B.TECH – COMPUTER SCIENCE & ENGINEERING
Course Structure R-20

Semester-V

S.No.	Class	Course Code	Name of the Subject	L	T	P	C
1	PC	C55PC1	Object Oriented Analysis and Design	3	0	0	3
2	PC	C55PC2	Python Programming	3	0	0	3
3	PC	C55PC3	Computer Networks	3	0	0	3
4	PC	C55PC4	Compiler Design	3	0	0	3
5	PE	C55PE5	A. Distributed Databases B. Distributed Computing C. Network Protocols D. Information Theory & Coding E. Software Process and Project Management F. Artificial Intelligence	3	0	0	3
6	OE	C55OE6	Open Elective I	3	0	0	3
7	PC	C55PC7	Object Oriented Analysis and Design Lab	0	0	2	1
8	PC	C55PC8	Python Programming Lab	0	0	2	1
9	PW	C55PW9	Project I	0	0	2	1
10	MC	MC005	MOOCs/Online Course	0	0	0	**S**
TOTAL							**21**

Project I: Student should develop back end database tables for any chosen database application. It can be extension of project work carried out in VI semester with back end connections. The table developed should be more than a six-table database. Students can form a minimum of two and maximum of 4 in a group. The allocated teachers should guide in framing the problem, teach the back end technologies like Oracle during the lab hours allotted to them. The departmental academic committee based on the rubrics framed will do the evaluation of the project.

Mandatory Course:**MOOCs/Online Course**
The student should register for any one of the MOOCs course offered by NPTEL, COURSERA, UDEMY, student should submit the completion certificate to clear this course.

B.TECH – COMPUTER SCIENCE & ENGINEERING
Course Structure R-20

Semester-VI

S.No	Class	Course Code	Name of the Subject	L	T	P	C
1	HS	CHSM2	Fundamentals of Management	3	0	0	3
2	PC	C56PC1	Data Warehousing and Data Mining	3	0	0	3
3	PC	C56PC2	Web Technologies	3	0	0	3
4	PE	C56PE3	A. Advanced Databases B. Mobile Computing C. Wireless Networks D. Cryptography E. Software Requirements Estimation F. Machine Learning	3	0	0	3
5	PE	C56PE4	A. Introduction to Analytics B. Cloud Computing C. Mobile Ad hoc Networks D. Network Security E. Design Patterns F. Deep Learning	3	0	0	3
6	HS	CHSE3	Advance Communication Skills Lab	0	0	4	2
7	PC	C56PC5	Data Warehousing and Data Mining Lab	0	0	2	1
8	PC	C56PC6	Web Technologies Lab	0	0	2	1
9	PW	C56PW7	Project –II	0	0	4	2
10	MC	MC006	1. Personality Development/Skill Development 2. Technical Events 3. Internships	0	0	0	**S**
TOTAL							**21**

Project –II: This project is extension of project work carried out in V semester with backend connections. Front end should be developed with .NET or Python or Java framework. The departmental academic committee based on the rubrics framed will do the evaluation of the project.

Mandatory Course : The satisfactory report should be submitted either for 1 or 2 or 3 given below.**1.Personality Development/Skill Development**: Student should participate in personality development/communication skills programme, student should submit the completion certificate for clearing this course.**2. Technical Events:** The student should participate in any technical event organized by any College/Organization/Industry and submit the participation certificate for clearing this course.**3. Internships:** The Student should submit the completion certificate from the respective organization. Where he/she performs their internship.

COMPUTER SCIENCE & ENGINEERING

B.Tech.V Semester **L/T/P/C**
3/0/0/3

OBJECT ORIENTED ANALYSIS AND DESIGN -C55PC1

Course Objective:

A student is able to take up the case studies and model in it. Different views with respect user requirements such as use case, logical, component and deployment and preparation of document of the project for the unified Library application.

Course Outcomes:

Upon completion of the Course, the student will be able to

1. Understand the significance of unified modelling language by studying the necessity of unified modelling language-L2
2. Construct basic structural modelling, using class and object diagrams-L3
3. Develop uses cases, and activities for applications –L5
4. Design state chart diagram, based on state machines, use components to deploy and build architectural models –L5
5. Implement unified library applications, develop patterns and framework –L3

UNIT I

Introduction to UML: Importance of modeling, principles of modeling, object-oriented modeling, the conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT II

Basic Structural Modeling:

Classes, Relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages. Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.
Basic Behavioral Modeling – II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagram Architectural Modeling: Component, Deployment, Component diagrams, and Deployment diagrams.

UNIT V

Patterns and Frameworks, Activity Diagrams. Case Study: The Unified library application.

Text Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education 2ndEdition

Reference Books:

1. Meilir Page-Jones: Fundamentals of Object-Oriented Design in UML Pearson Education.
2. Pascal Rogues: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt.Ltd.
3. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dream tech India Pvt.Ltd.

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C**
3/0/0/3

PYTHON PROGRAMMING - C55PC2

Course Objective:

To understand and learn the concepts of basic python programming, as it is a current programming constructs used for real time applications.

Course Outcomes:

After completion of course the student will be able to

1. Understand the basic concepts of python programming-L2
2. Illustrate operators, conditional statements, loops in python –L3
3. Construct code and test small python programs using functions and data structures –L3
4. Develop different programs using file concept modules of python – L5
5. Apply the concepts of object – oriented programming in python- L3

UNIT I

INTRODUCTION

Introduction to Python, History, Need of Python Programming, features Applications, python environment setup, Basic syntax, Variables, Data Types, Keywords, Input-Output, Indentation, script structure, Running Python Scripts.

UNIT II

OPERATORS

Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations, Conditional statements if, if-else Looping Control Structures for, while Control Statements: Break, Continue, Pass.

UNIT III

FUNCTIONS

Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

DATA STRUCTURES

Lists, Tuples, dictionaries, sets, Sequences, Comprehensions.

UNIT IV

FILES

File input/output, Text processing file functions.

MODULES

Creating modules, import statement, from. Name spacing, Packages, using packages, implementing packages: numpy, pandas, Django framework, iterator tools, scipy, matplot lib.

UNIT V

Object Oriented Programming in Python

Classes, 'self-variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding.

Error and Exception Handling

Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions.

Text Books:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
2. Wesley J. Chun –Core Python Programming‖, Second Edition, Prentice Hall.

Reference Books:

1. Allen Downey, –Think Python‖, Second Edition , Green Tea Press.
2. Introduction to Computation & Programming Using Python, Spring 203 Edition, By John V.Guttag.
3. Programming in Python 3: A Complete Introduction to the Python Language (Developer's Library), by Mark Summerfield, 2ndEdition.

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C 3/0/0/3**

COMPUTER NETWORKS (C55PC3)

Course Objective:

Identify the components required to build different types of networks and choose the required functionality at each layer for a given application

Course Outcomes:

Upon completion of the course the student will be able to

1. Understand the protocol layering and physical level communication –L2
2. Analyze Data link layer and MAC layer –L4
3. Compare and contrast between the functions of the network layer and the various routing protocols –L4
4. Demonstrate the functions and protocols of the Transport layer –L3
5. Illustrate the functions and protocols of the Application layer-L3

UNIT I

Introduction: OSI, TCP/IP, and other network models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies WAN, LAN, MAN.

Physical Layer: Transmission media copper, twisted pair wireless, switching and encoding asynchronous communications; Narrowband, broadband ISDN and ATM.

UNIT II

Data link layer: Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Slip, Data link layer in HDLC, Internet, ATM.

Medium Access sub layer: ALOHA, MAC addresses, Carrier sense multiple access. IEEE 80.X Standard Ethernet, wireless LANs. Bridges.

UNIT III

Network Layer: Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing. Dynamic routing – Broadcast routing. Rotary for mobility, The Network layer on the internet and in the ATM Networks.

UNIT IV

Transport Layer: Transport Services, Connection management, TCP and UDP protocols; Congestion Control Algorithms – General Principles – of Congestion prevention policies ATM AAL Layer Protocol.

UNIT V

Application Layer – Domain name system, SNMP, Electronic Mail (SMTP, POP3, IMAP, MIME) the World WEB, HTTP.

Text Books:

1.Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI.

Reference Books:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson.
3. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C**
3/0/0/3

COMPILER DESIGN (C55PC4)

Course Objectives:

Learn the process of designing and developing a compiler for a target machine.

Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand different phases of a compiler – L2
2. Design different parsers – L4
3. Demonstrate syntax-directed translation schemes and generate intermediate code- L3
4. Analyze code optimization techniques, and runtime environment – L4
5. Design machine independent code optimization techniques – L5

UNIT I

Introduction, Language Processors, the structure of a compiler, programming language basics. Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens, The Lexical- Analyzer Generator Lex, Finite Automata, From Regular Expressions to Automata, Design of a Lexical-Analyzer Generator, Optimization of DFA-Based Pattern Matchers.

UNIT II

Syntax Analysis: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom-Up Parsing, Introduction to LR Parsing: Simple LR, /More Powerful LR Parsers, Using Ambiguous Grammars, Parser Generators.

UNIT III

Syntax – Directed Translation: Syntax – Directed Definitions, Evaluation Orders for SDD‘s, Applications of Syntax-Directed Translation, Syntax-Directed Translation Schemes, and Implementing L – Attributed SDD‘s. Intermediate-Code Generation: Variants of Syntax Trees, Three – Address Code, Types and Declarations, Type Checking, Control Flow, Back patching, Switch – Statements, Intermediate Code for Procedures.

UNIT IV

Run-Time Environments: Storage organization, Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management, Introduction to Garbage Collection, Introduction to Trace – BasedCollection.

Code Generation: Issues in the Design of a Code Generator, The Target Language, Addresses in the Target Code, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, A Simple Code Generator, Peephole Optimization, Register Allocation and Assignment, Dynamic Programming Code-Generation.

UNIT V

Machine-Independent Optimizations: The Principle Sources of Optimization, Introduction to Data – Flow Analysis, Foundations of Data-Flow Analysis, Constant Propagation, Partial Redundancy Elimination, Loops in Flow Graphs.

Text Books:

1. Compilers: Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman, Pearson.

Reference Books:

1. Compiler Construction-Principles and Practice, Kenneth C Louden, Cengage Learning.
2. Modern compiler implementation in C, Andrew W Appel, Revised edition, Cambridge University Press.
3. The Theory and Practice of Compiler writing, J. P. Tremblay and P. G. Sorenson, TMH Writing compilers and interpreters, R. Mak, 3rd edition, Wiley student edition. Lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly.

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C 3/0/0/3**

DISTRIBUTED DATABASES (C55PE5A)

Course Objective:

Apply methods and techniques for distributed query processing and optimization and understand the broad concepts of distributed transaction process.

Course Outcomes:

Upon completion of the Course, the student will be able to

1. Identify the necessity of distributed Database concepts, through architecture and design- L1
2. Understand processing queries, decompose, and to optimize queries –L2
3. Practice the control mechanisms and algorithms that are implied through transaction management –L4
4. Discover i s s u e s like reliability, parallelism, associated in developing distributed database system – L4
5. Understand and relate the concepts of Object Oriented design paradigm to Distributed Databases –L2

UNIT I

Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.

Distributed DBMS Architecture:

Architectural Models for Distributed DBMS, DDMBS Architecture.

Distributed Database Design:

Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

UNIT II

Query processing and decomposition:

Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data.

Distributed query Optimization:

Query optimization, centralized query optimization, distributed query optimization algorithms.

UNIT III

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.

UNIT IV

Distributed DBMS Reliability:

Reliability concepts and measures, fault-tolerance in distributed systems, failures in Distributed DBMS, local & distributed reliability protocols, site failures and network partitioning.

Parallel Database Systems:

Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

UNIT V

Distributed Object Database Management Systems:

Fundamental object concepts and models, object distributed design, architectural issues, object management, distributed object storage, object query Processing.

Object Oriented Data Model:

Inheritance, object identity, persistent programming languages, persistence of objects, comparison OODBMS and ORDBMS

Text Books:

1. M. Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edition. Asia, 20.
2. Stefano Ceri and Giuseppe Pelagatti: Distributed Databases, McGraw Hill.

Reference Book:

1. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom: –Database Systems: The Complete Book‖, Second Edition, Pearson International Edition

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C**
3/0/0/3

DISTRIBUTED COMPUTING (C55PE5B)

Course Objective:

Introduce the fundamental problems, concepts, and approaches in the design and analysis of distributed computing systems and applications.

Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand knowledge on distributed system and computing paradigms –L2
2. Apply the inter process communication concepts to develop socket APIs-L3
3. Develop client server paradigms and imply to build group communication- L5
4. Illustrate the phenomenon of distributed objects, internet applications-L3
5. Understand the basics of grid computing –L2

UNIT I

Distributed Computing an Introduction:

The different forms of computing, The strengths and weaknesses of Distributed computing, Basics of Operating Systems, Network basics, Software Engineering Basics.

Distributed Computing Paradigms:

Paradigms and Abstractions, Paradigms for Distributed Applications. Trade-offs

UNIT II

Inter Process Communication:

Event Synchronization, Timeouts and Threading, Text based Protocols, Request-Response Protocols, Connection-Oriented versus Connection less IPC

The Socket API:

The Socket Metaphor on IPC, The datagram Socket API, The Stream-Mode Socket API, Sockets with Nonblocking I/O Operations, Secure Socket API.

UNIT III

The Client-Server Paradigm:

Client-Server Paradigm Issues, Connection-Oriented and Connectionless Servers, Iterative Server and Concurrent Server, Stateful Servers.

Group Communication:

Unicasting versus Multicasting, An Archetypal Multicast API, Connectionless versus Connection-Oriented Multicast, Reliable Multicasting versus Unreliable Multicasting, The Java Basic Multicast API

UNIT IV

Distributed Objects:

Message Passing versus Distributed Objects, An Archetypal Distributed Object Architecture, Distributed Object Systems, Remote Procedure Calls, Remote Method Invocation.

Internet Applications:

Applets, Servlets, Web Services , The Simple Object Access Protocol(SOAP)

UNIT V

The Grid: past, present, future:

The Grid, Beginnings of the Grid, A community Grid model, Building blocks of the Grid, Grid applications and application middleware

The Grid: A new infrastructure for 21st century science:

Technologytrends, Infrastructure and tools, Grid architecture, Authentication, authorization, and policy.

The evolution of the Grid:

The evolution of the Grid: the first generation, The evolution of the Grid: the second generation, The evolution of the Grid: the third generation

Text Books:

1. Distributed Computing, Principles and Applications, M.L.Liu, Pearson Education, 2004
2. Grid Computing Making the Global Infrastructure a Reality, Fran Berman, Anthony J.G. Hey, Geoffrey C. Fox, Wiley Series

Reference Books:

1. Grid Computing – Making the global infrastructure a reality, Fran Berman, Geoffrey C
2. Fox, Anthony J G Hey, Wiley India, 2010.
3. A Networking Approach to Grid Computing, D.Minoli, Wiley & sons, 2006.
4. Grid Computing: A Practical Guide to Technology and Applications, A.Abbas, Firewall Media, 2008.

COMPUTER SCIENCE & ENGINEERING

B.Tech.V Semester **L/T/P/C**
3/0/0/3

NETWORK PROTOCOLS (C55PE5C)

Course Objective:

Understand different network protocols, their architectures, various network security issues and WAN, LAN protocols.

Course Outcomes:

Upon completion of the course, the students will be able to:

1. Compare & contrast the different network architectures and protocols- L4
2. Design different TCP/IP protocols-L5
3. Understand various network security technologies and protocols- L2
4. Understand WAN protocols-L2
5. Analyze various LAN protocols-L4

UNIT I

Tcp/Ip Protocols: BOOTP, DHCP, DNS, Finger, FTP, HTTP, S-HTTP, IMAP and IMAP4, MIME (S-MIME), NAT, NNTP, POP and POP3, rlogin, RMON, SLP, SMTP, SNMP, SNMPv1, SNMPv2, SNMPv3, SNTP, TELNET, URL,

UNIT II

Whois (and RWhois), XMPP, X Window/X Protocol, RPC, ITOT, RDP, RUDP, TCP, UDP, BGP (BGP4), EGP, ICMP and ICMPv6, IP, IPv6, IRDP, Mobile IP, NARP, NHRP, OSPF, RIP, RIPng, RSVP, BGMP, DVMRP, IGMP, MARS, MBGP, MOSPF, MSDP, ARP and InARP, IPCP and IPv6CP, RARP.

UNIT III

Network Security Technologies and Protocols Kerberos: Network Authentication Protocol – RADIUS: Remote Authentication Dial In User Service – SSH: Secure Shell Protocol – L2F: Layer 2 Forwarding Protocol – L2TP: Layer 2 Tunneling Protocol – PPTP: Point-to-Point Tunneling Protocol – DiffServ: Differentiated Service Architecture – GRE: Generic Routing

UNIT IV

WAN Protocols: ATM: Asynchronous Transfer Mode Reference Model and Protocols - SONET/SDH: Synchronous Optical Network and Synchronous Digital Hierarchy – EoS: Ethernet over SONET/SDH – BISDN: Broadband Integrated Services Digital Network (Broadband ISDN) - ISDN: Integrated Services Digital Network – PPP: Point-to-Point Protocols – FTP: File Transfer Protocol – PAP: Password Authentication Protocol – PoS: Packet over SONET/SDH – Frame Relay: WAN Protocol for Internetworking – LAPF: Link Access Procedure for Frame Mode Services – HDLC: High Level Data Link Control.

UNIT V

LAN Protocols: Ethernet: IEEE 80.3 Local Area Network protocols – Fast Ethernet: 10Mbps Ethernet (IEEE 80.3u)- Gigabit (100 Mbps) Ethernet:IEEE 80.3z (100Base-X) and 80.3ab (100Base-T)- 10-Gigabit Ethernet: IEEE 80.3ae and 80.3an – WLAN: Wireless LAN by IEEE 80.11 protocols – IEEE 80.11i: WLAN Security Standard – IEEE 80.1X: EAP over LAN(EAPOL) for LAN/WLAN Authentication and Key Management – WPAN: Wireless Personal Area Network Communication Protocols – IEEE 80.15.1 and the Bluetooth for WPAN Communications.

Text Books:

1.Jielin Dong, Network Protocols Handbook, 4th Edition, Javvin Press, 207.

References Books:

1. Bruce Hartpence, Packet Guide to Core Network Protocols, OReilly Media, Inc., 201.
2. Walter Y. Chen, Home Network Basis: Transmission Environments and Wired/Wireless Protocols, Prentice Hall, 20.
3. Ana Minaburo , Laurent Toutain, Local Networks and the Internet: From Protocols to
4. Interconnection, John Wiley and Sons, 201.

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C 3/0/0/3**

INFORMATION THEORY AND CODING (C55PE5D)

Course Objective:

Explain entropy, mutual information and characteristics of various types of noisy communication channels, discuss various source coding schemes and channel coding techniques for error-free transmission of message over a noisy communication channel.

Course Outcomes:

Upon completion of the course, the student will

1. Understand the concept of information and entropy –L2
2. Demonstrate the properties of codes and understand Shannon 's theorem for coding-L3
3. Compute channel capacity and apply mechanism for sharing mutual information –L3
4. Compare the finite geometric codes–L4
5. Understand application of Convolutional Codes –L5

UNIT I

Information And Sources: The Definition of Information, The Zero-memory Information Source, Properties of Entropy, Extensions of a Zero-memory Source, The Markov Information Source

UNIT II

Properties Of Codes: Uniquely Decodable Codes, Instantaneous Codes, Construction of an Instantaneous code, Kraft Inequality—Statement

Coding Information Sources: The Average Length of a Code, Method of Encoding for Special Sources, Shannon's Theorem for Markov Sources, Coding without Extensions, Finding Binary Compact Codes—Huffman Code.

UNIT III

Channels And Mutual Information: Information Channels, Probability Relations in a Channel,A Priori and A Posteriori Entropies, A Generalization of Shannon's Theorem, Mutual Information,Properties of Mutual Information, Noiseless Channels and Deterministic Channels,Cascaded Channels,Reduced Channels and Sufficient Reductions, Additivity of Mutual Information, Mutual Information of Several Alphabets, Channel Capacity, Conditional Mutual Information

UNIT IV

Finite Geometry Codes: Euclidean geometry, Majority Logic Decodable Cyclic codes based on Euclidean geometry, Projective geometry and projective geometry codes, Modifications of Majority-Logic Decoding, Single-Burst-Error-Correcting odes, Interleaved codes, Phased-Burst-Error-Correcting-Codes

UNIT V

Application Of Convolutional Codes: Applications of viterbi Decoding, Sequential Decoding,

Majority-Logic-Decoding, Burst-Error-Correction, Convolutional Codes in ARQ Systems

Text Books:

1. N. Abramson, Information and Coding, McGraw Hill, 1963.
2. Shu Lin and D.J. Costello Jr., Error Control Coding, Prentice Hall, 1983.

Reference Books:

1. Principles of Communication Systems-Herbert Taub, Donald L schilling, Goutham Saha, 3rd Edition, McGraw Hill, 2008.
2. Digital and analog communication systems-Sam Shanmugam, John Wiley, 2005.
3. Digital communication—Simon Haykin, John Wiley, 2005.
4. Communication Systems-B.P.Lathi, BS Publications 2006

COMPUTER SCIENCE & ENGINEERING

B.Tech.V Semester **L/T/P/C 3/0/0/3**

SOFTWARE PROCESS AND PROJECT MANAGEMENT (C55PE5E)

Course Objective:

The objective of the course is to focus of principles, techniques, methods & tools for model-based management of software projects. Assurance of product quality and process adherence (Quality assurance), as well as experience based creation & improvement of models.

Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand conventional software management and improving software economics- L2
2. Analyze principles of modern software management and improving software economics – L4
3. Demonstrate life cycle phases and model based software architectures – L3
4. Analyze work flows of the process and Line- of- Business organization-L4
5. Develop future software project management , project control ,process instrumentation and various case studies-L5

UNIT I

Conventional Software Management

The waterfall model, RAD model, Iterative model, Spiral model, Prototype model and COCOMO model, conventional software management performance.

Evolution of Software Economics:

Software economics, pragmatic software cost estimation.

UNIT II

Improving Software Economics

Reducing software product size, improving software process, improving team effectiveness. Improving automation, Achieving required quality, peer inspections. The old way and the new the principles of conventional software engineering. Principles of modern software management, transitioning to an iterative process.

UNIT III

Life Cycle Phases

Engineering and production stages, inception, elaboration, construction, transition phases. Artifacts of the process: the artifact sets. Management artifacts, engineering artifacts, programmatic artifacts. Model based software architectures: A Management perspective and technical perspective.

UNIT IV

Work Flows of the Process

Software process workflow, Inter trans workflows. Checkpoints of the process: Major Mile stones, Minor Milestones, periodic status assessments. Iterative process planning work breakdown structures, planning guidelines, cost and scheduled estimating, interaction, planning process, pragmatic planning. Evolution of Project Organization, Project Organizations and responsibilities, Line-of-Business organization.

UNIT V

Project Control and Process Instrumentation:

The seven core metrics, management indicators, and quality indicators. Life cycle expectations,

pragmatic software Metrics, Metrics Automation. Tailoring the Process: Process discriminates, example.

Future Software Project Management

Modem project profiles next generation software economics modem process transitions.

Case Study

The Command Center Processing and Display System. Replacement (CCPDS-R).

Text Books:

1. Software Project Management. Walker Royce, Pearson Education.

Refernce Books:

1. Applied Software Project Management, Andrew Stebian, & Jennifer Greene, O'Reilly 206.
2. Software Engineering Project Management. Richard H. Thayer & Edward Yourdon, Second edition, Wiley India, 204.
3. Software Project Management in Practice Pankaj Jalote Pearson education.
4. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, Tata MC Graw Hill.

COMPUTER SCIENCE & ENGINEERING

B.Tech V Semester **L/T/P/C 3/0/0/3**

ARTIFICIAL INTELLIGENCE (C55PE5F)

Course Objectives:

To train the students to understand different types of AI agents, various AI search algorithms, fundamentals of knowledge representation, building of simple knowledge-basedsystems and to apply knowledge representation, reasoning.

Course Outcomes:

Upon completion of the course, the student will be able to

1. Gain knowledge on AI phenomenon, use state space representations and apply heuristic techniques- L3
2. Apply knowledge representation issues to build predicate logic and knowledge rules-L3
3. Understand the uncertainty measures for symbolic reasoning and infer knowledge in statistical reasoning –L2
4. Compare and contrast among weak and strong slots filter structures.-L4
5. Analyze the game playing techniques of AI, plan and build a system- L4

UNIT I

What is Artificial Intelligence?

The Al Problems , The Underlying Assumption, What is an Al Technique?

Problems, Problem Spaces. and Search

Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs, Additional problems

Heuristic Search Techniques

Generate-and-Ted, Hill Climbing, Rest-first Search, Problem Reduction, Constraint Satisfaction, Means-ends Analysis

UNIT II

Knowledge Representation Issues:

Representations and Mappings, Approaches to Knowledge Representation, Issues in Knowledge Representation, The Frame Problem

Using Predicate Logic

Representing Simple Facts in Logic, Representing Instance and ISA Relationships, Computable Functions and Predicates, Resolution, Natural Deduction

Representing Knowledge Using Rules

Procedural Versus Declarative Knowledge, Logic Programming, Forward Versus Backward Reasoning, Matching, Control Knowledge IP

UNIT III

Symbolic Reasoning Under Uncertainty:

Introduction to Non monotonic Reasoning, Logics for Non monotonic Reasoning, Implementation Issues, Augmenting a Problem-solver, Implementation: Depth-first Search, Implementation: Breadth-first Search

Statistical Reasoning
Probability and Bayesian Theorem, Certainty Factors and Rule-based Systems, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic

UNIT IV
Weak Slot-and-Filler Structures: Semantic Nets, Frames
Strong Slot-and-Filler Structures: Conceptual Dependency, Scripts, CYC 216

UNIT V
Game Playing
The Minimax Search Procedure, Adding Alpha-beta Cutoffs, Additional Refinements, Iterative Deepening, References on Specific Games
Planning:
An Example Domain: The Blocks World, Components of a Planning System, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems, Other Planning Techniques

Text Book:

1. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivasankar B. Nair, The McGraw Hill publications, Third Edition, 2009.

Reference Books:

1. Russell, S. and Norvig, P, Artificial Intelligence: A Modern Approach, Third Edition, Prentice Hall, 2010.
2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

COMPUTER SCIENCE & ENGINEERING

B.Tech V Semester **L/T/P/C**
3/0/0/3

EMBEDDED SYSTEMS DESIGN (C055OE6)

COURSE OBJECTIVES:

1. To provide an overview of Design Principles of Embedded System.
2. To provide clear understanding about the role of firmware, operating systems in correlation with hardware systems.

COURSE OUTCOMES:

1. Understands the basic concepts of Embedded Systems
2. Formulates typical Embedded System
3. Illustrates the trends in Embedded Industry
4. Outlines the concepts of RTOS based Embedded System Design
5. Analyze Task Communication in RTOS

UNIT – I:

Introduction to Embedded Systems: Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems.

UNIT – II:

Typical Embedded System: Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off-The-Shelf Components (COTS). Embedded Firmware: Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages.

UNIT – III:

Trends in Embedded Industry: Processor Trends in Embedded Systems, Embedded OS Trends, Development Language Trends, Open Standards, Frameworks & Alliances, Bottlenecks, Development Platform Trends, Cloud, Internet Of Things (IoT) & Embedded Systems. Communication Interface: Onboard and External Communication Interfaces.

UNIT –IV:

RTOS Based Embedded System Design: Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

UNIT –V:

Task Communication: Shared Memory, Message Passing, Remote Procedure, Call and Sockets, Task Synchronization: Task Communication/Synchronization Issues, Task Synchronization Techniques, Device Drivers, How to Choose an RTOS

TEXT BOOKS

1. Introduction to Embedded Systems - Shibu K.V, Mc Graw Hill.

REFERENCE BOOKS

1. Embedded Systems - Raj Kamal, Mc Graw Hill Education.
2. Embedded System Design - Frank Vahid, Tony Givargis, John Wiley.
3. Embedded Systems - Lyla, Pearson, 2013
4. An Embedded Software Primer - David E. Simon, Pearson Education.

COMPUTER SCIENCE & ENGINEERING

B.Tech. V Semester **L/T/P/C**
0/0/2/1

OBJECT-ORIENTED ANALYSIS AND DESIGN LAB (C55PC7)

Course Objective:

Learn the basics of object oriented analysis and design skills. Be exposed to the UML design diagrams and to map design to code, be familiar with the various testing techniques.

Course Outcomes:

1. Design and implement projects using OO concepts-L5
2. Use the UML analysis and design diagrams-L3
3. Apply appropriate design patterns-L3
4. Create code from design –L5
5. Compare and contrast various testing techniques-L4

List of Experiments:

Consider the following three case studies:
Online course reservation system E-ticketing Library Management System

Week 1

Familiarization with Rational Rose or Umbrella, for each case study develop a problem statement.

Week 2, 3 & 4:

For each case study:

1) Identify and analyze events
2) Identify Use cases
3) Develop an event table
4) Identify & analyze domain classes
5) Represent use cases and a domain class diagram using Rational Rose
6) Develop a CRUD matrix to represent relationships between use cases and problem domain classes

Week 5 & 6:

For each case study:

1) Develop Use case diagrams
2) Develop elaborate Use case descriptions &scenarios
3) Develop prototypes (without functionality)
4) Develop system sequence diagrams

Week 7, 8, 9 & 10:

For each case study:

1) Develop high-level sequence diagrams for each use case
2) Identify MVC classes/objects for each use case
3) Develop Detailed Sequence Diagrams / Communication diagrams for each use case showing interactions among all the three-layer objects
4) Develop detailed design class model (use GRASP patterns for responsibility assignment)
5) Develop three-layer package diagrams for each case study

Week 11 & 12:
For each case study:

1) Develop Use case Packages
2) Develop component diagrams
3) Identify relationships between use cases and represent them
4) Refine domain class model by showing all the associations among classes

Week 13 onwards:
For each case study:

1) Develop sample diagrams for other UML diagrams – state chart diagrams, activity diagrams, and deployment diagrams

Computer Science & Engineering – R20

B.Tech. V Semester **L/T/P/C**
0/0/2/1

PYTHON PROGRAMMING LAB (C55PC8)

Course Objective:

Write and execute the programs based on operators, functions, simple data structures, basic packages using python programming constructs.

Course Outcomes:

After completion of course the student will be able to

1. Use fundamental programming elements : operators ,statements, conditional andcontrol flow statements-L3
2. Compare & contrast predefined functions and build functions- L4
3. Solve various computing problems using python modules and data structures –L4
4. Apply oops concepts using python –L3

List of programs

1. Write a python program to print ‑HelloWorld‖.
2. Running instructions in Interactive interpreter and a Python Script.
3. Write a Python Programming to demonstrate the Indentation.
4. Write a Python program to calculate number of days between two dates.
5. Write a python program that takes 2 numbers as command line arguments and prints its product.
6. Write a Python program to test whether a given letter is a vowel or not.
7. Write a Python program to create a pattern.

```
*
**
***
****
*****
```

8. Write a Python program to count the number 6 in a given list.
9. Write a python program to find the sum of the first n positive integers.
10. Write a Python program to calculate the sum of the digits in an integer
11. Write a Python program that prints all the numbers from 0 to 50 except multiples of 10
12. Write a Python program to check if a number is positive, negative or zero.
13. Write a Python program that will accept the base and height of a triangle nd compute the area.

14. Write a Python program to compute the greatest common divisor (GCD) of two positive integers.
15. Write a Python program Make a Simple Calculator
16. Write a Python program to count the number of even and odd numbers from a series of numbers.
17. Write a Python function to calculate the factorial of a number(anon-negative integer).The function should accept the number as an argument.
18. Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.
19. Write a Python function that checks whether a passed string is palindrome or not.
20. Write a Python program to get the Fibonacci series between 0 to 50usingrecursion
21. Write a Python program to calculate the value of 'a' to the power 'b' using recursion.
22. Write a Python program to get the factorial of a non-negative integer using recursion
23. Write a Python program to calculate the length of a string.
24. Write a Python program to count occurrences of a substring in a string.
25. Write a Python program to count and display the vowels of a given text.
26. Write a program to count the numbers of characters in the string and store them in a dictionary data structure
27. Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.
28. Write a program combine lists that combines these lists into a dictionary.
29. Write a Python program for binary search.
30. Write a Python program to sort a list of elements using the bubble sort algorithm
31. Write a Python program to sort a list of elements using the quick sort algorithm.
32. Write a Python program to count the frequency of words in a file.
33. Write a Python program to print last n lines of a file.
34. Write a Python program to combine each line from first file with the corresponding line in second file.
35. Write a Python program to assess if a file is closed or not.
36. Write a Python program to get the Python version you are using.
37. Write a Python program to display the current date and time.
38. Write a Python program to print the calendar of a given month and year.
39. WriteaPythonclasswhichhastwomethodsget_Stringandprint_String.get_Stringaccepta string from the user and print_String print the string in uppercase.
40. Write a Python class named Rectangle constructed by length and width and a method which will compute the area of a rectangle.
41. Solve the following linear equations using scipy library X+3y+5z=10 2x+5y+z=8 2x+3y+8z=3
42. Find the determinant for a 2 * 2 matrix using scipy library module.
43. Find the mean and variance for the following data using scipy [2,23,45,56,78,89,13,33,66,89]

44. Draw a barchart with the following data using matplot lib Men_mean=[20,35,30,35,27] Women_mean=[25,32,34,20,25], Men_std=[2,3,4,1,2] Women_std=[3,5,2,3,3]
45. Using matplot lib and scipy libraries, apply the following operations on an image.
    a) Display the image crop image
    b) flip
    c) rotate
    d) Display the statistical information of the image
    e) Turn upside down

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C**
3/0/0/3

DATA WAREHOUSING AND DATA MINING (C56PC1)

Course Objectives:

Learn data warehouse principles and data mining concepts .

Course Outcomes:

Upon completion of the Course, the student will be able to

1. Understand insights on the necessity of building a data Warehouse, and basic operations that canbe performed on it –L2
2. Understand the basics data mining ,challenges and functionalities –L2
3. Analyze the algorithms developed for understanding Association rule functionality-L4
4. Compare and contrast various classification algorithms-L4
5. Analyze grouping of similar knowledge based on the information, and study different approaches proposed for grouping the information –L5

UNIT I

Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses. Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction – Transformation – Loading, Logical (Multi – Dimensional), Data Modeling, Schema Design, Star and Snow – Flake Schema, Fact Constillation, Fact Table, OLAP Cube, OLAP Operations, OLAP Server Architecture – ROLAP, MOLAP and HOLAP.

UNIT II

Introduction to Data Mining: Introduction, What is Data Mining, Definition, KDD, Challenges, Data Mining Tasks, Data Preprocessing, Data Cleaning, Missing data, Dimensionality Reduction, Feature Subset Selection, Discretization and Binarization, Data Transformation; Measures of Similarity and Dissimilarity- Basics.

UNIT III

Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set-Maximal Frequent Item Set, Closed Frequent Item Set.

UNIT IV

Classification: Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naïve – Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

UNIT V

Clustering: Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms, Partitioning Clustering-K-Means Algorithm, K-Means Additional issues, PAM Algorithm;

Hierarchical Clustering-Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithm, Specific techniques, Key Issues in Hierarchical Clustering, Strengths and Weakness; Outlier Detection.

Text Books:

1. Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufman Publishers, Elsevier, 2 Edition,206.
2. Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Stein banch, Pearson Education

.

Reference Books:

1. Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
2. Data Warehousing Fundamentals, Paulraj Ponnaiah, Wiley Student Edition.
3. The Data Ware housinG Life Cycle Toolkit – Ralph Kimbal. Wiley Student Edition.
4. Data Mining, Vikaram Pudi, P Radha Krishna, Oxford University Press.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C**
3/0/0/3

WEB TECHNOLOGIES (C56PC2)

Course Objective:

To understand the concepts of PHP Language, processing of XML data with Java, server side programming with Java servlets and JSP.

Course Outcomes:

Upon completion of the course, the student will

1. Understand basics of server side scripting using PHP – L2
2. Illustrate well formed XML programs and how to parse, use XML data with JAVA – L3
3. Design server side programming applications with servlets– L5
4. Develop programs using JSP for various applications –L5
5. Write programs with knowledge of client side scripting , validation of forms and AJAX programs – L4

UNIT I

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

UNIT II

XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model, XHTML Parsing XML Data – DOM and SAX Parsers in java.

UNIT III

Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading
Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT IV

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

UNIT V

Client-side Scripting: Introduction to Javascript: Javascript language – declaring variables, the scope of variables, functions, event handlers (click, onsubmit etc.), Document Object Model, Form validation. Simple AJAX application.

Text Books:

1. Web Technologies, Uttam K Roy, Oxford UniversityPress.
2. The Complete Reference PHP – Steven Holzner, TataMcGraw-Hill.

Reference Books:

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech.
2. Java Server Pages –Hans Bergsten, SPD O'Reilly Java Script, D. Flanagan,O'Reilly,SPD.
3. Beginning Web Programming-Jon Duckett WROX.
4. Programming World Wide Web, R. W. Sebesta, Fourth Edition, Pearson.
5. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C 3/0/0/3**

ADVANCED DATABASES (C56PE3A)

Course Objective:

Learn the foundation in advanced database concepts from an industry perspective.

Course Outcomes:

Upon completion of the course, the student will

1. Understand the database system architecture and concepts of parallel databases-L2
2. Illustrate Object databases, and XML databases –L3
3. Compare & contrast the significance and concepts of Information retrieval, apply them in implementingtransaction management features –L4
4. Understand the concepts of advance transaction processing, advance application development,spatial and temporal data Mobility –L2
5. Understand the address the prelims of security issues over advance database concepts –L2

UNIT I

Database system Architecture: computer-system architecture, and describes the influence of the underlying computer system on the database system.

Parallel databases: explores a variety of parallelization techniques, including I/O parallelism, inter query and intra query parallelism, and interoperation and intra operation parallelism. Query optimization, Design of parallel Systems, Parallelism on Multi Core Processors.

UNIT II

Object Based Databases: Complex data types, Structured types and Inheritance in SQL, Table Inheritance, Array and Multi set types in SQL, Object-Identity and Reference types in SQL, Implementing O-R features, Persistent Programming Languages, Object-Oriented versus Object-Relational.

XML Databases: Structure of XML data, XML document schema, Querying and Transformation, API to XML, Storage of XML data, XML applications.

UNIT III

Information Retrieval: Relevance ranking using Terms, Relevance using Hyperlinks, Synonyms, Homonyms and Ontologies, Indexing of Documents, Measuring Retrieval Effectiveness, Crawling and Indexing the web, Beyond ranking of pages, Directories and Categories.

UNIT IV

Advance application Development: Performance Tuning, Performance Benchmarks, Other Issues in Application Development, Standardization.

Spatial and Temporal data Mobility: Motivation, Time in Databases, Spatial and Geographical Data Geographic Data, Multimedia Databases, Mobility and Personal databases.

Advance Transaction Processing: Transaction-Processing Monitors, Transactional Workflows, E-commerce, Main-memory databases, Real-Time Transaction Systems, Long-Duration Transactions.

UNIT V

Introduction to database security issues, Discretionary access control based on granting and revoking privileges; Mandatory access control and role based access control for multilevel security. SQL Injection, Introduction to statistical Database Security, Introduction to flow control, Encryption and Public Key Infrastructures, Privacy issues and preservation, challenges to maintaining database security.

Text Books:

1. Database Systems concepts 6th edition silberschatz-korth-surdarshan Tata Mc Graw Hill Publications (Indian Edition)
2. Fundamentals of Database systems seventh edition Pearson Publications by Ramez Elmasri, Shamakanth.B. Navathe

Reference Books:

1. Distributed Databases Stefeno Ceri & Guiseppe Pelagatti TataMCgrewHill Edition.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C 3/0/0/3**

MOBILE COMPUTING (C56PE3B)

Course Objective:

Computer systems perspective on the converging areas of wireless networking, embedded systems, and software, and to introduce selected topics of current research interest in the field.

Course Outcomes:

Upon completion of the course, the student will

1. Understand mobile communications and limitations of mobile devices- L2
2. Illustrate the architecture of GSM protocol and MAC layer-L3
3. Compare and contrast various mobile IP network layer and mobile transport layer – L3
4. Demonstrate database hoarding techniques and data dissemination for broadcasting –L3
5. Compare & contrast the ad hoc networks and related concepts.-L3

UNIT I

MOBILE COMMUNICATIONS: AN OVERVIEW: Mobile Communication, Mobile Computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Data Dissemination, Mobility Management, Security.

MOBILE DEVICES AND SYSTEMS:

Cellular Networks and Frequency Reuse, Mobile Smart phones, Smart Mobiles, and Systems, Handheld pocket Computers, Handheld Devices, Smart Systems, Limitations of Mobile Devices.

UNIT II

GSM AND OTHER 2G ARCHITECTURES:

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA,.

UNIT III

Mobile IP Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP, VoIP, TCP over 2.5G/3G Mobile Networks

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

UNIT IV

DATABASES AND MOBILE COMPUTING:

Database Hoarding Techniques, Data Caching, Client-Server Computing for Mobile Computing and Adaptation, Adaptation Software for Mobile Computing, Power-aware Mobile Computing, Context-aware Mobile Computing

DATA DISSEMINATION AND SYSTEMS FOR BROADCASTING: Classification of Data Delivery Mechanisms, Data Dissemination, Digital Audio Broadcasting (DAB), Digital Video Broadcasting.

UNIT V

Mobile Adhoc Networks (MANETs):

Introduction to Mobile Ad-hoc Network, MANET, Routing and Routing Algorithms

MOBILE WIRELESS SHORT-RANGE NETWORKS AND MOBILE:

Wireless LAN, 802.11 Architecture, and Protocol Layers, Wircless Application Protocol (WAP), Wircless Application Protocol-WAP 2.0

MOBILE APPLICATION DEVELOPMENT PLATFORMS:

Windows Mobile and CE, Windows Phone 7, Android, Symbian

Text Books:

1.Mobile Computing by Raj Kamal second edition Oxford Higher Education.

Reference Books:

1. Jochen Schiller, ‑Mobile Communications‖, Addison-Wesley, Second Edition, 2004.
2. Stojmenovic and Cacute, ‑Handbook of Wireless Networks and Mobile Computing‖, Wiley, 2002, ISBN 0471419028.
3. Reza Behravanfar, ‑Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML‖, ISBN: 0521817331, Cambridge University Press, Oct 2004.
4. Jochen Schiller, ‑Mobile Communications‖, Addison-Wesley, Second Edition, 2009.
5. Ad hoc Wireless Networks, Architectures and Protocols,C.Siva Ram Murthy and B.S.Manoj.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C**
3/0/0/3

WIRELESS NETWORKS (C56PE3C)

Course Objectives:

Learn about the issues and challenges in the design of wireless ad hoc networks. The working of MAC and Routing Protocols for ad hoc and sensor networks.

Course Outcomes:

On successful completion of the course the students will be able to

1. Understand the various issues and applications of Ad hoc wireless networks-L2
2. Understand the working of MAC protocols for Ad-hoc wireless networks- L2
3. Compare and contrast the working of various On-Demand Routing protocols-L3
4. Analyze the challenges in designing Transport layer Protocols for Ad-hoc networks, Compare and contrast the working of Transport protocols - L4
5. Design the issues in designing Security Protocols for Ad-hoc networks focusing on the working performance of various security protocols-L5

UNIT I

Introduction:

Fundamentals Of Wireless Communication Technology, The Electromagnetic Spectrum, Radio Propagation Mechanisms, Characteristics Of The Wireless Channel, Modulation Techniques, Multiple Access Techniques, Error Control,

Wireless LANs and PANs:

Fundamentals of Wlans, IEEE802.11 Standard, Hiper lan Standard, Bluetooth, Home rf

UNIT II

MAC Protocols for Ad hoc wireless Networks: Issues in designing a MAC protocol for Ad hoc wireless Networks, Design goals of a MAC protocol for Ad-hoc wireless Networks, Classification of MAC Protocols, Contention based protocols, Contention based protocols with reservation mechanisms, Contention-Based MAC protocols With Scheduling Mechanisms, MAC protocols That Use Directional Antennas, Other MAC protocols.

UNIT III

Routing protocols for Ad-hoc Wireless Networks: Issues in Designing a Routing Protocol for Ad-hoc Wireless Networks, Classification of Routing Protocols. Table driven routing Protocols, On-Demand Routing Protocols. Hybrid Routing Protocols, Routing Protocols With Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power-Aware Routing Protocols

UNIT IV

Transport Layer And Security Protocols For Ad Hoc Wireless Networks:

Issues in Designing a Transport Layer Protocol for Ad-hoc wireless Networks, Design Goals of a Transport Layer Protocol for Adhoc wireless Networks, Classification of Transport Layer Solutions, TCP over Ad-hoc wireless Networks, Other Transport Layer Protocols For Ad Hoc Wireless Networks, Security In Ad Hoc Wireless Networks, Network Security Requirements, Issues And Challenges In Security Provisioning, Network Security Attacks, Key Management, Secure Routing In Ad Hoc Wireless Networks.

UNIT V

Quality Of Service In Ad Hoc Wireless Networks:

Issues And Challenges In Providing Qos In Ad Hoc Wireless Networks, Classifications Of Qos Solutions, Mac layer Solutions, Network Layer Solutions, Qos Frameworks For Ad Hoc Wireless Networks.

Text Book:

1. Ad hoc Wireless Networks– C. Siva Ram Murthy & B.S. Manoj, 2nd Edition, Pearson Education, 2005.

Reference Books:

1. Ad hoc Wireless Networks – Ozan K. Tonguz and Gianguigi Ferrari, JohnWiley, 2006.
2. Ad hoc Wireless Networking – Xiuzhen Cheng, Xiao Hung, Ding-Zhu Du,Kluwer Academic Publishers,2004.
3. Adhoc Mobile Wireless Networks - C.K. Toh, Protocols and Systems, Prentice-Hall PTR,200.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C 3/0/0/3**

CRYPTOGRAPHY (C56PE3D)

Course Objective:

Describe goals and design principles for and common structures of secret key primitives such as block and stream ciphers and message authentication codes

Course Outcomes:

Upon completion of the Course, the student will be able to

1. Understand how to encrypt the information using classical techniques like, symmetry, substitution, and steganography- L2
2. Apply techniques to generate pseudo random sequences, use stream ciphers tofor encrypting and decrypting the data –L3
3. Understand about Number theory, a mathematical notation of representinginformation – L2
4. Illustrate the principles of public key crypto systems to encrypt and decrypt the information- L3
5. Understand various algorithms developed for hassing functions; choose one way hashing functions like, Message Authentication codes, Digital Signal Algorithm, Discrete Logarithm Signature- L2

UNIT I

Basic Concepts of Number Theory and Finite Fields:

Divisibility and the divisibility algorithm, Euclidean algorithm, Modular arithmetic, Groups, Rings and Fields, Finite fields of the form GF(p), Polynomial arithmetic, Finite fields of the form GF(2n).

UNIT II

Classical Encryption Techniques:

Symmetric cipher model, Substitution techniques, Transposition techniques, Steganography

SYMMETRIC CIPHERS:

Traditional Block Cipher structure, Data Encryption Standard (DES) , AES Cipher.

UNIT III

Pseudo-Random-Sequence Generators and Stream Ciphers:

Linear Congruential Generators, Linear Feedback Shift Registers, Design and analysis of stream ciphers, Stream ciphers using LFSRs.

UNIT IV

Number theory:

Prime Numbers, Fermat_s and Euler_s theorem, Primality testing, Chinese Remainder theorem, discrete logarithm.

Principles of Public-Key Cryptosystems:

The RSA algorithm, Diffie - Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

UNIT V

One-Way Hash Functions:

Background, N-Hash, MD4, MD5, Secure Hash Algorithm [SHA],One way hash functions using symmetric block algorithms, Using public key algorithms, Choosing a one-way hash functions, Message Authentication Codes. Digital Signature Algorithm, Discrete Logarithm Signature Scheme.

Text Books:

1. William Stallings, ―Cryptography and Network Security Principles and Practice‖, Pearson Education Inc., 6th Edition, 204, ISBN: 978-93-325-1877-3
2. Bruce Schneier, ―Applied Cryptography Protocols, Algorithms, and Source code in C‖, Wiley Publications, 2nd Edition, ISBN: 9971-51-348-X

Reference Books:

1. Cryptography and Network Security, Behrouz A. Forouzan, TMH, 207.
2. Cryptography and Network Security, Atul Kahate, TMH, 20.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C 3/0/0/3**

SOFTWARE REQUIREMENTS ESTIMATION (C56PE3E)

Course Objective:

Understand good practices for requirements engineering, requirements elicitation, elicitation techniques, analysis models, software quality attributes. software estimation , size estimation , schedule and cost estimation

Course Outcomes:

Upon completion of the Course, the student will

1. Understand the requirements are, necessary to build a software using good practices of engineering - L2
2. Analyze the developed models for a software –L4
3. Illustrate make estimations, across modules of a software –L3
4. Apply cost estimations based on schedule and effort for developing efficient software modules. –L3
5. Design various tools that exist for software estimation- L5.

UNIT I

Software Requirements: What and Why:

Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management.

Software Requirements Engineering:

Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality.

UNIT II

Software Requirements Management:

Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirement Traceability Matrix, Links in requirements chain.

Software Requirements Modeling:

Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames.

UNIT III

Software Estimation: Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation.
Size Estimation: Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures.

UNIT IV

Effort, Schedule and Cost Estimation: What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation.

UNIT V

Tools for Requirements Management and Estimation Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation. **Software Estimation Tools:** Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLCM (Software Life Cycle Management) Tools.

Text Books:

1. Swapna Kishore, Rajesh Naik, Software Requirements and Estimation, 1st Edition, Tata Mc Graw Hill, 20.

Reference Book:

1. Karl E. Weigers, Software Requirements, 2nd Edition, Microsoft Press, 20.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C 3/0/0/3**

MACHINE LEARNING (C56PE3F)

Course Objective:

Understand formulate machine learning problems corresponding to different applicationsand range of machine learning algorithms along with their strengths and weaknesses.

Course Outcomes:

Upon completion of the Course, the student will

1. Design a learning system based on well-posed problems, study perspectives issues in machine learning-L5
2. Understand the basic phenomenon of artificial neural networks and infer the evaluation hypothesis mechanism for learning mechanism. -L2
3. Apply bayes theory, computational theory, and instance base on learning mechanism. Classify the learnt information based on hypothesis for predicting probabilities- L3
4. Apply set of rules and analyze the learning mechanism with perfect domain theories like PROLOG-EGB –L4.
5. Compare and contrast combine inductive and Analytical learning approaches –L4

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 indecision 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.

Evaluation Hypotheses – Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses

UNIT III

Bayesian Learning – Overview of -Bayes theorem principle, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities , Minimum Description Principle, Bayes optimal Classifier, Gibs algorithm, Navie Baysean Classifier.

Computational Learning Theory – Introduction, Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis Space,

Instance-Based Learning- Introduction, k -Nearest Neighbour Learning, Locally Weighted

Regression, Radial Basis Functions, Case Based Reasoning, Remark son Lazy and Eager Learning

UNIT IV

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, and Learning Rule.
Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL.
Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG, Remarks on Explanation- Based Learning-Discovering new features,

UNIT V

Combining Inductive and Analytical Learning – Motivation, Inductive- Analytical approaches to Learning, Reinforce learning task and Q Learning.

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 W Hsieh, Cambridge University Press.
2. Richard o.Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc.,20
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C 3/0/0/3**

INTRODUCTION TO ANALYTICS (C56PE4A)

Course Objective:

Understand the overview of analytics, descriptive statistical & multivariate Analysis, clustering & regression techniques.

Course Outcomes:

On completion of course the student will be able to

1. Use the concepts of Big Data, Data Science and Descriptive Statistics. – L3
2. Analyze descriptive multivariate analysis and various preprocessing techniques. - L4
3. Apply different clustering and regression methods. - L4
4. Apply additional predictive methods and classifications techniques on different data sets. - L3
5. Demonstrate various text, web and social media applications. - L3

Unit-I

Introduction: Big Data and Data Science, Big Data Architectures, Small Data, What is Data?

What Can We Do With Data?: A Project on Data Analytics - A Little History on Methodologies for Data Analytics, The KDD Process, The CRISP-DM Methodology

Descriptive Statistics: Scale Types, Descriptive Univariate Analysis - Univariate Frequencies, Univariate Data Visualization, Univariate Statistics, Common Univariate Probability Distributions, Descriptive Bivariate Analysis

Unit-II

Descriptive Multivariate Analysis: Multivariate Frequencies, Multivariate Data Visualization, Multivariate Statistics - Location Multivariate Statistics, Dispersion Multivariate Statistics, Infographics and Word Clouds

Data Quality and Preprocessing: Data Quality - Missing Values, Redundant Data, Inconsistent Data, Noisy Data, Outliers.

Converting to a Different Scale Type - Converting Nominal to Relative, Converting Ordinal to Relative or Absolute, Converting Relative or Absolute to Ordinal or Nominal

Converting to a Different Scale, Data Transformation,

Dimensionality Reduction - Attribute Aggregation, Principal Component Analysis, Independent Component Analysis, Attribute Selection, Filters, Wrappers, Embedded, Search Strategies

Unit-III

Clustering: Distance Measures - Differences between Values of Common Attribute Types, Distance Measures for Objects with Quantitative Attributes, Distance Measures for Non-conventional Attributes, Clustering Validation

Regression: Predictive Performance Estimation - Generalization, Model Validation, Predictive Performance Measures for Regression

Finding the Parameters of the Model - Linear Regression, Empirical Error, The Bias-variance Trade-off, Shrinkage Methods, Ridge Regression, Lasso Regression, Methods that use Linear Combinations of Attributes, Principal Components Regression, Partial Least Squares Regression, Technique and Model Selection

Unit-IV

Additional Predictive Methods: Search-based Algorithms - Decision Tree Induction Algorithms, Decision Trees for Regression, Model Trees, Multivariate Adaptive Regression Splines,

Optimization-based Algorithms - Artificial Neural Networks, Back propagation, Deep Networks and Deep Learning Algorithms, Support Vector Machines, SVM for Regression

Advanced Predictive Topics: Ensemble Learning - Bagging, Random Forests, AdaBoost,

Algorithm Bias,

Non-binary Classification Tasks - One-class Classification, Multi-class Classification, Ranking Classification, Multi-label Classification, Hierarchical Classification

Unit-V

Applications for Text, Web and Social Media: Working with Texts - Data Acquisition, Feature Extraction, Tokenization, Stemming, Conversion to Structured Data, Is the Bag of Words Enough?, Remaining Phases, Trends, Sentiment Analysis, Web Mining

Recommender Systems - Feedback, Recommendation Tasks, Recommendation Techniques, Knowledge-based Techniques, Content-based Techniques, Collaborative Filtering Techniques, Final Remarks

Social Network Analysis - Representing Social Networks, Basic Properties of Nodes, Degree, Distance, Closeness, Betweenness, Clustering Coefficient, Basic and Structural Properties of Networks, Diameter, Centralization, Cliques, Clustering Coefficient, Modularity, Trends and Final Remarks

Text Book(s)

1. A General Introduction to Data Analytics João Mendes Moreira André C.P.L.F. deCarvalho , wiley publishers

Reference

1. Introduction to Business Analytics using simulation, Jonathan P.Pinder, Academic Press (Elsevier).
2. Data mining and predictive Analytics: Daniel T Larose, Chatnal D Larose, Wiley.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C**
3/0/0/3

CLOUD COMPUTING (C56PE4B)

Course Objective:

Understand the knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing the state-of-the-art in Cloud Computing fundamental issues, technologies, applications.

Course Outcomes:
Upon completion of the course, the student will

1. Understand the basic concepts of cloud computing and process of migrating into a cloud- L2
2. Understand the paradigm for the cloud era using integration as a service, and the phenomenon of enterprise cloud computing paradigm.-L2
3. understand the concepts of, infrastructure as a service (IAAS), Platform and software as a service –L2
4. Compare &contrast to manage, monitor, and apply a cloud, using governance.-L4
5. Develop different cloud services-L5

UNIT I
Introduction to Cloud Computing: Cloud Computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks
Migrating into a Cloud: Introduction, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud

UNIT II
Enriching the 'Integration as a Service' Paradigm for the Cloud Era: The Onset of Knowledge Era, The Evolution of SaaS, The Challenges of SaaS Paradigm, Approaching the SaaS Integration Enigma, New Integration Scenarios, The Integration Methodologies, SaaS Integration Products and Platforms, SaaS Integration Services, Businesses-to-Business Integration (B2Bi) Services, A Framework of Sensor—Cloud Integration, SaaS Integration Appliances
The Enterprise Cloud Computing Paradigm: Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers Toward a Marketplace for Enterprise Cloud Computing, The Cloud Supply Chain

UNIT III
Infrastructure as a Service (IAAS) & Platform and Software as a Service (PAAS / SAAS): Virtual machines provisioning and Migration services, On the Management of Virtual machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a cluster as a Service, Secure Distributed Data Storage in Cloud Computing .Aneka, Comet Cloud, T-Sytems', Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments.

UNIT IV
Monitoring, Management and Applications: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing, Performance Prediction for HPC on Clouds, Best Practices

in Architecting Cloud Applications in the AWS cloud, Building Content Delivery networks using Clouds, Resource Cloud Mashups.

UNIT V

Governance and Case Studies: Organizational Readiness and Change management in the Cloud age, Data Security in the Cloud, Legal Issues in Cloud computing, Achieving Production Readiness for Cloud Services.

Text Books:

1. Cloud Computing:Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, W iley, 2011.

Reference Books:

1. A Practical Approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill, 2011.
2. Enterprise Cloud Computing, Gautam Shroff, Cambridge University Press, 2010.
3. Cloud Computing: Implementation, Management and Security, JohnW. Rittinghouse, James F.Ransome, CRC Press, rp2012.
4. C lo ud A pp lication A rc hitectures: Bu ilding A pp lication s an dInfrastructure in the Cloud, George Reese, O'Reilly, SPD, rp2011.
5. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly,SPD, rp2011
6. Distributed and Cloud Computing, Kai Hwang, Geoffery C.Fox, JackJ.Dongarra, Elsevier, 2012.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C 3/0/0/3**

MOBILE ADHOC NETWORKS (C56PE4C)

Course Objective:

Analyze the various design issues and challenges in the layered architecture of Ad hoc wireless networks

Course Outcomes:

Upon completion of the course, the student will

1. Analyze the applications of Mobile Adhoc Networks –L4
2. Illustrate addressing the design issues of MAC protocols –L3
3. Prepare insights on the challenges of transmission control protocols and its performance overother protocols.-L3
4. Apply different protocols to develop energy management system- L3
5. Create optimize and integrate cross layer design issues –L5.

UNIT I

Introduction: Fundamentals of Wireless Networks, Wireless Internet, What Are Ad Hoc Networks?

MAC Layer Protocols: Important Issues and Need for Medium Access, Classification of MAC Protocols

UNIT II

Routing Protocols: Design Issues of Routing Protocols for Ad Hoc, Classification of Routing Protocols, Proactive Routing Protocols, Hybrid Routing Protocols.

Multi cast Routing Protocols: Issues in Design of Multicast Routing Protocols, Classification of Multicast Routing Protocols, QoS Routing, Energy-Efficient Multicast Routing Protocols, Location-Based Multicast Routing Protocols

UNIT III

Transport Protocols: TCP's Challenges and Design Issues in Ad Hoc Networks, TCP Performance over MANETs, Ad Hoc Transport Protocols,

Quality of Service: Challenges, Classification of QoS Solutions, QoS-Enabled Ad Hoc on-Demand Distance Vector Routing Protocol, QoS Frameworks for Ad Hoc Wireless Networks, INSIGNIA, INORA

UNIT IV

Energy Management Systems: Introduction, Energy-Efficient Routing Protocol, Transmission Power-Management Schemes, Transmission Power Control, AODV Protocol, Local Energy-Aware Routing Based on AODV, Power-Aware Routing Based on AODV, Lifetime Prediction Routing Based on AODV

UNIT V

Cross-Layer Design Issues: A Definition of Cross-Layer Design, Cross-Layer Design Principle, Proposals Involving Cross-Layer Design, Proposals for Implementing Cross-Layer Interactions, Cross-**Layer Design:** Is It Worth Applying It?, Pitfalls of the Cross-Layer Design Approach, Performance

Objectives.

Applications and Recent Developments: Typical Applications, Applications and Opportunities, Challenges, Most Recent Developments in the Field.

Text Books:

1. Ad hoc Mobile Wireless Networks principles, Protocols, and Applications 2ed, Subir Kumar, T.G. Basavaraj, C.Puttamaddappa CRC publications

Reference Books:

1 C.Siva Ram Murthy and B. S. Manoj, Ad hoc Wireless Networks Architecture and Protocols, 2nd edition, Pearson Edition, 2007.
2 Charles E. Perkins, Ad hoc Networking, Addison – Wesley, 2000.
3 Stefano Basagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, Mobile ad-hoc networking, Wiley-IEEE press, 2004.
4 Mohammad Ilyas, The handbook of ad-hoc wireless networks, CRC press, 2002.
5 T. Camp, J. Boleng, and V. Davies ― A Survey of Mobility Models for Ad-hoc Network‖
6 Research, –Wireless Communication, and Mobile comp. Special Issue on Mobile Ad-hoc Networking Research, Trends and Applications, Vol. 2, no. 5, 2002, pp. – 502.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C 3/0/0/3**

NETWORK SECURITY (C56PE4D)

Course Objective:

Understand the practical survey of network security applications and standards; emphasis is on applications that are widely used on the Internet and for corporate networks, and on standards (especially Internet standards) that have been widely deployed.

Course Outcomes:

Upon completion of course, the student will be able to

1. Apply security mechanisms across transport layer –L3
2. Understand and learn the security mechanism involved across a wireless network –L2
3. Understand about types of intruders and respective detection mechanism, malicious software, and viruses.-L2
4. Illustrate the need and significance of firewall and its types -L3.
5. Understand and gain knowledge on basic concepts of Network Management System, legal and ethicalaspects of establishing a network.-L2

UNIT I

Transport-Level Security

Web Security Considerations, Secure Socket Layer and Transport Layer Security, Transport Layer Security, HTTPS, Secure Shell (SSH).

UNIT II

Wireless Network Security: IEEE 80.11 Wireless LAN Overview, IEEE 80.11i Wireless LAN Security, Wireless Application Protocol Overview, Wireless Transport Layer Security, WAP End-to-End Security.

UNIT III

Intruders: Introduction, Intrusion Detection, Password, the Base-Rate Fallacy Malicious Software Types of Malicious Software, Viruses, Viru Countermeasures, Worms, Distributed Denial of Service Attacks

UNIT IV

Firewalls

The Need for Firewalls, Firewall Characteristics, Types of Firewalls, Firewall Basing, Firewall Location and Configurations.

UNIT V

Network Management Security

Basic Concepts of SNMP, SNMPv1 Community Facility, SNMPv3 Legal and Ethical Aspects Cybercrime and Computer Crime, Intellectual Property, Privacy, Ethical Issues.

Text Book:

1. Network Security Essentials by William Stallings, Fourth Edition-Pearson Education.

Reference Books:

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley,206
2. Applied Cryptography by Bruce Schneir-John Willey &Sons.
3. Corporate Computer and Network Security by Raymond panko-PearsonEducation.
4. Security in Computing by Charles P Pfleeger-O'ReilleyPublications.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C 3/0/0/3**

DESIGN PATTERNS (C56PE4E)

Course Objectives:

Understand the idea behind Design Patterns in handling common problems faced during building an application.

Course Outcomes:

Upon completion of course, the student will be able to

1. Understand scalable and easily maintainable software designs. -L2
2. Design an interface for documenting the built software modules. –L5
3. Compare and contrast decompose the structure of a designed software into classes and objects –L3
4. Identify communication among the objects occurs-L2.
5. Create a behavioral pattern for an organization.-L5

UNIT I

Introduction: What is a design pattern? design patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern**.**

UNIT II

Designing a Document Editor:

Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation**.**

UNIT III

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns**.**

UNIT IV
Structural Pattern: Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

UNIT V
Behavioral Patterns: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor**.**

Text Book:

1. Design Patterns, Erich Gamma, Pearson Education

Reference Books:

1. Pattern‘s in Java, Vol –I, Mark Grand, Wiley Dream Tech.
2. Patterns in Java, Vol-II, Mark Grand, Wiley Dream Tech.
3. Java Enterprise Design Patterns Vol-III, Mark Grand, Wiley Dream Tech.
4. Head First Design Patterns, Eric Freeman, O‘reily publications.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech. VI Semester **L/T/P/C 3/0/0/3**

DEEP LEARNING (C56PE4F)

Course Objective:

Understand present the mathematical, statistical and computational challenges of building stable representations for high-dimensional data, such as images, text and data.

Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concepts of deep feed forward networks, regularization for Deep Learning taxonomy-L2
2. Apply the knowledge to optimize training deep models, understand themotivation, and mechanism to build convolutional networks.- L3
3. Develop sequence modelling using the knowledge of recurrent and recursive networks.-L5
4. Analyze various auto encoders, gain overview of representation learning –L4
5. Apply different structured probabilistic models for deep learning.- L3

UNIT I

Deep Feedforward Networks

Challenges Motivating Deep Learning, Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back-Propagation and Other Differentiation Algorithms.

Regularization for Deep Learning

Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised Learning, Multi-Task Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging and Other Ensemble Methods, Dropout, Adversarial Training Tangent Distance, Tangent Prop, and Manifold Tangent Classifier.

UNIT II

Optimization for Training Deep Models

How Learning Differs from Pure Optimization, Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates, Approximate Second-Order Methods, Optimization Strategies and Meta-Algorithms.

Convolutional Networks

The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, The Neuro scientific Basis for Convolutional Networks.

UNIT III

Sequence Modeling: Recurrent and Recursive Nets

Unfolding Computational Graphs, Recurrent Neural Networks and Bidirectional RNN, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, The Challenge of Long-Term Dependencies, Echo State Networks, Leaky Units and Other Strategies for Multiple Time Scales, The Long Short-Term Memory and Other Gated RNNs,

Optimization for Long-Term Dependencies, Explicit Memory,

Applications

Large-Scale Deep Learning, Computer Vision, Speech Recognition, Natural Language Processing, Other Applications

UNIT IV

Autoencoders

Undercomplete Autoencoders, Regularized Autoencoders, Representational Power, Layer Size and Depth, Stochastic Encoders and Decoders, Denoising Autoencoders, Learning Manifolds with Autoencoders, Contractive Autoencoders, Predictive Sparse Decomposition, Applications of Autoencoders.

Representation Learning

Greedy Layer-Wise Unsupervised Pretraining, Transfer Learning and Domain Adaptation, Semi-Supervised Disentangling of Causal Factors, Distributed Representation, Exponential Gains from Depth, Providing Clues to Discover Underlying Causes.

UNIT V

Structured Probabilistic Models for Deep Learning

The Challenge of Unstructured Modeling, Using Graphs to Describe Model Structure, Sampling from Graphical Models, Advantages of Structured Modeling, Learning about Dependencies, Inference and Approximate Inference, The Deep Learning Approach to Structured Probabilistic Models.

Text Books:

1. Deep Learning, Ian Good Fellow, Yoshua Bengio and Aaron Courville.

Reference Books:

1. Neural Networks and Learning Machines, Simon Haykin, Third Edition, Pearson.
2. Michael Nielsen, ‐Neural Networks and Deep Learning‖, Determination Press, 2015. http://neuralnetworksanddeeplearning.com/
3. CharuC.Aggarwal ‐Neural Networks and Deep learning‖ Springer International Publishing, 2018
4. Satish Kumar, ‐Neural Networks, A Classroom Approach‖, Tata McGraw -Hill, 2007.
5. Simon Haykin, ―Neural Networks, A Comprehensive Foundation‖, 2nd Edition, Addison Wesley Longman, 2001.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING

B.Tech.VI Semester **L/T/P/C 0/0/2/1**

DATA WAREHOUSING AND DATA MINING LAB (C56PC5)

Course Objective:

Ability to understand the various kinds of tools, demonstrate the classification, clusters and etc. inlarge data sets.

Course Outcomes:

Upon completion of course, the student will be able to

1. Build a data warehouse and query it (using open source tools like PentahoData Integration and Pentaho Business Analytics)-L4
2. Understand data mining tasks using a data mining toolkit (such as open-sourceWEKA)-L2
3. Understand the data sets and data preprocessing-L2
4. Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering, and regression-L4
5. Practice the data mining techniques with varied input values for different parameters.- L4

TASK I:

Build Data Warehouse and Explore WEKA

Build a Data Warehouse/Data Mart (using open source tools like Pentaho Data Integration tool, Pentoaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects etc.).

1. Identify source tables and populate sample data
2. Design multi-dimensional data models namely Star, snowflake and Fact constellation schemas for anyone enterprise (ex. Banking, Insurance, Finance, Healthcare, Manufacturing, Automobile, etc.).
3. Write ETL scripts and implement using data warehouse tools
4. Perform various OLAP operations such as slice, dice, roll up, drill up and pivot
5. Explore visualization features of the tool for analysis like identifying trends etc.

B. Explore WEKA Data Mining/Machine Learning Toolkit

1. Downloading and/or installation of WEKA data mining toolkit,
2. Understand the features of WEKA toolkit such as Explorer, Knowledge Flow interface, Experimenter, command-line interface.
3. Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, Classify panel, Cluster panel, Associate panel and Visualize panel) Study the arff file format

4. Explore the available data sets in WEKA.
5. Load a data set (ex. Weather dataset, Iris dataset,etc.)
6. Load each dataset and observe the following:
    i. List the attribute names and their types
    ii. Number of records in each dataset
    iii. Identify the class attribute (if any)
    iv. Plot Histogram
    v. Determine the number of records for each class.
    vi. Visualize the data in various dimensions

TASK II:

Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets

1. Explore various options available in Weka for preprocessing data and apply (like Discretization Filters, Resample filter, etc.) on each dataset
2. Load each dataset into Weka and run Apriori algorithm with different support and confidence values. Study the rules generated.
3. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.

TASK III:

Demonstrate performing classification on data sets

1. Load each dataset into Weka and run Id3, J48 classification algorithm. Study the classifier output. Compute entropy values, Kapp a statistic.
2. Extract if-then rules from the decision tree generated by the classifier, Observe the confusion matrix and derive Accuracy, F-measure, TPrate, FPrate, Precision and Recall values. Apply a cross-validation strategy with various fold levels and compare the accuracy results.
3. Load each dataset into Weka and perform Naïve-Bayes classification and k-Nearest Neighbour classification. Interpret the results obtained.
4. Plot RoC Curves
5. Compare classification results of ID3, J48, Naïve-Bayes and k-NN classifiers for each dataset, and deduce which classifier is performing best and poor for each dataset and justify.

TASK IV:

Demonstrate performing clustering on data sets

1. Load each dataset into Weka and run a simple k-means clustering algorithm with different values of k (number of desired clusters). Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights.
2. Explore other clustering techniques available in Weka.
3. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explanations.

TASK V:

Demonstrate performing Regression on datasets

1. Load each dataset into Weka and build a Linear Regression model. Study the clusters formed. Use the Training set option. Interpret the regression model and derive patterns and conclusions from the regression results.
2. Use options cross-validation and percentage split and repeat running the Linear Regression Model. Observe the results and derive meaningful results.
3. Explore a Simple linear regression technique that only looks at one variable.

Resource Sites:

1. http://www.pentaho.com/
2. http://www.cs.waikato.ac.nz/ml/weka/

TASK VI:

Credit Risk Assessment Description:

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank‘s business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank‘s loan policy must involve a compromise: not too strict, and not too lenient. To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. Credit dataset (original) Excel spreadsheet version of the German credit data. In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer!)

A few notes on the German Dataset

1. DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
2. owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
3. foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents. • There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.

Subtasks: (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.

2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.

3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify

correctly? (This is also called testing on the training set) Why do you think you cannot get 100% training accuracy?

5. Is testing on the training set as you did above a good idea? Why or Why not ?

6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what is cross-validation briefly. Train a Decision Tree again using cross- validation and report your results. Does your accuracy increase/decrease? Why?

7. Check to see if the data shows a bias against ―foreign workers‖ (attribute 20), or ―personal-status‖ (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka‘s GUI Explorer. Did removing these attributes have any significant effect? Discuss.

8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)

9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

12. (Extra Credit): How can you convert a Decision Trees into ―if-thenelse rules‖. Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules. PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one Can you predict what attribute that might be in this dataset ? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and one R.

Task Resources:

Mentor lecture on Decision Trees

Andrew Moore‘s Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

Decision Trees (Source: Tan, MSU)
Tom Mitchell‘s book slides (See slides on Concept Learning and Decision Trees)

Weka resources:
Introduction to Weka (html version) (download ppt version) Download Weka Weka Tutorial ARFF format
Using Weka from command line

TASK VII:
Hospital Management System
Data Warehouse consists Dimension Table and Fact Table. REMEMBER The following Dimension The dimension object (Dimension):
_ Name_Attributes (Levels), with one primary key
_Hierarchies
One time dimension is must. About Levels and Hierarchies
Dimension objects (dimension) consist of a set of levels and a set of hierarchies defined over those levels. The levels represent levels of aggregation. Hierarchies describe parent-child relationships among a set of levels. For example, a typical calendar dimension could contain five levels. Two hierarchies can be defined on these levels:
H1: YearL > QuarterL > MonthL > WeekL > DayL H2: YearL > WeekL > DayL
The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth. About Unique Key Constraints When you create a definition for a hierarchy, Warehouse Builder creates an identifier key for each level of the hierarchy and a unique key constraint on the lowest level (Base Level) Design a Hospital Management system data warehouse (TARGET) consists of Dimensions Patient, Medicine, Supplier, Time. Where measures are _NO UNITS‘, UNIT PRICE. Assume the Relational database (SOURCE) table schemas as follows
TIME (day, month, year),
PATIENT (patient_name, Age, Address, etc.,)
MEDICINE (Medicine_Brand_name, Drug_name, Supplier, no_units,Uinit_Price,etc.,) SUPPLIER: (Supplier_name, Medicine_Brand_name, Address, etc.,) If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably. Design the Hospital Management system data warehouse using all schemas. Give the example 4-D cube with assumption names.

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)

COMPUTER SCIENCE & ENGINEERING
B.Tech.VI Semester

L /T/P/C
0/0/2/1

WEB TECHNOLOGIES LAB (C56PC6)

Course Objective:

Understand the program web applications using the following technologies HTML,Javascript, AJAX, PHP, Tomcat Server, Servlets, JSP.

Course Outcomes:

After completion of this course, the student will be able to

1. Solve LAMP Stack for web applications –L3
2. Develop servlets and JSPs applications using tomcat server –L5
3. Practice simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets,and JSPs, Parse XML files using Java (DOM and SAX parsers)-L3
4. Create to Database and get results.-L5

List of Experiments:

1. Write an HTML page including JavaScript that takes a given set of integer numbers andshows them after sorting in descendingorder.
2. Write an HTML page including any required Javascript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show ―out of range‖ and if it is not a number, it should show ―not a number‖ message in the result box.
3. Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters, words and lines in the text entered using an alert message. Words are separated with white space and lines are separated with new line character.
4. Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).
5. Create an XML document that contains 10 users information. Write a Java program, which takes User Id as input and returns the user details by taking the user information from the XML document using (a) DOM Parser and (b) SAX parser Implementthe following web applications using (a) PHP, (b) Servlets and (c)JSP:
6. A user validation web application, where the user submits the login name and password tothe server. The name and password are checked against the data already available inDatabase and if the data matches, a successful login page is returned. Otherwise a failure message is shown to the user.
7. Modify the 6th program to use an xml file instead of database.

8. Modify the 6th program to use AJAX to show the result on the same page below the submitbutton.
9. A simple calculator web application that takes two numbers and an operator (+, -, /, * and
   %) from an HTML page and returns the result page with the operation performed on theoperands.
10. Modify the above program such that it stores each query in a database and checks the database first for the result. If the query is already available in the DB, it returns the valuethat was previously computed (from DB) or it computes the result and returns it after storingthe new query and result in DB.
11. A web application takes a name as input and on submit it shows a hello page where is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You message with the duration of usage (hint: Use session to store name and time).
12. A web application that takes name and age from an HTML page. If the age is less than
    it should send a page with ―Hello , you are not authorized to visit this site‖ message, where should be replaced with the entered name. Otherwise it should send ―Welcome to this site‖ message.
13. A web application for implementation: The user is first served a login page which takesuser‘s name and password. After submitting the details the server checks these values against the data from a database and takes the following decisions. If name and passwordmatches, serves a welcome page with user‘s full name. If name matches and passworddoesn‘t match, then serves ―password mismatch‖ page If name is not found in the database, serves a registration page, where user‘s full name is asked and on submitting the full name,it stores, the login name, password and full name in the database (hint: use session forstoring the submitted login name and password)
14. A web application that lists all cookies stored in the browser on clicking ―List Cookies‖ button. Add cookies if necessary.