

IV YEAR

ISEMESTER

S. No.	Subject	T	P	Credits
1	Cryptography and Network Security	4	-	4
2	Design Patterns	4	-	4
3	Data Ware Housing and Data Mining	4	-	4
4	Mobile Computing	4	-	4
5	Open Elective			
	i. MATLAB (except CSE, IT, ECE, EEE)			
	ii. Web Services (except CSE, IT)			
	iii. Open Source Software			
	iv. Cyber Laws	4	-	4
6	Elective -I:			
	i. Information Retrieval Systems			
	ii. Parallel Computing			
	iii. Distributed Systems			
	iv. Artificial Intelligence			
	v. Computer Architecture	4	-	4
7	UML & Design Patterns Lab	-	3	2
8	Mobile Application Development Lab	-	3	2
	Total			28

IV YEAR

II SEMESTER

S. No.	Subject	T	P	Credits
1	Elective -II			
	i) Human Computer Interaction			
	ii) Advanced Operating Systems			
	iii) Mobile Adhoc & Sensor Networks			
	iv) Pattern Recognition			
	v) Digital Image Processing	4	-	4
2	Elective -III			
	i) Embedded and Real time Systems			
	ii) Simulation and Modeling			
	iii) Computer Forensics			
	iv) Machine Learning			
	v) Multimedia & Application Development	4	-	4
3	Elective -IV			
	i) Software Testing Methodologies			
	ii) Neural Networks & Soft Computing			
	iii) Social Networks and the Semantic Web			
	iv) Cloud Computing			
	v) E- Commerce	4	-	4
4	Software Project Management	4	-	4
5	Project			12
	Total			28

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B.Tech. IT. II-Sem.

INTELLECTUAL PROPERTY RIGHTS AND PATENTS – II

UNIT I

Intellectual Property Law Basics – Types of Intellectual Property – Agencies responsible for Intellectual Property Registration - Cyber crime and E-commerce – International Aspects of Computer and Online Crime

UNIT II

Introduction to Patent Law – Rights and Limitations – Rights under Patent Law – Patent requirements - Ownership - Transfer - Patents Application Process – Patent Infringement - Patent Litigation - International Patent Law – Double Patenting – Patent Searching – Patent Law Treaty - New developments in Patent Law - Invention Developers and Promoters

UNIT III

Introduction to Transactional Law: Creating Wealth and Managing Risk – The Employment Relationship in the Internet and Tech Sector – Contact for the Internet and Tech Sector - Business Assets in Information Age – Symbol and Trademark – Trolls and Landmines and other Metaphors

Unit IV

Regulatory, Compliance and Liability Issues – State Privacy Law - Data Security – Privacy issues - Controlling Over use or Misuse of Intellectual Property Rights

BOOKS:

1. Deborah E. Bouchoux: "Intellectual Property". Cengage learning, New Delhi
2. Kompal Bansal & Parishit Bansal "Fundamentals of IPR for Engineers", BS Publications (Press)
3. Cyber Law. Texts & Cases, South-Western's Special Topics Collections
4. Prabhuddha Ganguli: "Intellectual Property Rights" Tata Mc-Graw – Hill, New Delhi
5. Richard Stim: "Intellectual Property", Cengage Learning, New Delhi.
6. R. Radha Krishnan, S. Balasubramanian: "Intellectual Property Rights", Excel Books, New Delhi.
7. M. Ashok Kumar and Mohd. Iqbal Ali: "Intellectual Property Right" Serials Pub.

Information Technology

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. I-Sem.

CRYPTOGRAPHY AND NETWORK SECURITY

UNIT-I:

Introduction: Security Attacks, Security Services, Security Mechanisms, and a Model for Network Security, Non-Cryptographic Protocol Vulnerabilities - DoS, DDoS, Session Hijacking and Spoofing, Software Vulnerabilities - Phishing, Buffer Overflow, Format String Attacks, SQL Injection, Basics of Cryptography - Symmetric Cipher Model, Substitution Techniques, Transportation Techniques, Other Cipher Properties - Confusion, Diffusion, Block and Stream Ciphers.

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:

Public Key Cryptography: Principles of Public Key Cryptosystems, RSA Algorithm, Diffie-Hellman Key Exchange, Introduction to Elliptic Curve Cryptography.

UNIT-V:

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Secure Hash Algorithm, Message Authentication Codes - Message Authentication Requirements and Functions, HMAC, Digital signatures, Digital Signature Schemes, Authentication Protocols, Digital Signature Standards.

UNIT-VI:

Authentication Applications: Kerberos, Key Management and Distribution, X.509 Directory Authentication service, Public Key Infrastructure, Electronic Mail Security: Pretty Good Privacy, S/MIME.



UNIT-VII:

IP Security: Overview, Architecture, Authentication Header, Encapsulating Security Payload, Combining security Associations, Internet Key Exchange, Web Security: Web Security Considerations, Secure Sockets Layer and Transport Layer Security, Electronic Payment.

UNIT-VIII:

System Security: Intruders, Intrusion Detection, Password Management, Malicious Software - Types, Viruses, Virus Countermeasures, Worms, Firewalls - Characteristics, Types of Firewalls, Placement of Firewalls, Firewall Configuration, Trusted systems.

TEXT BOOKS:

1. Cryptography and Network Security: Principles and Practice, 5th Edition, William Stallings, Pearson Education, 2011.
2. Network Security and Cryptography, Bernard Menezes, Cengage Learning, 2011.
3. Cryptography and Network, 2nd Edition, Behrouz A. Fourouzan and Debdeep Mukhopadhyay, McGraw-Hill, 2010.

REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Principles of Information Security, Whitman, Thomson.
3. Introduction to Cryptography, Buchmann, Springer.
4. Applied Cryptography, 2nd Edition, Bruce Schneier, Johnwiley & Sons.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. I-Sem.

DESIGN PATTERNS**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

A Case Study: 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, Summary.

UNIT-III

Creational 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-II: Decorator, façade, Flyweight, Proxy.

UNIT-VI

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

UNIT-VII

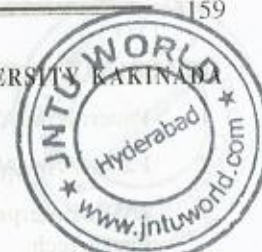
Behavioral Patterns Part-II: Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns.

UNIT-VIII

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

TEXT BOOK:

1. Design Patterns By Erich Gamma, Pearson Education



REFERENCE BOOKS:

1. Pattern's in JAVA Vol-I By Mark Grand ,Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand ,Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,Wiley DreamTech.
4. Head First Design Patterns By Eric Freeman-Oreilly-spd
5. Design Patterns Explained By Alan Shalloway,Pearson Education.



IV Year B.Tech. IT. I-Sem.

DATA WAREHOUSING AND DATA MINING**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 OLAP, Data Warehouse implementation : efficient data cube computation, partial materialization, indexing OLAP data, efficient processing of OLAP queries. (H & 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, Naïve 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)

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Introduction to Data Mining with Case Studies 2nd ed: GK Gupta; PHI.
2. Data Mining : Introductory and Advanced Topics : Dunham, Sridhar, Pearson.
3. Data Warehousing, Data Mining & OLAP, Alex Berson, Stephen J Smith, TMH
4. Data Mining Theory and Practice, Soman, Diwakar, Ajay, PHI, 2006.



UNIT-I:

Introduction: Mobile Communications : An Overview - Mobile Communication - guided transmission, unguided transmission - signal propagation frequencies, antennae, modulation, modulation methods and standards for voice-oriented data communication standards, modulation methods and standards for data and voice communication, mobile computing - novel applications and limitations, mobile computing architecture, mobile system networks.

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:

Wireless medium access control, CDMA, 3G and 4G communication : Modulation, Multiplexing, Controlling the medium access, Spread spectrum, Coding methods, IMT-2000/3G wireless communication standards, WCDMA 3 G communication standards, CDMA 3G communication standards, Broadband wireless access, 4G networks.

UNIT-V:

Mobile IP Network layer: IP and 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 TCP.

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:

Mobile Wireless Short Range Networks and Mobile Internet : Wireless networking and wireless LAN, Wireless LAN (WLAN) architecture, IEEE 802.11 protocol layers, Wireless application protocol (WP)-WAP1.1 architecture, wireless datagram protocol (WDP), Wireless Transport Layer Security (WTLS), wireless transaction and session layers, wireless application environment.

TEXT BOOK:

1. RAJ KAMAL, "Mobile Computing," second edition, Oxford.
2. ASOKE K TALUKDER, HASAN AHMED, ROOPA R YAVAGAL, "Mobile Computing, Technology Applications and Service Creation" Second Edition, Mc Graw Hill.

REFERENCE BOOKS:

1. UWE Hansmann, Lothar Merk, Martin S. Nocklous, Thomas Stober, "Principles of Mobile Computing," Second Edition, Springer.
2. Jochen Schiller, "Mobile Communications," second edition, Pearson



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KANAKINADA

IV Year B.Tech. IT. I-Sem.

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

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

UNIT-III:

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, 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:

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-VI:

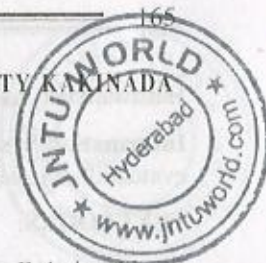
User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext.

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.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

TEXT BOOKS:

1. Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.

REFERENCE BOOKS:

1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
2. Modern Information Retrieval By Yates Pearson Education.
3. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, WAKINADA

IV Year B.Tech. IT. I-Sem.

PARALLEL COMPUTING

UNIT I:

Introduction: Computational demand in various application areas, advent of parallel processing, terminology-pipelining, Data parallelism and control parallelism-Amdahl's law. Basic parallel random access Machine Algorithms-definitions of P, NP and NP-Hard, NP-complete classes of sequential algorithms; NC-class for parallel algorithms.

UNIT II:

Scheduling: Organizational features of Processor Arrays, Multi processors and multi-computers. Mapping and scheduling aspects of algorithms. Coffman-graham scheduling algorithm for parallel processors.

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:

Algorithms-2: Fast Fourier Transform algorithms. Implementation on Hyper cube architectures. Solving linear file -system of equations, parallelizing aspects of sequential methods back substitution and Tri diagonal.

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
2. Programming Parallel Algorithms, Guy E. Blelloch, Communications of the ACM

**IV Year B.Tech. IT. I-Sem.****DISTRIBUTED SYSTEMS****UNIT I:**

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and The Web, Challenges.

UNIT II:

System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations, Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model.

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:

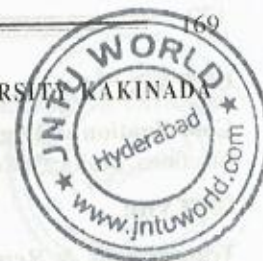
Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects- Object Model, Distributed Object Model, Design Issues for RMI, Implementation of RMI, Distributed Garbage Collection; Remote Procedure Call, Events and Notifications, Case Study: JAVARMI

UNIT V:

Operating System Support: Introduction, The Operating System Layer, Protection, Processes and Threads - Address Space, Creation of a New Process, Threads.

UNIT VI:

Distributed File Systems: Introduction, File Service Architecture; Peer-to-Peer Systems: Introduction, Napster and its Legacy, Peer-to-Peer Middleware, Routing Overlays.



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.

TEXT BOOKS:

1. Ajay D Kshemkalyani, Mukesh Sigal, "Distributed Computing, Principles, Algorithms and Systems", Cambridge
2. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems- Concepts and Design", Fourth Edition, Pearson Publication



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT. I-Sem.

ARTIFICIAL INTELLIGENCE**UNIT I:**

Introduction to artificial intelligence: Introduction, history, intelligent systems, foundations of AI, applications, tic-tac-toe 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, propositional logic, natural deduction system, axiomatic system, semantic tableau system in propositional logic, resolution refutation in propositional 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, cyc 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

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Artificial Intelligence, structures and Strategies for Complex problem solving, -George F Luger, 5th ed, PEA
2. Introduction to Artificial Intelligence. Ertel, Wolf Gang, Springer
3. Artificial Intelligence, A new Synthesis, Nils J Nilsson, Elsevier



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. I-Sem.

COMPUTER ARCHITECTURE

UNIT I:

Parallel Computer: The state of computing- Computer Development Milestones, Elements of Modern Computers, Evolution of Computer Architecture, System Attributes to performance; Multiprocessors and Multicomputers-Shared Memory Multiprocessors, Distributed Memory Multiprocessors, A Taxonomy of MIMD Computers; Multivector and SIMD Computers- Vector Super computers, SIMD Supercomputers.

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:

Design space of processors, Instruction-set Architectures, Characteristics of typical CISC and RISC Architecture, Hierarchical Memory Technology, Inclusion, Coherence and Locality.

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:

Multiprocessor and Multivector Computers- Hierarchical Bus Systems, Crossbar Switch and Multiport Memory; Multistage and Combining Networks- Routing, The Hot-Spot Problem, Applications and Drawbacks, Multistage Networks in Real Systems; Multivector Computers: Vector Processing Principles- Vector Instruction Types, Vector Access Memory Schemes, Cray Y-MP Multivector Multiprocessors- Cray Y-MP 816 System Organization, Multistage Crossbar Network in the Cray Y-MP 816.



UNIT VI:

Cache Coherence and Message Passing Mechanisms- Cache Coherence problem-Two protocol approaches, Snoopy Bus Protocols, Directory based Protocols; Message Passing Mechanisms- Message-Routing Schemes, Deadlock Virtual Channels, Flow Control Strategies, Multicast Routing Algorithms.

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: Trends in Parallel Systems: Forms of Parallelism- Structural Parallelism versus Instruction Level Parallelism, A Simple Parallel Computation, Parallel Algorithms, Stream Processing; Cray Line of Computer Systems;

TEXT BOOKS:

1. KAI HWANG & NARESH JOTWANI "Advanced Computer Architecture- Parallelism, Scalability, Programmability" Second Edition, Mc Graw Hill Publishing.
2. HENNESSY PATTERSON, "Computer Architecture- A Quantitative Approach" Fifth Edition, Elsevier

REFERENCE BOOKS:

1. http://www.google.co.in/search?q=npTEL+computer+a+rchitecture&hl=en&sa=X&gbv=2&prmd=ivns&source=univ&tbm=vid&tbo=u&ei=n-leT-quOcvjrAej1e2MBg&oi=video_result_group&ct=title&resnum=6&ved=0CCcQqwQwBQ&gs_sm=12&gs_upl=312191312191013214111110101010203120312-11110&oq=NPTEL+Comp&aq=6&aqi=g10&aql=
2. Computer Architecture, Concepts and Evolutions, Garrit A Blaauw, PEA

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA****IV Year B.Tech. IT. I-Sem.****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



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT. I-Sem.

MOBILEAPPLICATIONDEVELOPMENTLAB

1. Write a J2ME 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 MIDP 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 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 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 HTTP 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.

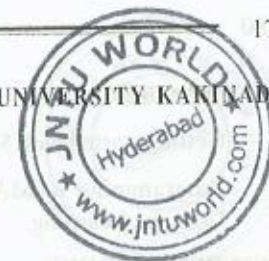


12. Write an Android application program that demonstrates the following:
- LinearLayout
 - RelativeLayout
 - TableLayout
 - GridView layout
13. Write an Android application program that converts the temperature in Celsius to Fahrenheit.
14. Write an Android application program that demonstrates intent in mobile application development.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT. I-Sem.

MATLAB



UNIT I:

Introduction: What is MATLAB, Basics of MATLAB, MATLAB windows, on-line help, input-output, file types.

UNIT II:

MATLAB Basics: A Minimum MATLAB Session, Creating and Working with Arrays of Numbers, Creating and Printing Simple Plots, Creating, Saving, and Executing a Script File, Creating and Executing a Function File.

UNIT III:

Arrays and matrices: Matrices and Vectors, Input, Indexing, Matrix manipulation, Creating vectors, Matrix and Array Operations, Arithmetic operations, Relational operations, Logical operations, Elementary math functions, Matrix functions.

UNIT IV:

Programming basics: Relational and logical operators, if-end structure, if-else-end structure, if-elseif-else-end structure, switch-case statement, for-end loop, while-end loop, break and continue commands.

UNIT V:

Scripts and Functions: Script Files, Function Files, Executing a function, Subfunctions, Nested functions.

UNIT VI:

Graphics: Basic 2-D Plots, Style options, Labels, title, legend, and other text objects, Modifying plots with the plot editor, 3-D Plots, Mesh and surface plots.

UNIT VII:

Handle graphics: The object hierarchy, Object handles, Object properties, modifying an existing plot.

UNIT VIII:

Graphical user interface (GUI): how a GUI works, creating and displaying a GUI.

TEXTBOOKS:

1. Getting started with MATLAB by Rudra Pratap, Nov 2009. PHI
2. Programming in MATLAB for Engineers by Stephen J. Chapman, Cengage Learning.

REFERENCE BOOKS:

1. MATLAB: An introduction with Applications by Amos Gilat, Wiley Student edition.
2. MATLAB for Engineering Explained, Gusfafsso, Fredrik, Bergman, Niclas

**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:

Web Services Security – XML security frame work, XML encryption, XML digital signature, XKMS structure, guidelines for signing XML documents.

TEXT BOOKS:

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.Coyle, Pearson Education.
4. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

REFERENCE BOOKS:

1. Building Web Services with Java, 2nd Edition, S. Graham and others, Pearson Education.
2. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly,SPD.
3. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers, 2005.
4. J2EE Web Services, Richard Monson-Haefel, Pearson Education.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT, I-Sem.

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:

LINUX: Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux.

UNIT III:

OPEN SOURCE DATA BASE: MySQL: Introduction – Setting up account – Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time– Sorting Query Results – Generating Summary – Working with metadata – Usings equences – MySQL and Web.

UNIT IV:

OPEN SOURCE PROGRAMMING LANGUAGES : PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays – OOP – String 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.

TEXT BOOKS:

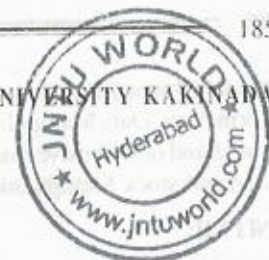
1. Remy Card, Eric Dumas and Frank Mevel, "The Linux Kernel Book", Wiley Publications, 2003
2. Steve Suchring, "MySQL Bible", John Wiley, 2002

REFERENCES:

1. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2002
2. Wesley J. Chun, "Core Python Programming", Prentice Hall, 2001
3. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
5. Vikram Vaswani, "MYSQL: The Complete Reference", 2nd Edition, Tata McGraw - Hill Publishing Company Limited, Indian Reprint 2009.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT. I-Sem.

CYBERLAWS**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:

Cyber Pornography, Other IT Offences, Monetary Penalties, Adjudication and Appeals Under IT Act 2000, Network Service Providers, Jurisdiction and Cyber Crimes, Nature of Cyber Criminality Strategies to Tackle Cyber Crime and Trends, Criminal Justice in India and Implications.

UNIT IV:

Digital Signatures, Certifying Authorities and E-Governance: Digital Signatures, Digital Signature Certificate, Certifying Authorities and Liability in the Event of Digital Signature compromise, E-Governance in the India. A Warning to Babudom, Are Cyber Consumers Covered under the Consumer Protection, Goods and Services, Consumer Complaint Defect in Goods and Deficiency in Services Restrictive and Unfair Trade Practices

UNIT V:

Traditional Computer Crime: Early Hacker and Theft of Components

Traditional problems, Recognizing and Defining Computer Crime. Phreakers: Yesterday's Hackers, Hacking, Computers as Commodities, Theft of intellectual Property

UNIT VI:

Web Based Criminal Activity, Interference with Lawful Use of Computers, Malware, 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, Goods and service, consumer compliant, restricted and unfair trade practices

TEXTBOOKS:

1. Vivek Sood, "Cyber Law Simplified", Tata McGraw Hill
2. Marjie T. Britz, "Computer Forensics and Cyber Crime", Pearson.
3. Cyber Laws Texts and Cases, Ferrera, CENGAGE



S. No.	Subject	T	P	Credits
1	Elective –II i) Human Computer Interaction ii) Advanced Operating Systems iii) Mobile Adhoc & Sensor Networks iv) Pattern Recognition v) Digital Image Processing	4	-	4
2	Elective –III i) Embedded and Real time Systems ii) Simulation and Modeling iii) Computer Forensics iv) Machine Learning v) Multimedia & Application Development	4	-	4
3	Elective –IV i) Software Testing Methodologies ii) Neural Networks & Soft Computing iii) Social Networks and the Semantic Web iv) Cloud Computing v) E- Commerce	4	-	4
4	Software Project Management	4	-	4
5	Project			12
	Total			28

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT. II-Sem.

HUMAN COMPUTER INTERACTION

UNIT I:

Introduction: Importance of user Interface, definition, importance of good design. Benefits of good design. A brief history of Screen design

UNIT II:

The graphical user interface: Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user –interface popularity, characteristics- Principles of user interface.

UNIT III:

Design process: Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT IV:

Screen Designing : Design goals, Screen planning and purpose, organizing screen elements, ordering of screen data and content, screen navigation and flow, Visually pleasing composition, amount of information, focus and emphasis, presentation information simply and meaningfully, information retrieval on web, statistical graphics, Technological consideration in interface design.

UNIT V:

Windows: Windows new and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT VI:

Components: Components text and messages, Icons and increases, Multimedia, colors, uses problems, choosing colors.

UNIT VII:

Software tools: Specification methods, interface, Building Tools.

UNIT VIII:

Interaction Devices: Keyboard and function keys, pointing devices, speech

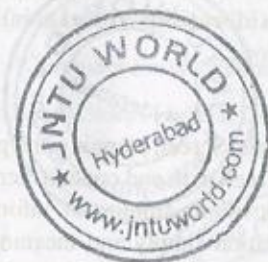
recognition digitization and generation, image and video displays, drivers.

TEXT BOOKS:

1. Human Computer Interaction, 3/e, Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, PEA, 2004.
2. The Essential guide to user interface design, 2/e, Wilbert O Galitz, Wiley DreamaTech.

REFERENCE BOOKS:

1. Human Computer, Interaction Dan R.Olsan, Cengage, 2010.
2. Designing the User Interface. 4/e, Ben Shneidermann, PEA.
3. User Interface Design. Soren Lauesen, PEA.
4. Interaction Design PRECE, ROGERS, SHARPS, Wiley.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT, II-Sem.

ADVANCED OPERATING SYSTEMS

UNIT-I:

Computer System and Operating System Overview: Overview of Computer System hardware – Instruction execution – I/O function – Interrupts – Memory hierarchy – I.O Communication techniques. Operating System Objectives and functions – Evaluation of operating System – Example Systems.

UNIT-II:

Introduction to Distributed systems: Goals of distributed system, hardware and software concepts, design issues.

Communication in Distributed systems: Layered protocols, ATM networks, the Client - Server model, remote procedure call and group communication.

UNIT-III:

Synchronization in Distributed systems: Clock synchronization, Mutual exclusion, E-tech algorithms, the Bully algorithm, a ring algorithm, atomic transactions.

UNIT-IV:

Deadlocks: deadlock in distributed systems, Distributed deadlock prevention, and distributed deadlock detection.

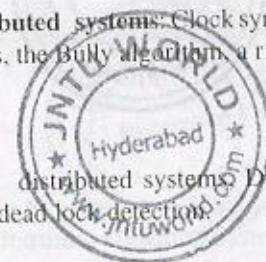
UNIT-V:

Processes: Processes and Processors in distributed systems: Threads, system models, Processor allocation, Scheduling in distributed system, Fault tolerance and real time distributed systems.

UNIT-VI: Distributed file systems: Distributed file systems design, distributed file system implementation, trends in distributed file systems.

UNIT - VII: Distributed shared memory : What is shared memory, consistency models, page based distributed shared memory, shared variable distributed shared memory, object based DSM.

UNIT-VIII: Case study MACH : Introduction to MACH, process management in MACH, memory management in MACH, communication in MACH, UNIX emulation in MACH. Case study DCE : Introduction to DCE



threads, RPC's, Time service, Directory service, security service, Distributed file system.

TEXT BOOKS:

1. Distributed Operating System - Andrew. S. Tanenbaum, PHI
2. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition- 2005, Pearson education/PHI.

REFERENCE BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/ PHI



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA IV Year B.Tech. IT. II-Sem.

MOBILE AD HOC AND SENSOR NETWORKS

UNIT-I:

Introduction to Ad Hoc Wireless Networks

Cellular and Ad Hoc Wireless Networks, Characteristics of MANETs, Applications of MANETs, Issues and Challenges of MANETs.

UNIT-II:

Routing in MANETs

Classification of Routing Protocols, Topology-based versus Position-based Approaches, Topology based Routing Protocols; Position based Routing, Other Routing Protocols.

UNIT-III:

Data Transmission in MANETs

The Broadcast Storm, Multicasting, Geocasting, TCP over Ad Hoc Networks- TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc

UNIT-IV:

Security in MANETs

Security in Ad Hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems.

UNIT-V:

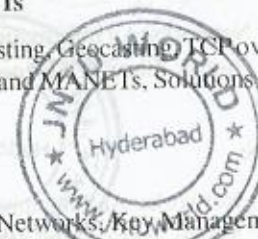
Basics of Wireless Sensors and Applications

The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications

UNIT-VI:

Data Retrieval in Sensor Networks

Classification of WSNs, MAC Layer, Routing Layer, High-Level Application Layer Support, Adapting to the Inherent Dynamic Nature of WSNs.



UNIT-VII:**Sensor Network Platforms and Tools**

Sensor Node Hardware, Sensor Network Programming Challenges, Node-Level Software Platforms, Node-Level Simulators,

UNIT-VIII:**Security in WSNs**

Security in Wireless Sensor Networks, Key Management in Wireless Sensor Networks, Secure Data Aggregation in Wireless Sensor Networks, Introduction to Vehicular Ad Hoc Networks, Introduction to Wireless Mesh Networks

TEXT BOOKS:

1. Ad Hoc and Sensor Networks: Theory and Applications, Carlos de Morais Cordeiro and Dharma Prakash Agrawal, World Scientific Publications / Cambridge University Press, 2006.
2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science Imprint, Morgan Kaufman Publishers, 2005.

REFERENCE BOOKS:

1. Ad Hoc Wireless Networks: Architectures and Protocols, C. Siva Ram Murthy and B. S. Manoj, Pearson Education, 2004.
2. Guide to Wireless Ad Hoc Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition, 2011.
3. Guide to Wireless Sensor Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition, 2012.
4. Wireless Mesh Networking, Thomas Krag and Sebastin Buettrich, O'Reilly Publishers, 2007.
5. Wireless Sensor Networks – Principles and Practice, Fei Hu, Xiaojun Cao, An Auerbach book, CRC Press, Taylor & Francis Group, 2010.
6. Wireless Ad hoc Mobile Wireless Networks-Principles, Protocols and

Applications, Subir Kumar Sarkar, et al., Auerbach Publications, Taylor & Francis Group, 2008.

7. Wireless Ad hoc Networking, Shih-Lin Wu, Yu-Chee Tseng, Auerbach Publications, Taylor & Francis Group, 2007
8. Wireless Ad hoc and Sensor Networks – Protocols, Performance and Control, Jagannathan Sarangapani, CRC Press, Taylor & Francis Group, 2007. rp 2010.
9. Security in Ad hoc and Sensor Networks, Raheem Beyah, et al., World Scientific Publications / Cambridge University Press, 2010



PATTERN RECOGNITION

UNIT-I:

Introduction: Is Pattern Recognition Important; features, feature vectors, and classifiers; supervised, unsupervised and semi supervised learning; Matlab programs.

UNIT-II:

Classifiers based on Bayes Decision Theory: Introduction, Bayes Decision Theory; discriminant functions and decision surfaces; Bayesian classification for normal distributions- the Gaussian probability density function, the Bayesian classifier for normally distributed classes;

UNIT-III:

Linear & Non linear Classifiers: Introduction; linear discriminant functions and decision hyper planes, the perceptron algorithm, Nonlinear Classifiers: introduction, the xor problem, the two-layer perceptron-classification capabilities of the two-layer perceptron; three layer perceptron.

UNIT-IV:

Feature Selection: Introduction, Preprocessing- outlier removal, data normalization, missing data; the peaking phenomenon; class separability measures- divergence, chernoff bound and Bhattacharya distance, scatter matrices.

UNIT-V:

Supervised Learning: introduction, error-counting approach, exploiting the finite size of the data set; a case study from medical imaging; semi supervised learning- generative models, graph-based methods, transductive support vector machines.

Unit-VI:

Skin based Pattern Extraction And Recognition -Introduction, Neural color Constancy based skin detection, Image segmentation, Local region graph Pattern, Skin region Synthesis pattern, Matching multiple regions with Local Global Graph Method.

UNIT-VII:

Spatio Temporal Patterns - Measuring similarity patterns-Introduction-Spatio-temporal data collection, representation, data summarization, Querying Indexing and Clustering of moving object Patterns and trajectories, group patterns mining, mobile patterns, Predicting, similarity measures, 1 data generation, Trajectory representation, Defining a new similarity measure, Clustering trajectories with K-means algorithm, Incremental approach for clustering.

UNIT-VIII:

Graph-based methods Introduction, Hyper graph matching and Algorithms, Parquet graphs-similarity function, Local Feature Detectors.

TEXT BOOKS:

1. Sergios Theodoridis, Konstantinos Koutroumbas, "Pattern Recognition" Fourth Edition, (Unit I-V) Elsevier
2. Horst Bunke, Abrahamkadel, Marks Last, "Applied Pattern Recognition" 2008 Springer-Verlag Berlin Heidelberg. (Unit VI-VIII)

REFERENCE BOOKS:

1. "Pattern Recognition", Devi & Murthy, Universities Press
2. "Pattern Recognition and Image Analysis", Gose, Johnsonbaugh, Jost, PHI
3. Rajjan Shinghal, "Pattern Recognition Techniques and Applications" Oxford University Press.
4. Pattern Classification, 2nd ed, Richard O Duda
5. Applied Pattern recognition, Horst Bunku, Abraham Kandel

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. II-Sem.

DIGITAL IMAGE PROCESSING**UNIT-I:**

DIGITAL IMAGE FUNDAMENTALS: Image Sensing and Acquisition, Image Sampling & quantization, some basic Relationships between pixels. Mathematical tools used in digital image processing – array Vs matrix operations, linear Vs non linear operations, arithmetic operations, set and logical operations, spatial operations, vector and matrix operations, Probabilistic methods.

UNIT-II:

IMAGE TRANSFORMS: 2D-DFT and properties, Walsh Transform, Hadamard Transform, Discrete cosine Transform, Haar-Transform, Slant Transform, KL transform, comparison of different image transforms.

UNIT-III:

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Basic Intensity transformations functions, histogram Processing, fundamentals of Spatial Filtering, Smoothing Spatial filters, Sharpening spatial filters, Combining spatial enhancement methods.

UNIT-IV:

IMAGE ENHANCEMENT IN FREQUENCY DOMAIN: Basics of filtering in frequency domain, additional characteristics of the frequency domain, correspondence between filtering in the spatial and frequency domains. Image smoothing using frequency domain filters, image sharpening using frequency domain filters – Gaussian High pass filters, Laplacian in the frequency domain, Homomorphic filtering.

UNIT-V:**IMAGE DEGRADATION/RESTORATION:**

Noise models, Restoration in the presence of Noise only-spatial filtering, - mean, order- statistic and adaptive filters, Estimating the Degradation function, Inverse filtering, Weiner filtering, Constrained Least squares filtering.

UNIT-VI:**IMAGE SEGMENTATION:**

Point, line and edge Detection, Thresholding, Region based segmentation, the use of motion in segmentation.

UNIT-VII:

IMAGE COMPRESSION: Need for Image compression, Classification of Redundancy in Images, Image compression models, Classification of image compression schemes, Run length coding, arithmetic coding, Block truncation coding, Dictionary based compression, transform based compression, Image compression standards, Scalar quantization, vector quantization.

UNIT-VIII:

COLOR IMAGE PROCESSING: Color models, pseudo color image processing, color transformations, Smoothing and sharpening, image segmentation based on color.

TEXT BOOKS:

1. Digital Image processing – S. Jayaraman, S. Esakkirajan, T. Veerakumar, Tata McGraw Hill.
2. Digital Image Processing – R. C. Gonzalez & R.E. Woods, Addison Wesley/Pearson education, 3rd Edition, 2010.

REFERENCES:

1. Digital Image processing using MATLAB – Rafael C. Gonzalez, Richard E woods and Steven L. Eddins, Tata McGraw Hill, 2010.
2. Fundamentals of Digital Image processing – A. K. Jain, PHI.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. II-Sem.

EMBEDDED AND REAL TIME SYSTEMS

Unit I:

Introduction to Embedded systems: What is an embedded system Vs. General computing system, history, classification, major application areas, and purpose of embedded systems. Core of embedded system, memory, sensors and actuators, communication interface, embedded firmware, other system components, PCB and passive components.

UNIT II:

8-bit microcontrollers architecture: Characteristics, quality attributes application specific, domain specific, embedded systems. Factors to be considered in selecting a controller, 8051 architecture, memory organization, registers, oscillator unit, ports, source current, sinking current, design examples.

UNIT III:

Interrupt, timers and serial ports of 8051: 8051 interrupts, interfacing ADC 0801, Timers, serial port, reset circuit, power saving modes.

UNIT IV:

Programming the 8051 Micro controller: Addressing modes, Instruction set, data transfer instructions, Arithmetic Instructions, Logical Instructions, Arithmetic Instructions, logical instructions, Boolean, Program control transfer instructions.

UNIT V:

RTOS and Scheduling, Operating basics, types, RTOS, tasks, process and threads, multiprocessing and multitasking, types of multitasking, non preemptive, preemptive scheduling.

UNIT VI:

Task communication of RTOS, Shared memory, pipes, memory mapped objects, message passing, message queue, mailbox, signaling, RPC and sockets, task communication/synchronization issues, racing, deadlock, live lock, the dining philosopher's problem.

UNIT VII:

The producer-consumer problem, Reader writers problem, Priority Inversion, Priority ceiling, Task Synchronization techniques, busy waiting, sleep and wakeny, semaphore, mutex, critical section objects, events, device, device drivers, how to clause an RTOS. Integration and testing of embedded hardware and fire ware.

UNIT VIII:

Simulators, emulators, Debuggers, Embedded Product Development life cycle (EDLC), Trends in embedded Industry, Introduction to ARM family of processor.

TEXT BOOK:

1. Introduction to Embedded Systems Shibu.K.V, TMH, 2009.

REFERENCE BOOKS:

1. Embedded Systems, Rajkamal, TMH, 2009.
2. Embedded Software Primer, David Simon, Pearson.
3. The 8051 Microcontroller and Embedded Systems, Mazidi, Mazidi, Pearson.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. II-Sem.

SIMULATION AND MODELLING

UNIT I:

System models: Concepts, continuous and discrete systems, System modeling, types of models, subsystems, corporate model, and system study.

UNIT II:

System Simulation: Techniques, comparison of simulation and analytical methods, types of simulation, Distributed log models, cobweb models.

UNIT III:

Continuous system Simulation: Numerical solution of differential equations, Analog Computers, Hybrid Computers, continuous system simulation languages CSMP, system dynamic growth models, logistic curves.

UNIT IV:

Probability concepts in simulation: Monte Carlo techniques, stochastic variables, probability functions, Random Number generation algorithms.

UNIT V:

Queuing Theory: Arrival pattern distributions, servicing times, queuing disciplines, measure of queues, mathematical solutions to queuing problems.

UNIT VI:

Discrete System Simulation: Events, generation of arrival patterns, simulation programming tasks, analysis of simulation output.

UNIT VII:

GPSS & SIMSCRIPT: general description of GPSS and SIMSCRIPT, programming in GPSS.

UNIT VIII:

Simulation Programming Techniques: Data structures, Implementation of activities, events and queues, Event scanning, simulation algorithms in GPSS and SIMSCRIPT.

TEXT BOOK:

1. Geoffrey Gordon: System Simulation, PHI.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. II-Sem.

COMPUTER FORENSICS

Unit I:

Computer Forensics and Investigations: Understanding Computer Forensics, Preparing for Computer Investigations, Taking A Systematic Approach, Procedure for Corporate High-Tech Investigations, Understanding Data Recovery Workstations and Software.

Unit II:

Investor's Office and Laboratory: Understanding Forensics Lab Certification Requirements, Determining the Physical Requirements for a Computer Forensics Lab, Selecting a Basic Forensic Workstation

Unit III:

Data Acquisition: Understanding Storage Formats for Digital Evidence, Determining the Best Acquisition Method, Contingency Planning for Image Acquisitions, Using Acquisition Tools, Validating Data Acquisition, Performing RAID Data Acquisition, Using Remote Network Acquisition Tools, Using Other Forensics Acquisition Tools

Unit IV:

Processing Crime and Incident Scenes: Identifying Digital Evidence, Collecting the Evidence in Private Sector Incident Scenes, Processing law Enforcement Crime Scenes, Preparing for a Search, Securing a Computer Incident or Crime Scene, Sizing Digital evidence at the Scene, Storing Digital evidence, obtaining a Digital Hash.

Unit V:

Current Computer Forensics Tools: Evaluating Computer Forensics Tool Needs, Computer Forensics Software Tools, Computer Forensics Hardware Tools, Validating and Testing Forensics Software

Unit VI:

Computer Forensics Analysis and Validation: Determining What Data to Collect and Analyze, Validating Forensic Data, Addressing Data-Hiding Techniques, Performing Remote Acquisition

Unit VII:

Recovering Graphics and Network Forensics: Recognizing a Graphics File, Understanding Data Compression, Locating and Recovering Graphics Files, Understanding Copyright Issues with Graphics, Network Forensic, Developing Standard Procedure for Network Forensics, Using Network Tools, Examining Hiney Project.

Unit VIII:

E-mail Investigations Cell Phone and Mobile Device Forensics: Exploring the Role of E-mail in Investigations, Exploring the Role of Client and Server in E-mail, Investigating E-mail Crimes and Violations, Understanding E-mail Servers, Using Specialized E-mail Forensics Tools, Understanding Mobile Device Forensics, Understanding Acquisition Procedure for Cell Phones and Mobile Devices

TEXTBOOKS:

1. Nelson, Phillips Enfinger, Stuart, " Computer Forensics and Investigations, Cengage Learning.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA****IV Year B.Tech. IT. II-Sem.****MACHINE LEARNING****UNIT I:**

Introduction: Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning.

UNIT II:

Concept 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 III:

Decision Tree learning: Decision tree representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning

UNIT IV:

Bayesian learning: Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Bayes optimal classifier, Naïve bayes classifier, An example learning to classify text, Bayesian belief networks.

UNIT V:

Computational learning theory-1: Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis Space, Sample Complexity for infinite Hypothesis Spaces, The mistake bound model of learning - Instance-Based Learning- Introduction.

UNIT VI:

Computational learning theory-2: k -Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning

UNIT VII:

Learning Sets of Rules: Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution

UNIT VIII:

Analytical Learning: Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

TEXTBOOK:

1. Machine Learning, Tom M. Mitchell, MGH



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT, II-Sem.

MULTIMEDIA AND APPLICATION DEVELOPMENT**UNIT-I:**

Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT-II:

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT-III:

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classed Authoring an ActionScript Class.

UNIT-IV:

Action Script II: Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

UNIT-V:

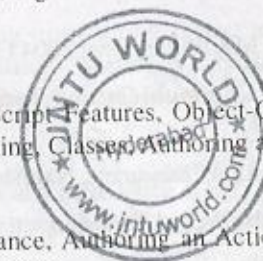
Application Development: An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.

UNIT-VI:

Multimedia data compression: Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT-VII:

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.



UNIT – VIII:

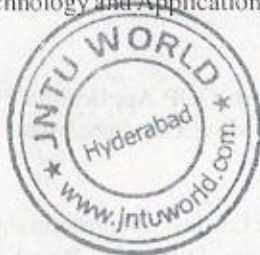
Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications: Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MOD).

TEXT BOOKS:

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/ Pearson Education.
2. Essentials ActionScript 2.0, Colin Mook, SPD O,REILLY.

REFERENCE BOOKS:

1. Digital Multimedia, Nigel Chapman and Jenny Chapman, Wiley-Dreamtech
2. Macromedia Flash MX Professional 2004 Unleashed, Pearson.
3. Multimedia and Communications Technology, Steve Heath, Elsevier(Focal Press).
4. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
5. Multimedia Basics by Weixel Thomson
6. Multimedia Technology and Applications, David Hilman , Galgotia



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
IV Year B.Tech. IT. II-Sem.

SOFTWARE TESTING METHODOLOGIES**UNIT I:**

Introduction: - Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

UNIT II:

Flow graphs and Path testing:- Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT III:

Transaction Flow Testing:-transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing

UNIT IV:

Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT V:

Paths, Path products and Regular expressions:- path products & path _expression, reduction procedure, applications, regular expressions & flow anomaly detection.

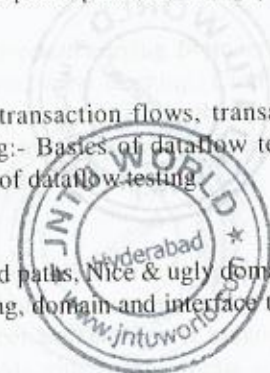
UNIT VI:

Logic Based Testing: - overview, decision tables, path expressions, kv charts, specifications.

UNIT VII:

State, State Graphs and Transition testing:- state graphs, good & bad state graphs, state testing, Testability tips.

UNIT VIII: Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.



TEXTBOOKS:

1. Software Testing Techniques - Boris Beizer, International Thomson computer press, second edition.
2. Software Testing- Yogesh Singh, CAMBRIDGE

REFERENCE BOOKS:

1. Introduction to Software Testing, Paul Amman, Jeff Offutt, CAMBRIDGE
2. Effective Software Testing, 50 Specific ways to improve your testing, Elfriede Dustin, PEA



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IV Year B.Tech. IT. II-Sem.

NEURAL NETWORKS & SOFT COMPUTING**UNIT I:**

INTRODUCTION: what is a neural network? Human Brain, Models of a Neuron. Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks (Chapter-1 from Neural networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2nd edition 2004)

UNIT II:

LEARNING PROCESS: Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process, (Chapter-2 from Neural networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2nd edition 2004)

UNIT III:

Classical & Fuzzy Sets: Introduction to classical sets, properties, operations and relations; Fuzzy sets – memberships, uncertainties, operations, properties, fuzzy relations, cardinalities, membership functions (Chapter-6 from Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications by Rajasekharan and Pai, PHI Publications).

UNIT IV:

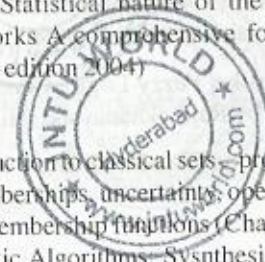
Fuzzy Logic System Components: Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods (Chapter-7 from Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications by Rajasekharan and Pai, PHI Publications).

UNIT V:

Concept Learning: Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm (Chapter-2 of Machine Learning, Tom M. Mitchell, MGH).

UNIT VI:

Decision Tree learning: Introduction, Decision tree representation,



Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning (Chapter-3 of Machine Learning, Tom M. Mitchell, MGH).

UNIT VII:

Genetic Algorithms-1: Motivation, Genetic Algorithms, An Illustrative Example, Hypothesis Space Search (Chapter-9 from Machine Learning, Tom M. Mitchell, MGH).

UNIT VIII:

Genetic Algorithms-2: Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms (Chapter-9 from Machine Learning, Tom M. Mitchell, MGH).

TEXT BOOKS:

1. Neural Networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2nd edition 2004
2. Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications by Rajasekharan and Pai, PHI Publications
3. Machine Learning ,Tom M. Mitchell, MGH

IV Year B.Tech. IT. II-Sem.

SOCIAL NETWORKS AND THE SEMANTIC WEB

UNIT-I:

The Semantic web: Limitations of the current Web, The semantic solution, Development of the Semantic Web, The emergence of the social web.

UNIT-II:

Social Network Analysis: What is network analysis?, Development of Social Network Analysis, Key concepts and measures in network analysis.

UNIT-III:

Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities, Web-based networks.

UNIT-IV:

Knowledge Representation on the Semantic Web: Ontologies and their role in the Semantic Web, Ontology languages for the Semantic Web.

UNIT-V:

Modeling and Aggregating Social Network Data: State of the art in network data representation, Ontological representation of social individuals, Ontological representation of social relationships, Aggregating and reasoning with social network data.

UNIT-VI:

Developing social semantic applications: Building Semantic Web applications with social network features, Flink- the social networks of the Semantic Web community, Open academia: distributed, semantic-based publication management.

Unit-VII:

Evaluation of Web-Based Social Network Extraction: Differences between survey methods and electronic data extraction, context of the empirical study, Data collection, Preparing the data, Optimizing goodness of fit, Comparison across methods and networks, Predicting the goodness of fit, Evaluation through analysis.

UNIT VIII:

The Perfect Storm: Looking back-the story of Katrina People Finder, Looking ahead-a Second Life.

TEXT BOOK:

1. Peter Mika, "Social Networks and the Semantic Web", Springer International Edition.

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IV Year B.Tech. IT. II-Sem.

CLLOUD COMPUTING

UNIT-I:

Introduction to virtualization and virtual machine, Virtualization in Cluster / grid context Virtual network, Information model & data model for virtual machine, Software as a Service (SaaS), SOA, On Demand Computing.

UNIT-II:

Cloud computing: Introduction, What it is and What it isn't, from Collaborations to Cloud, Cloud application architectures, Value of cloud computing, Cloud Infrastructure models, Scaling a Cloud Infrastructure, Capacity Planning, Cloud Scale.

UNIT-III:

Data Center to Cloud: Move into the Cloud, Know Your Software Licenses, The Shift to a Cloud Cost Model, Service Levels for Cloud Applications

UNIT IV:

Security: Disaster Recovery, Web Application Design, Machine Image Design, Privacy Design, Database Management, Data Security, Network Security, Host Security, Compromise Response

UNIT-V:

Defining Clouds for the Enterprise- Storage-as-a-Service, Database-as-a-Service, Information-as-a-Service, Process-as-a-Service, Application-as-a-Service,

UNIT VI:

Platform-as-a-Service, Integration-as-a-Service, Security-as-a-Service, Management/Governance-as-a-Service, Testing-as-a-Service Infrastructure-as-a-Service

UNIT-VII:

Disaster Recovery, Disaster Recovery, Planning, Cloud Disaster Management

UNIT VIII:

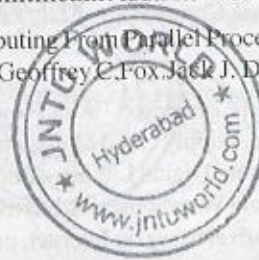
Case study: Types of Clouds, Cloudcentres in detail, Comparing approaches, Xen OpenNEBula , Eucalyptus, Amazon, Nimbus

TEXT BOOKS:

1. Cloud Computing – Web Based Applications That Change the way you Work and Collaborate Online – **Michael Miller**, Pearson Education.
2. Cloud Application Architectures, 1st Edition by **George Reese** O'Reilly Media.

REFERENCE BOOK:

1. Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide **David S. Linthicum** Addison-Wesley Professional
2. Distributed & Cloud Computing From Parallel Processing to the Internet of Things by Kai Hwang, Geoffrey C.Fox, Jack J. Dongarra.



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IV Year B.Tech. IT. II-Sem.

E-COMMERCE

UNIT – I:

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT – II:

Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT – III:

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

UNIT-IV:

Inter Organizational Commerce- EDI, EDI Implementation, Value added networks.

UNIT – V:

Intra Organizational Commerce- work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT – VI: Corporate Digital Library, Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT – VII:

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT – VIII:

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processings, Desktop video conferencing.

TEXT BOOKS:

1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.
2. E-Commerce, strategy, Technology, and Implementation,

REFERENCE BOOKS:

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. IT. II-Sem.

SOFTWARE PROJECT MANAGEMENT

UNIT – I:

Conventional Software Management: The waterfall 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 processes, 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.

UNIT – IV:

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, Iteration workflows.

UNIT – V:

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT – VI:

Project Organizations and Responsibilities: Line-of-Business

Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

UNIT-VII:

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process: Process discriminants.

UNIT-VIII:

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

TEXTBOOK:

1. Software Project Management, Walker Royce, Pearson Education, 2005.

REFERENCE BOOKS:

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson.

