CRYPTOGRAPHY AND NETWORK SECURITY

UNIT-I

UNIT-II
Secret Key Cryptography: Data Encryption Standard(DES), Strength of DES, Block Cipher Design Principles and Modes of Operations, Triple DES, International Data Encryption algorithm, Blowfish, CAST-128,AES

UNIT-III
Number Theory: Prime and Relatively Prime Numbers, Modular Arithmetic, Fermat’s and Euler’s Theorems, the Chinese Remainder Theorem, Discrete Logarithms.

UNIT-IV

UNIT-V

UNIT-VI

UNIT-VII

UNIT-VIII

TEXT BOOKS:

REFERENCE BOOKS:
3. Introduction to Cryptography, Buchmann, Springer.
UNIT-I

UNIT-II

UNIT-III
Cnational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-IV
Structural Pattern Part-I: Adapter, Bridge, Composite.

UNIT-V
Structural Pattern Part-IP. Decorator, acade. Flyweight, Proxy.

UNIT-VI
Behavioral Patterns Part-I: Chain of Responsibility, Command, Interpreter, Iterator.

UNIT-VII
Behavioral Patterns Part-II: Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns.

UNIT-VIII
What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXTBOOK:
1. Design Patterns By Erich Gamma, Pearson Education

REFERENCE BOOKS:
4. Head First Design Patterns By Eric Freeman- Oreilly- spd
5. Design Patterns Explained By Alan Shalloway. Pearson Education.
DATA WAREHOUSING AND DATAMINING

UNIT-I:
Introduction to Data Mining: What is data mining, motivating challenges, origins of data mining, data mining tasks. Types of Data-attributes and measurements, types of data sets. Data Quality (Tan)

UNIT-II:
Data preprocessing, Measures of Similarity and Dissimilarity: Basics, similarity and dissimilarity between simple attributes, dissimilarities between data objects, similarities between data objects, examples of proximity measures: similarity measures for binary data, Jaccard coefficient. Cosine similarity. Extended Jaccard coefficient, Correlation, Exploring Data: Data Set, Summary Statistics (Tan)

UNIT -III:
Data Warehouse: basic concepts. Data Warehousing Modeling: Data Cube and OEAP, Data Warehouse implementation: efficient data cube computation, partial materialization, indexing OLAP data, efficient processing of OLAP queries. (II &C)

UNIT -IV:
Classification: Basic Concepts, General approach to solving a classification problem, Decision Tree induction: working of decision tree, building a decision tree, methods for expressing attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction. Model over fitting: Due to presence of noise, due to lack of representation samples, evaluating the performance of classifier: holdout method, random sub sampling, cross-validation, bootstrap. (Tan)

UNIT -V:
Classification-Alternative techniques: Bayesian Classifier: Bayes theorem, using bayes theorem for classification, Naive Bayes classifier, Bayes error rate, Bayesian Belief Networks: Model representation, model building (Tan)

UNIT -VI:
Association Analysis: Problem Definition, Frequent Item-set generation- The Apriori principle, Frequent Item set generation in the Apriori algorithm, candidate generation and pruning, support counting (eluding support counting using a Hash tree), Rule generation, compact representation of frequent item sets, FP-Growth Algorithms. (Tan)

UNIT -VII:
Overview- types of clustering, Basic K-means, K. means additional issues. Bisecting k-means, k-means and different types of clusters, strengths and weaknesses, k-means as an optimization problem.

UNIT -VIII:
Agglomerative Hierarchical clustering, basic agglomerative hierarchical clustering algorithm, specific techniques, DBSCAN: Traditional density: center-based approach, strengths and weaknesses ('Tan)

TEXTBOOKS:
1. Introduction to Data Mining : Pang- Ning tan, Michael Steinbach, Vipin Kumar, Pearson
2. Data Mining,Concepts and Techniques, 3/e, Jiawei Han , Michcline Kamber, Elsevier

REFERENCE BOOKS:
1. Introduction to Data Mining with Case Studies 2
ed: GK Gupta; PHI.
3. Data Warehousing, Data Mining & OLAP, Alex Berson, Stephen J Smith, TMH
MOBILE COMPUTING

UNIT-I:

UNIT-II:
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-III:
GSM and other 2G Architectures: GSM - services and system architecture, Radio interfaces of GSM, Protocols of GSM, Localization, Call handling, GPRS system architecture.

UNIT-IV:

UNIT-V:
Mobile IP Network layer: IP ant! Mobile IP network layers: OSI layer functions, TCP/IP and Internet protocol. Mobile internet protocol; Packet delivery and Handover Management; Location Management: Agent Discovery; Mobile TXT

UNIT-VI:
Synchronization: Synchronization in mobile computing systems, Usage models for Synchronization in mobile application. Domain- dependant specific rules for data synchronization. Personal information manager, synchronization and conflict resolution strategies, synchronizer; Mobile agent: mobile agent design, aglets: Application Server.

UNIT-VII:
Introduction to Mobile Adhoc network: fixed infrastructure architecture. MANET infrastructure architecture; MANET: properties, spectrum, applications; Security in Ad-hoc network; Wireless sensor networks; sensor network applications.

UNIT-VIII:

TEXTBOOKS:

REFERENCE BOOKS:
INFORMATION RETRIEVAL SYSTEMS

UNIT-I:
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

UNIT-II:
Information Retrieval System Capabilities: Search, Browse, Miscellaneous

UNIT-III:
PAT data structure. Signature file structure. Hypertext data structure.

UNIT-IV:
Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

UNIT-V:

UNIT-VI:
User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search. Weighted searches of Boolean systems, Searching the Internet and hypertext.

UNIT-VII:
Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-VIII:
Text Search Algorithms: Introduction. Software text search algorithms, Hardware text search systems.

TEXT BOOKS:

REFERENCE BOOKS:
2. Modern Information Retrieval By Yates Pearson Education.
PARALLEL COMPUTING

UNIT-I:

UNIT-II:

UNIT-III:
Algorithms-1: Elementary Parallel algorithms on SIMD and MIMD machines, Analysis of these algorithms. Matrix Multiplication algorithms on SIMD and MIMD models.

UNIT-IV:

UNIT-V:
Array processors: Array processors, 2D-Mesh processor and Hypercube Processor Array.

UNIT-VI:
Sorting: Parallel sorting methods. Odd-even transposition Sorting on processor arrays, Parallel Quick-sort on Multi-processors. Hyper Quick sort on hypercube multi computers, merge sort on shuffle-exchange ID.

UNIT-VII:
Searching-1: Parallel search operations. Ellis algorithm and Manber and ladner's Algorithms for dictionary operations.

UNIT-VIII:
Searching-2: Parallel algorithms for Graph searching, All Pairs shortest paths and minimum cost spanning tree.

TEXT BOOKS:
1. Parallel Computing Theory and Practice, Michel J. Quinn
DISTRIBUTED SYSTEMS

UNIT-I:

UNIT-II:

UNIT-III:
Interprocess Communication: Introduction, The API for the Internet Protocols- The Characteristics of Interprocess communication, Sockets, UDP Datagram Communication, TCP Stream Communication; External Data Representation and Marshalling; Client Server-Communication; Group Communication- IP Multicast- an implementation of group communication, Reliability and Ordering of Multicast.

UNIT-IV:
Distributed Objects and Remote Invocation: Introduction. Communication between Distributed Objects- Object Model, Distributed Object Modal, Design Issues for RMI. Implementation of RMI, Distributed Garbage Collection; Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI

UNIT-V:

UNIT-VI:

UNIT-VII:
Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication.

UNIT-VIII:
Transactions & Replications: Introduction, System Model and Group Communication, Concurrency Control in Distributed Transactions. Distributed Dead Locks, Transaction Recovery; Replication-Introduction, Passive (Primary) Replication, Active Replication.

TEXTBOOKS:
ARTIFICIAL INTELLIGENCE

UNIT-I:
Introduction to artificial intelligence: Introduction , history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of ai languages, current trends in AI

UNIT-II:
Problem solving: state-space search and control strategies: Introduction, general problem solving, characteristics of problem, exhaustive searches, heuristic search techniques, iterative-deepening a*, constraint satisfaction
Problem reduction and game playing: Introduction, problem reduction, game-playing, alpha-beta pruning, two-player perfect information games

UNIT-III:
Logic concepts: Introduction, propositional calculus, proportional logic, natural deduction system, axiomatic system, semantic tableau system in proportional logic, resolution refutation in proportional logic, predicate logic.

UNIT-IV:
Knowledge representation: Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames advanced knowledge representation techniques: Introduction, conceptual dependency theory, script structure, eye theory, case grammars, semantic web

UNIT-V:
Expert system and applications: Introduction phases in building expert systems, expert system versus traditional systems, rule-based expert systems blackboard systems truth maintenance systems, application of expert systems, list of shells and tools

UNIT-VI:
Uncertainty measure: probability theory: Introduction, probability theory, Bayesian belief networks, certainty factor theory, dempster- shafer theory
Fuzzy sets and fuzzy logic: Introduction, fuzzy sets, fuzzy set operations, types of membership functions, multi valued logic, fuzzy logic, linguistic variables and hedges, fuzzy propositions, inference rules for fuzzy propositions, fuzzy systems.

UNIT-VII:
machine learning paradigms: Introduction, machine learning systems, supervised and unsupervised learnings, inductive learning, deductive learning, clustering, support vector machines, case based reasoning and learning

UNIT-VIII:
Artificial neural networks: Introduction, artificial networks, single layer feed forward networks, multi layered forward networks, design issues of artificial neural networks

TEXTBOOKS:
1. Artificial Intelligence- Saroj Kaushik, CENGAGE Learning,
2. Artificial Intelligence, A modern Approach, 2"ed, Stuart Russel, Peter Norvig, PEA
3. Artificial Intelligence- Rich, Kevin Knight. Shiv Shankar B Nair, 3"ed, TMH
4. Introduction Artificial Intelligence, Patterson, PHI.

REFERENCE BOOKS:
1. Artificial Intelligence, structures and Strategies for Complex problem solving, -George Flugar, 5" ed, PEA
2. Introduction to Artificial Intelligence, Ertel, Wolf Gang, Springer
COMPUTER ARCHITECTURE

UNIT-I:

UNIT-II:
Memory Hierarchy Design: Introduction- Basic Memory Hierarchy, Optimization of Cache Performance- Small and Simple First-Level Caches to Reduce Hit Time and Power, Way Prediction to Reduce Hit Time, Pipelined Cache Access to Increase Cache Bandwidth, Non blocking Caches to Increase Cache Bandwidth; Virtual Memory and Virtual Machines- Protection Via Virtual Memory, Protection via Virtual Machines.

UNIT-III:

UNIT-IV:
Linear and Nonlinear Pipeline Processors: Asynchronous and Synchronous models, Clocking and Timing control, Speedup, Efficiency and Throughput; Nonlinear pipeline processors: Reservation and Latency analysis-Problems, Collision Free Scheduling-problems, Instruction Execution Phases.

UNIT-V:

UNIT-VI:

UNIT-VII:
VSIMD and MIMD Computer Organizations- Implementation models, The CM-2 Architecture; A Synchronized MIMD Machine, Control Processors and Processing Nodes, Interprocessor Communications.

UNIT-VIII:

TEXTBOOKS:

REFERENCE BOOKS:
1. Computer Architecture, Concepts and Evolutions, Garrit A Blaauw, PEA
WEB SERVICES

UNIT-I:
Evolution and Emergence of Web Services - Evolution of distributed computing, Core distributed computing technologies - client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

UNIT-II:
Introduction to Web Services - The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

UNIT-III:
Web Services Architecture - Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services, developing web services enabled applications.

UNIT-IV:
Describing Web Services - WSDL - WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

UNIT-V:
Core fundamentals of SOAP - SOAP Message Structure, SOAP encoding, SOAP message exchange models, SOAP communication and messaging, SOAP security.
Developing Web Services using SOAP - Building SOAP Web Services, developing SOAP Web Services using Java, limitations of SOAP.

UNIT-VI:
Discovering Web Services - Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI - UDDI Registries, uses of UDDI Registry, Programming with UDDI. UDDI data structures, support for categorization in UDDI Registries, Publishing API, Publishing information to a UDDI Registry, searching information in a UDDI Registry, deleting information in a UDDI Registry, limitations of UDDI.

UNIT-VII:
Web Services Interoperability - Means of ensuring Interoperability. Overview of .NET and J2EE.

UNIT-VIII:

TEXTBOOKS:
1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
2. Java Web Services Architectures, Mc Goven, Tyagi, Stevens, Mathew, Elsevier
3. XML, Web Services, and the Data Revolution, F.P.Coylc, Pearson Education.

REFERENCE BOOKS:
2. Java Web Services, D.A. Chappell &T. Jewell, O'Reilly, SPD.
OPEN SOURCE SOFTWARE

UNIT-I:
INTRODUCTION: Introduction to Open sources - Need of Open Sources Advantages of Open Sources Application of Open Sources. Open source operating systems: LINUX: Introduction -- General Overview Kernel Mode and user mode

UNIT-II:

UNIT-III:

UNIT-IV:
OPEN SOURCE PROGRAMMING LANGUAGES: PUP: Introduction Programming in web environment - variables - constants data types -operators Statements - Functions Arrays OOP Using Manipulation and regular expression File handling and data storage

UNIT-V:
PHP and SQL database -PHP and LDAP - PHP Connectivity Sending and receiving E-mails - Debugging and error handling - Security - Templates.

UNIT-VI:
PYTHON : Syntax and Style - Python Objects - Numbers - Sequences -Strings - Lists and Tuples - Dictionaries - Conditionals and Loops

UNIT-VII:
Files - Input and Output - Errors and Exceptions - Functions - Modules - Classes and OOP - Execution Environment.

UNIT-VIII:
PERL: Perl backgrounder - Perl overview - Perl parsing rules Variables and Data Statements and Control structures Subroutines. Packages, and Modules- Working with Files - Data Manipulation.

TEXTBOOKS:

REFERENCES:
UNIT-I:
The IT Act, 2000: A Critique: Crimes in this Millennium, Section 80 of the IT Act, 2000 - A Weapon or a Farce?, Forgetting the Line between Cognizable and Non- Cognizable Officers, Arrest for "About to Commit" an Offence Under the IT Act, A Tribute to Darco, Arrest, But No Punishment.

UNIT-II:
Cyber Crime and Criminal Justice: Penalties, Adjudication and Appeals Under the IT Act, 2000: Concept of Cyber Crime and the IT Act, 2000, Hacking, Teenage Web Vandals, Cyber fraud and Cyber Cheating, Virus on Internet Deformation, Harassment and E-mail Abuse

UNIT-III:

UNIT-IV:

UNIT-V:

UNIT-VI:
Web Based Criminal Activity. Interference with Lawful Use of Computers, Mai ware, DoS (Denial of Service) and DDoS (Distributed Denial of Service) Attacks, Spam, Ransomware and Kidnapping of Information, Theft of Information, Data Manipulation, and Web Encroachment, Dissemination of Contraband or Offensive materials, Online Gambling Online Fraud. Securities Fraud and stock Manipulation, Ancillary crimes

UNIT-VII:
IDENTITY THEFT AND IDENTITY FRAUD: Typologies of Internet Theft/Fraud, Prevalence and Victimology, Physical Methods of Identity Theft, Virtual and Internet Facilitated methods, Crimes facilitated by Identity theft/fraud, Organized Crime and Technology

UNIT-VIII:
Protection of Cyber consumers in India Cyber consumer act Consumer, (roads and service, consumer compliant, restricted and unfair trade practices

TEXTBOOKS:
3. Cyber Laws Texts and Cases, Ferrera, CENGAGE
UML & Design Patterns Lab

1. To create a UML diagram of ATM APPLICATION.
2. To create a UML diagram of LIBRARY MANAGEMENT SYSTEM.
3. To create a UML diagram of ONLINE BOOK SHOP
4. To create a UML diagram of RAILWAY RESERVATION SYSTEM
5. To create a UML diagram for BANKING SYSTEM
6. To design a Document Editor
7. Using UML, design Abstract factory design pattern
8. Using UML design Builder Design pattern
9. Using UML design Facade Design pattern
10. Using UML, design Bridge Design pattern
11. Using UML design Decorator Design pattern
12. User gives a print command from a word document. Design to represent this chain of responsibility design pattern
MOBILE APPLICATION DEVELOPMENT LAB

1. Write a J2MH program to show how to change the font size and colour.

2. Write a J2ME program which creates the following kind of menu.
   * cut
   * copy
   * past
   * delete
   * select all
   * unselect all

3. Create a J2ME menu which has the following options (Event Handling):
   cut - can be on/off
   copy - can be on/off
   paste - can be on/off
   delete - can be on/off
   select all - put all 4 options on
   unselect all - put all

4. Create a MIOP application, which draws a bar graph to the display. Data values can be given at int [] array. You can enter four data (integer) values to the input text field.

5. Create an MIDP application which examine, that a phone number, which a user has entered is in the given format (Input checking):
   * Area code should be one of the following: 040,041,050,0400,044
   * There should be 6-8 numbers in telephone number (+ area code)

6. Write a sample program to show how to make a SOCKET Connection from J2ME phone. This J2ME sample program shows how to make a SOCKET Connection from a J2ME Phone. Many a times there is a need to connect backend HTTP server from the J2ME application. Show how to make a SOCKET connection from the phone to port 80.

7. Login to I OTP Server from a J2ME Program. This J2ME sample program shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server. Many J2ME applications for security reasons require the authentication of the user. This free J2ME sample program, shows how a J2ME application can do authentication to the backend server. Note: Use Apache Tomcat Server as Web Server and MySQL as Database Server.

8. The following should be carried out with respect to the given set of application domains:
   (Assume that the Server is connected to the well-maintained database of the given domain.
   Mobile Client is to be connected to the Server and fetch the required data value/information)
   • Students Marks Enquiry
   • Town/City Movie Enquiry
   • Railway/Road/Air (For example PNR) Enquiry/Status
   • Sports (say, Cricket) Update
   • Town/City Weather Update
   • Public Exams (say Intermediate or SSC) Entrance (Say EAMCET) Results Enquiry
   Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.
9. Write an Android application program that displays Hello World using Terminal.

10. Write an Android application program that displays Hello World using Eclipse.

11. Write an Android application program that accepts a name from the user and displays the hello name to the user in response as output using Eclipse.

12. Write an Android application program that demonstrates the following:
    (i) Linear Layout  
    (ii) Relative Layout  
    (iii) Table Layout  
    (iv) Grid View layout

13. Write an Android application program that converts the temperature in Celsius to Fahrenheit.

14. Write an Android application program that demonstrates intent in mobile application development.