. Then, it asks for user login, then displays user displays after successful login.

Task-11: Develop a book web application that contain book details such as title, price, quantity, and amount charged for the purchase.

Task-12 : Develop cart page that consist of some books details which also allows user to select some items in the available list of cart page. The selected items are shown in catalogue page using sessions.

TEXT BOOKS:
1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech
2. The complete Reference Java 2 Fifth Edition ,Patrick Naughton and Herbert Schildt., TMH (Chapters: 25)
3. Java Server Pages –Hans Bergsten, SPD O‟Reilly

PART-B: OOAD LAB

List of Experiments:
1) **Airline Reservation System:** This scenario includes first the customer approach the booking staff in the counter, asks for availability of seat, fill the form after confirmation of seat, submit filled form, customer details are updated in the site, collect fare and issue ticket.
2) **Crime Management System:** This describes about how police tackle the crime situation. This involves actions such as victim complaint about loss, police start enquiry which begins from enquiry the people near the crime place, identify the clue in the collected data, find the thief, and recover the property.
3) **Restaurant Management System:** This describes how customer is serviced in the restaurant. This involves customer asks the menu of items, choose an item to eat, order that item to waiter, waiter intimate the same order to chef, chef prepare the food, waiter collects and serve to the customer, waiter takes bill from cashier by intimating the number of items were ordered by the customer, collect money from customer by giving the bill.
4) **TTD E-Seva System:** This involves customer visit booking staff in the counter, asks about darshan details, fill the form after checking availability, update customer details, collect money by issuing the ticket, and leave the counter.
5) **Online Voting Verification System:** This involves customer opens the site, checks whether the valid voter or not using controls in the site, if not a valid voter, click new registration control, enter voter details , click submit, the database checks voter AAdar id which validate that user is valid or not, if voter enters invalid aardar id No asks again to enter correct Aadaar no., voter gets voter id to their mobile after that transaction is successful, and finally, user closes site after verification.

6) Library Management System: This involves customer enter into library, pick concerned book, ask the librarian to give that book, librarian checks in the database, allows to issue the book if user have one or more member cards, collect member card from user, arrange in the basket, issue that book, librarian impose fine on members who didn't submit books in time or damage of the book or loss of the book, and user leave the library.

TEXT BOOKS:
1. The Unified Modeling Language User Guide By Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.
2. UML 2 Toolkit By Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado WILEY-Dreamtech India Pvt. Ltd.
3. The Unified Software Development Process By Ivar Jacobson, Grady Booch, James Rumbaugh, Pearson Education

REFERENCES:
1. Fundamentals of Object Oriented Design in UML By Meilir Page-Jones, Pearson Education
2. Object Oriented Analysis & Design By AtulKahate, The McGraw-Hill.
3. Practical Object-Oriented Design with UML By Mark Priestley, TATA McGrawHill
4. Object Oriented Analysis & Design By Brett D McLaughlin, Gary Pollice and David West, O"REILY .
5. Object-Oriented Analysis and Design using UML By Simon Bennet, Steve McRobb and Ray Farmer, 2nd Edition, TATA McGrawHill.
6. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, THOMSON Course Technology.
7. UML and C++,R.C.Lee, and W.M.Tepfenhart, PHI.