T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF INFORMATION TECHNOLOGY-R18

COURSE STRUCTURE& SYLLABUS

VII SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	**B67PE1**	1. Machine Learning 2. Internet of Things 3. Artificial Intelligence	3	0	0	3
2	**B67PE2**	1. Mobile Computing 2. Mobile Application development 3 Design Patterns	3	0	0	3
3	**B67PE3**	1. Information Security 2. Information Retrieval System 3. Distributed Systems	3	0	0	3
4		OE-III	3	0	0	3
5	**BE23**	Advanced Communication Skills Lab	0	0	3	1.5
6	**B67PE6**	1. Network Security 2. Neural Networks 3. Wireless Sensor Networks	3	0	0	3
7	**B67PW7**	Project Work Part-A	0	0	8	4
					Total	**20.5**

VIII SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits
1		**OE-II**	3	0	0	3
2	**B68PE2**	1. Big Data Analytics 2. SemanticWeb & Social Networks 3. Distributed Data Bases	3	0	0	3
3	**B68CV3**	Comprehensive Viva	0	0	6	3
4	**B68PW4**	Project Work Part – B	0	0	16	8
					Total	**17**

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

MACHINE LEARNING - B67PE1

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

COURSE OBJECTIVES:

1. To introduce students to the basic concepts and techniques of Machine Learning.
2. To develop skills of using recent machine learning software for solving practical problems.
3. To gain experience of doing independent study and research.

COURSE OUTCOMES:

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

UNIT- I:

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

UNIT – II:

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

UNIT – III:

Bayesian learning – Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, An example learning to classify text, Bayesian belief networks The EM algorithm
Computational learning theory– Introduction, Probability learningan approximately correct hypothesis, Sample complexity for Finite Hypothesis Space,
Sample Complexity for infinite Hypothesis Spaces, The mistake bound model of learning
Instance-Based Learning- Introduction, k -Nearest Neighbour Learning, Locally

Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning

Genetic Algorithms – Motivation, Genetic Algorithms, An illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

UNIT – IV:

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

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

UNIT – V:

Combining Inductive and Analytical Learning – Motivation, Inductive- Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to Alter the Search Objective, Using Prior Knowledge to Augment Search Operators,

Reinforcement Learning – Introduction, The Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

TEXT BOOKS

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

REFERENCE BOOKS

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

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

INTERNET OF THINGS - B67PE1

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

COURSE OBJECTIVES:

1. To introduce the terminology, technology and its applications
2. To introduce the concept of M2M (machine to machine) with necessary protocols
3. To introduce the Python Scripting Language which is used in many IoT devices
4. To introduce the Raspberry PI platform, that is widely used in IoT applications
5. To introduce the implementation of web based services on IoT devices.

COURSE OUTCOMES:

1. Able to understand IOT and API's and various technologies using IOT.
2. Able to identify network function virtualization.
3. Able to use various features of Python.
4. Able to work on the IOT devices.
5. Able to develop IOT web application using Python.

UNIT-I:

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, Iot Communication APIs, IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics,

Communication protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT-II:

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT. Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER

UNIT- III:

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling. Python packages - JSON, XML, HTTP Lib, URL Lib, SMTP Lib.

UNIT-IV:

IoT Physical Devices and Endpoints - Introduction to Raspberry PI - Interfaces (serial, SPI, I2C). Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT-V:

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Webserver – Web server for IoT, Cloud for IoT, Python web application framework. Designing a RESTful web API

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

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ARTIFICIAL INTELLIGENCE - B67PE1

B.Tech. VII Semester. **L/T/P/C**

3/0/0/3

COURSE OBJECTIVES:

1. To learn the difference between optimal reasoning vs human like reasoning
2. To understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities
3. To learn different knowledge representation techniques
4. To understand the applications of AI: namely Game Playing, Theorem Proving, Expert Systems, Machine Learning and Natural Language Processing

COURSE OUTCOMES:

1. Possess the ability to formulate an efficient problem space for a problem expressed in English.
2. Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
3. Possess the skill for representing knowledge using the appropriate technique
4. Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems, Machine Learning and Natural Language Processing

UNIT-I:

Introduction, History, Intelligent Systems, Foundations of AI, Sub areas of AI, Applications. 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. Game Playing, Bounded Look-ahead Strategy and use of Evaluation Functions, Alpha-Beta Pruning

UNIT-II:

Logic Concepts and Logic Programming: Introduction, Propositional Calculus, Propositional Logic, Natural Deduction System, Axiomatic System, Semantic Tableau System in Propositional Logic, Resolution Refutation in Propositional Logic, Predicate Logic, Logic Programming.

Knowledge Representation: Introduction, Approaches to Knowledge Representation, Knowledge Representation using Semantic Network, Extended Semantic Networks for KR, Knowledge Representation using Frames.

UNIT-III:

Expert System and Applications: Introduction, Phases in Building Expert Systems, Expert System Architecture, Expert Systems Vs Traditional Systems, Truth Maintenance Systems, Application of Expert Systems, List of Shells and Tools.

Uncertainty Measure - Probability Theory: Introduction, Probability Theory, Bayesian Belief Networks, Certainty Factor Theory, Dempster-Shafer Theory.

UNIT-IV:

Machine-Learning Paradigms: Introduction. Machine Learning Systems. Supervised and Unsupervised Learning. Inductive Learning. Learning Decision Trees (Text Book 2), Deductive Learning. Clustering, Support Vector Machines.

Artificial Neural Networks: Introduction, Artificial Neural Networks, Single-Layer Feed-Forward Networks, Multi-Layer Feed-Forward Networks, Radial-Basis Function

Networks, Design Issues of Artificial Neural Networks, Recurrent Networks.

UNIT-V:

Advanced Knowledge Representation Techniques: Case Grammars, Semantic Web Natural Language Processing: Introduction, Sentence Analysis Phases, Grammars and Parsers, Types of Parsers, Semantic Analysis, Universal Networking Knowledge.

TEXT BOOKS

1. Saroj Kaushik. Artificial Intelligence. Cengage Learning. 2011
2. Russell, Norvig: Artificial intelligence, A Modern Approach, Pearson Education, Second Edition. 2004

REFERENCE BOOK

1. Rich, Knight, Nair: Artificial intelligence, Tata McGraw Hill, Third Edition 2009.
2. Introduction to Artificial Intelligence by Eugene Charniak, Pearson.
3. Introduction to Artificial Intelligence and expert systems Dan W. Patterson. PHI.
4. Artificial Intelligence by George Fluger rearson fifthedition.

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

MOBILE COMPUTING - B67PE2

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

COURSE OBJECTIVES:

1. To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
2. To understand the typical mobile networking infrastructure through a popular GSM protocol
3. To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
4. To understand the database issues in mobile environments & data delivery models.
5. To understand the ad hoc networks and related concepts.
6. To understand the platforms and protocols used in mobile environment.

COURSE OUTCOMES:

1. Able to think and develop new mobile application.
2. Able to take any new technical issue related to this new paradigm and come up with a solution(s).
3. Able to develop new ad hoc network applications and/or algorithms/protocols.
4. Able to understand & develop any existing or new protocol related to mobile environment

UNIT-I:

Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.
GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT- II:

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11)
Mobile Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT- III:

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks. **Database Issues:** Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT- IV:

Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols

UNIT- V:

Mobile Adhoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery.

Protocols and Platforms for Mobile Computing: WAP, Bluetooth, XML, J2ME, Java Card, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, SecondEdition, 2009.
2. Raj Kamal, "Mobile Computing", Oxford University Press,2007, ISBN: 0195686772.

REFERENCE BOOKS

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, SecondEdition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
3. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing
4. Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, Oct 2004.

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MOBILE APPLICATION DEVELOPMENT - B67PE2

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

COURSE OBJECTIVES:

On completion of this course the students should be able to:

1. Design, implement and evaluate a User Interface for a mobile application using J2ME.
2. Create a small but realistic working mobile application for small computing devices.
3. Categorize the challenges posed by developing mobile applications and be able to propose and evaluate and select appropriate solutions.

COURSE OUTCOMES:

1. Able to build applications using J2ME.
2. Able to install MIDlet applications in real time devices such as mobile phones.
3. Able to use High Level Display and Low Level Display classes.
4. Able to create database Connectivity to the MIDlet.
5. Able to work on sessions.

UNIT-I:

J2ME Overview

Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices. Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants.

UNIT-II:

J2ME Architecture and Development Environment

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.

J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices.

UNIT-III:

Commands, Items, and Event Processing

J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling.

High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class.

Low-Level Display: Canvas:The Canvas, User Interactions, Graphics, Clipping Regions, Animation.

UNIT-IV:

Record Management System

Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining

Tables, Calculating Data, Grouping and Ordering Data, Subqueries, VIEWs.

UNIT-V:

Generic Connection Framework:The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

TEXT BOOKS

1. J2ME: The Complete Reference, James Keogh, Tata Mc Graw Hill.
2. Programming for Mobile and Remote Computers, G.T.Thampi, dreamtech press.

REFERENCE BOOKS

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004.
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009.
3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, A press, 2005.
4. Kicking Butt with MIDP and MSA: Creating Great Mobile Applications,1st edition,J.Knudsen, Pearson.

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DESIGN PATTERNS - B67PE2

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

COURSE OBJECTIVES:

1. Understand the design patterns that are common in software applications.
2. Understand how these patterns are related to Object Oriented design.

COURSE OUTCOMES:

1. Able to construct design patterns to solve designproblems.
2. Able to implement a case study on designing a document editor.
3. Able to implement Creational design patterns.
4. Able to implement Structural design patterns.
5. Able to implement Behavioral 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 .

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

UNIT-III:

Structural Pattern Part-I : Adapter, Bridge, Composite. Structural Pattern Part-II : Decorator, façade, Flyweight, Proxy.

UNIT-IV:

Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.
Behavioral Patterns Part-II : Mediator, Memento, Observer.

UNIT-V:

Behavioral Patterns Part-II (cont'd): State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns.

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-IBy Mark Grand, Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand, WileyDreamTech.
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,PearsonEducation.
6. Pattern Oriented Software Architecture, F.Buschmann & others, John Wiley & Sons.

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INFORMATION SECURITY - B67PE3

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

COURSE OBJECTIVES:

1. Explain the objectives of information security.
2. Explain the importance and application of each of confidentiality, integrity, authentication and availability.
3. Understand various cryptographic algorithms.
4. Understand the basic categories of threats to computers and networks.
5. Describe public-key cryptosystem.
6. Describe the enhancements made to IPv4 by IPSec.
7. Understand Intrusions and intrusion detection.
8. Discuss the fundamental ideas of public-key cryptography.
9. Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
10. Discuss Web security and Firewalls.

COURSE OUTCOMES:

1. Understand the difference between threats and attacks.
2. Know the KEY Elements and Logical Elements ofNetworks
3. Able to handle authentication algorithms.
4. Understand the Policies, Guideline and Framework of E-mail and IP Security.
5. Understand the Policies, Guideline and Framework of Web Security

UNIT-I:

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT-II:

Symmetric key Ciphers: Block Cipher principles & Algorithms(DES, AES, Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, Key distribution **Asymmetric key Ciphers:** Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman, ECC), Key Distribution.

UNIT-III:

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm **Authentication Applications:** Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.

UNIT-IV:

E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combines security associations, key management.

UNIT-V:

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls **Case Studies on Cryptography and security:** Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual Elections.

TEXT BOOKS

1. Cryptography and Network Security: William Stallings, Pearson Education, 4th Edition.
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 2nd Edition.

REFERENCE BOOKS

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition.
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM.Arthur Conklin, Greg White, TMH.
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning.
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.

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INFORMATION RETRIEVAL SYSTEMS - B67PE3

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

COURSE OBJECTIVES:

On completion of this course you should have gained a good understanding of the foundation concepts of information retrieval techniques and be able to apply these concepts into practice. Specifically, you should be able to:

1. To use different information retrieval techniques in various application areas.
2. To apply IR principles to locate relevant information from large collections of data.
3. To analyze performance of retrieval systems when dealing with unmanaged data sources.
4. To implement retrieval systems for web search tasks.

COURSE OUTCOMES:

1. Able to identify the Boolean retrieval and index construction.
2. Able to evaluate the taxonomy of different information retrieval models.
3. Able to analyze language models for information retrieval.
4. Analyze vector machines on documents and clustering.
5. Able to analyze web search basics and link analysis.

UNIT-I:

Boolean retrieval. The term vocabulary and postings lists. Dictionaries and tolerant retrieval. Index construction. Index compression.

UNIT-II:

Scoring, term weighting and the vector space model. Computing scores in a complete search system. Evaluation in information retrieval. Relevance feedback and query expansion.

UNIT-III:

XML retrieval. Probabilistic information retrieval. Language models for information retrieval. Text classification. Vector space classification.

UNIT-IV:

Support vector machines and machine learning on documents. Flat clustering. Hierarchical clustering. Matrix decompositions and latent semantic indexing.

UNIT-V:

Web search basics. Web crawling and indexes. Link analysis.

TEXTBOOKS

1. Introduction to Information Retrieval , Christopher D. Manning and Prabhakar.
2. Raghavan and Hinrich Schütze, Cambridge University Press, 2008.

REFERENCE BOOKS

1. Information Storage and Retrieval Systems: Theory and Implementation, Kowalski, Gerald, Mark T Maybury, Springer.
2. Modern Information Retrival , Ricardo Baeza-Yates, Pearson Education, 2007.
3. Information Retrieval: Algorithms and Heuristics, David A Grossman and Ophir Frieder, 2nd Edition, Springer, 2004.
4. Information Retrieval Data Structures and Algorithms, William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
5. Information Storage & Retieval , Robert Korfhage , John Wiley & Sons.

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DISTRIBUTED SYSTEMS - B67PE3

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

COURSE OBJECTIVES:

1. To understand what and why a distributed system is.
2. To understand theoretical concepts, namely, virtual time, agreement and consensus protocols.
3. To understand IPC, Group Communication & RPC Concepts.
4. To understand the DFS and DSM Concepts.
5. To understand the concepts of transaction in distributed environment and associated concepts, namely, concurrency control, deadlocks and error recovery.

COURSE OUTCOMES:

1. Understand basic concepts of a distributed system and sharing of resources in distributed manner.
2. Describe the theoretical concepts, namely, virtual time, agreement and consensus protocols.
3. Demonstrate the concepts of IPC, Group communication & RPC
4. Illustrating the methods of the DFS and DSMconcepts.
5. Understand the concepts of transaction in distributed environment and associated concept, namely, concurrency control, deadlocks and error recovery

UNIT- I:

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges. **System Models:** Introduction, Architectural Models, Fundamental Models.

UNIT- II:

Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging. **Coordination and Agreement:** Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

UNIT-III:

Inter Process Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT- IV:

Distributed File Systems: Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew FileSystem.

Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

Distributed Shared Memory: Introduction, Design and Implementation Issues, Sequential Consistency and IVY case study, Release Consistency, Munin Case Study, Other Consistency Models.

UNIT- V:

Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control. **Distributed Transactions:** Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery.

TEXT BOOK

1. Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, 4th Edition, 2009.

REFERENCE BOOKS

1. Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.
2. Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman & Hall/CRC, Taylor & Fransis Group, 2007.

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ADVANCED COMMUNICATION SKILLS LAB – BE23

B.Tech. VII Semester **L/T/P/C**
3/0/0/1.5

INTRODUCTION

A course on Advanced Communication Skills (ACS) Lab is considered essential at the third year level of B.Tech and B.Pharmacy courses. At this stage, the students need to prepare themselves for their career which requires them to listen to, read, speak and write in English both for their professional and interpersonal communication. The main purpose of this course is to prepare the students of Engineering for their placements.

COURSE OBJECTIVES:

1. To improve students' fluency in spoken English
2. To enable them to listen to English spoken at normal conversational speed
3. To help students develop their vocabulary
4. To read and comprehend texts in different contexts
5. To communicate their ideas relevantly and coherently in writing
6. To make students industry-ready
7. To help students acquire behavioral skills for their personal and professional life
8. To respond appropriately in different socio-cultural and professional contexts
9. To sensitize the importance of Soft Skills and people skills

COURSE OUTCOMES:

Students will be able to:

1. Acquire vocabulary and use it contextually
2. Listen and speak effectively
3. Develop proficiency in academic reading and writing
4. Increase possibilities of job prospects
5. Communicate confidently in formal and informal contexts
6. Develop interpersonal communication skills

Syllabus

The following course activities will be conducted as part of the Advanced English Communication Skills (AECS) Lab:

UNIT-I:

Inter-personal Communication and Building Vocabulary – Starting a Conversation – Responding Appropriately and Relevantly – Using Appropriate Body Language – Role Play in Different Situations – Synonyms and Antonyms, One-word Substitutes, Prefixes and Suffixes, Idioms and Phrases and Collocations.

UNIT-II:

Reading Skills and Group Discussion–General Vs Local Comprehension, Reading for Facts, Guessing Meanings from Context, Skimming, Scanning, Inferring Meaning and practice with different texts.

UNIT-III:

Writing Skills – Structure and Presentation of Different Types of Writing – Letter writing / Resume Writing/ e-correspondence/statement of purpose/ Technical Report Writing/Styles-Types-Report in Manuscript format.

UNIT-IV:

Group Discussion and Presentation Skills

Group Discussions-Dynamics of Group Discussion, Intervention, Summarizing, Modulation of Voice, Body Language, Relevance, Fluency and Organization of Ideas and Rubrics of Evaluation- Concept and Process.

Presentation Skills – Oral Presentations (individual or group) through JAM Sessions/Seminars/PPTs and Written Presentations through Posters/Projects/Reports/ emails/Assignment.

UNIT-V:

Interview Skills – Pre-interview Planning, Opening Strategies, Answering Strategies, Interview through Tele-conference & Video-conference and Mock Interviews.

Minimum Hardware Requirement

Advanced English Communication Skills (AECS) Laboratory shall have the following infrastructural facilities to accommodate at least 35 students in the lab:

Spacious room with appropriate acoustics

Eight round tables with five movable chairs for each table. Audio-visual aids

LCD Projector

Public Address system

Computer with suitable configuration

Suggested Software: The software consisting of the prescribed topics elaborated above should be procured and used.

Oxford Advanced Learner's Compass, 8th Edition

DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.

REFERENCE BOOKS:

1. Rizvi, M Ashraf. Effective Technical Communication. Mc Graw – Hill
2. Kumar, Sanjay and Pushp Lata. English for Effective Communication, OUP,2015
3. Konar, Nira. English Language Laboratories – A Comprehensive Manual, PHI Learning Pvt Ltd, 2011.
4. Shiv Khera, You can Win, Macmillan Books, New York, 2003.
5. Jeff Butterfield, Soft Skills for Everyone, Cengage Learning, 2015

T K R COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

NETWORK SECURITY - B67PE6

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

COURSE OBJECTIVES:

1. Understand the basic categories of threats to computers and networks
2. Understand various cryptographic algorithms.
3. Describe public-key cryptosystem.
4. Describe the enhancements made to IPv4 by IPSec
5. Understand Intrusions and intrusion detection
6. Discuss the fundamental ideas of public-key cryptography.
7. Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
8. Discuss Web security and Firewalls.

COURSE OUTCOMES:

1. Understand the difference between threats and attacks.
2. Know the KEY Elements and Logical Elements of Networks
3. Able to handle authentication algorithms.
4. Understand the Policies, Guideline and Framework of E-mail and IP Security.
5. Understand the Policies, Guideline and Framework of Web Security.

UNIT- I:

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT- II:

Symmetric key Ciphers: Block Cipher principles & Algorithms(DES, AES,Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, Key distribution Asymmetric key Ciphers: Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman,ECC), Key Distribution

UNIT – III:

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm Authentication Applications: Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication

UNIT – IV:

E-Mail Security: Pretty Good Privacy, S/MIME IP Security: IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, key management

UNIT – V:

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction Intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls Case Studies on **Cryptography and security:** Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual Elections.

TEXT BOOKS

1. Cryptography and Network Security : William Stallings, Pearson Education,5th Edition
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 2nd Edition.
3. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

REFERENCE BOOKS

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Sceurity: WM.Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGELearning.
6. Principles of Information security by Michael E Whitman and Herbert J.Mattord

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

NEURAL NETWORKS - B67PE6

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

COURSE OBJECTIVES:

1. Basic neuron models: McCulloch-Pitts model and the generalized one, distance or similarity based neuron model, radial basis function model, etc.
2. Basic neural network models: multilayer perceptron, distance or similarity based neural networks, associative memory and self-organizing feature map, radial basis function based multilayer perceptron, neural network decision trees, etc.
3. Basic learning algorithms: the delta learning rule, the back propagation algorithm, self-organization learning, the r4-rule, etc.
4. Applications: pattern recognition, function approximation, information visualization, etc.

COURSE OUTCOMES:

1. Able to understand and apply learning techniques.
2. Able to implement various algorithms for propagation, clustering and regression.
3. Ability to implement various algorithms for radial basis networks.
4. Able to understand various network based competitions.
5. Able to implement various algorithms for patternassociation.

UNIT-I:

Biological Neurons and Neural Networks, Basic Structures and Properties of Artificial Neural Networks, Basic Neuron Models-McCulloch-Pitts -Nearest Neighbor- Radial Basis Function, Activation Functions ,Singe Layer Perceptrons- Linear Seperability, Learning and Generalization in Single Layer Perceptron-Hebbian Learning-Gradient Descent Learning Widrow-Hoff Learning-The Generalized Delta rule, Practical Considerations

UNIT- II:

Multi Layer Perceptron Learning,Back Propogation Algorithim -Applications – Limitations–Network Paralysis – Local Minima – Temporal Instability, Pattern Analysis Tasks- Classification-Regression- Clustering, Pattern Classification and Regression using Multilayer Perceptron.

UNIT-III:

Radial Basis Function Networks: Fundamentals, Algorithms and Applications, Learning with Momentum, Conjugate Gradient Learning, Bias and Variance. Under- Fitting and Over Fitting, Stochastic neural networks, Boltzmann machine.

UNIT-IV:

Network based on competition:- Fixed weight competitive Network-Maxnet, Mexican Hat and Hamming Net, Counter Propagation Networks- Kohonen's self- organizing map – Training the Kohonen layer – Training the Grossberg layer – Full counter propagation network – Application, Adaptive resonance theory – classification- Architecture – Learning and generalization.

UNIT-V:

Pattern Association: - training algorithm for pattern association - Hetro Associative Network, Auto Associative Network, Architecture of Hopfield nets – stability analysis, General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM training algorithms.

TEXT BOOKS

1. Simon Haykin, Neural Networks, 2/e, Prentice Hall

REFERENCES

1. B. Yegnanarayana, "Artificial Neural Networks", PHI.
2. Neural Computing & Practice – Philip D. Wass
3. Neural Networks in Computer Intelligence-Limin Fu,Tata Mc.Hill Edition

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

WIRELESS SENSOR NETWORKS - B67PE6

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

COURSE OBJECTIVES:

1. To Understand the basic WSN technology and supporting protocols, with emphasis placed on standardization basic sensor systems and provide a survey of sensor technology
2. Understand the medium access control protocols and address physical layer issues
3. Learn key routing protocols for sensor networks and main design issues
4. Learn transport layer protocols for sensor networks, and design requirements
5. Understand the fundamentals and challenges of network security.

COURSE OUTCOMES:

1. Able to implement and deploy wireless sensor networks.
2. To discuss the challenges in designing MAC, routing and transport protocols for wireless sensor networks.
3. To discuss the challenges in designing routing and transport protocols for wireless sensor networks.
4. Able to design ranging techniques.
5. To explain various security threats to networks and describe proposed solutions

UNIT-I:

Introduction: Components of a wireless sensor node, Motivation for a Network of Wireless Sensor Nodes, Classification of sensor networks, Characteristics of wireless sensor networks, Challenges of wireless sensor networks, Comparison between wireless sensor networks and wireless mesh networks, Limitations in wireless sensor networks, Design challenges, Hardware architecture, Applications : Structural Health Monitoring, Traffic Control, Health Care, .Pipeline Monitoring, Precision Agriculture, Active Volcano, Underground Mining Node Architecture: The Sensing Subsystem, the Processor Subsystem, Communication Interfaces, Prototypes. Operating Systems: Functional Aspects, Nonfunctional Aspects, Prototypes, Evaluation

UNIT- II:

Basic Architectural Framework: Physical Layer, Basic Components, Source Encoding, Channel Encoding, Modulation Medium Access Control: Wireless MAC Protocols, Characteristics of MAC Protocols in Sensor Networks, Contention-Free MAC Protocols, Contention-Based MAC Protocols, Hybrid MAC Protocols

UNIT-III:

Network Layer: Routing Metrics, Flooding and Gossiping, Data-Centric Routing, Proactive Routing, On-Demand Routing, Hierarchical Routing, Location-Based Routing, QoS-Based Routing Protocols Node and Network Management: Power Management, Local Power Management aspects, Dynamic Power Management, Conceptual Architecture

UNIT- IV:

Time Synchronization: Clocks and the Synchronization Problem, Time Synchronization in Wireless Sensor Networks, Basics of Time Synchronization, Time Synchronization Protocols Localization: Ranging Techniques, Range-Based Localization, Range-Free Localization, EventDriven Localization.

UNIT-V:

Security: Fundamentals of Network Security, Challenges of Security in Wireless Sensor Networks , Security Attacks in Sensor Networks, Protocols and Mechanisms for Security, IEEE 802.15.4 and Zig Bee Security

TEXT BOOKS

1. Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice", Wiley 2010
2. Mohammad S. Obaidat, Sudip Misra, "Principles of Wireless Sensor Networks", Cambridge, 2014

REFERENCE BOOKS

1. Ian F. Akyildiz, Mehmet Can Vuran , "Wireless Sensor Networks", Wiley 2010
2. C S Raghavendra, K M Sivalingam, Taieb Znati, "Wireless Sensor Networks", Springer, 2010
3. C. Sivarm murthy & B.S. Manoj, "Adhoc Wireless Networks", PHI-2004
4. FEI HU., XIAOJUN CAO, "Wireless Sensor Networks", CRC Press, 2013
5. Feng ZHAO, Leonidas GUIBAS, " Wireless Sensor Networks", ELSEVIER , 2004

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18
BIG DATA ANALYTICS - B68PE2

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

COURSE OBJECTIVES:
1. To introduce the terminology, technology and its applications
2. To introduce the concept of Analytics for Business
3. To introduce the tools, technologies & programming languages which is used in day to day analytics cycle.

COURSE OUTCOMES:
1. Able to design data architecture and manage, export the data on to the cloud with secure and safe working environment.
2. Ability to implement various big data tools to identify gaps in the data.
3. Ability to run the analyzed data on various environments.
4. Able to implement various machine learning algorithms.
5. Able to implement various data visualization tools.

UNIT- I:
Data Management (NOS 2101): Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/signal/GPS etc. Data Management, Data Quality (noise, outliers, missing values, duplicate data) and Data Preprocessing. Export all the data onto Cloud ex. AWS/Rackspace etc.
Maintain Healthy, Safe & Secure Working Environment (NOS 9003) Introduction, workplace safety, Report Accidents & Emergencies, Protect health & safety as your work**,** course conclusion, assessment.

UNIT- II:
Big Data Tools (NOS 2101): Introduction to Big Data tools like Hadoop, Spark, Impala etc., Data ETL process, Identify gaps in the data and follow-up for decision making.
Provide Data/Information in Standard Formats (NOS 9004)
Introduction, Knowledge Management, Standardized reporting & compliances, Decision Models, course conclusion. Assessment

UNIT- III:
Big Data Analytics: Run descriptives to understand the nature of the available data, collate all the data sources to suffice business requirement, Run descriptive statistics for all the variables and observer the data ranges, Outlier detection and elimination.

UNIT- IV:
Machine Learning Algorithms (NOS 9003): Hypothesis testing and determining the multiple analytical methodologies, Train Model on 2/3 sample data using various Statistical/Machine learning algorithms, Test model on 1/3 sample for prediction etc.

UNIT-V:
(NOS 9004) Data Visualization (NOS 2101): Prepare the data for Visualization, Use tools like Tableau, Qlick View and D3, Draw insights out of Visualization tool. Product Implementation

TEXT BOOK

1. Student's Handbook for Associate Analytics.

REFERENCE BOOKS

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley, 2006
2. Data Mining Analysis and Concepts, M. Zaki and W. Meira (the authors have kindly made an online version available): http://www.dataminingbook.info/uploads/book.pdf
3. Mining of Massive Datasets Jure Leskovec Stanford Univ. Anand Rajaraman Milliway Labs Jeffrey D.Ullman, Stanford Univ. (http://www.vistrails.org/index.php/Course:_Big_Data_Analysis)

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

SEMANTIC WEB AND SOCIAL NETWORKS - B68PE2

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

COURSE OBJECTIVES:

1. To learn Web Intelligence
2. To learn Knowledge Representation for the SemanticWeb
3. To learn Ontology Engineering
4. To learn Semantic Web Applications, Services and Technology
5. To learn Social Network Analysis and semantic web.

COURSE OUTCOMES:

1. Able to design Web intelligence.
2. Able to design ontologies and resource description frameworks.
3. Able to construct ontology methods.
4. Ability to design web applications
5. Gain knowledge on social networks.

UNIT-I:

Web Intelligence: Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT-II:

Knowledge Representation for the Semantic Web: Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

UNIT- III:

Ontology Engineering: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT-IV:

Semantic Web Applications, Services and Technology: Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT- V:

Social Network Analysis and semantic web: What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

TEXT BOOKS

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley inter science, 2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J. Davies, R. Studer, P. Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T. Segaran, C.Evans, J. Taylor, O'Reilly, SPD.

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DEPARTMENT OF INFORMATION TECHNOLOGY -R18

DISTRIBUTED DATABASES - B68PE2

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

COURSE OBJECTIVES:

This course will introduce principles and foundations of distributed databases, including architecture, design issues, integrity control, query processing and optimization, transactions, and concurrency control.

COURSE OUTCOMES:

1. Able to implement transformation techniques.
2. Ability to handle various transactions.
3. To discuss distributed concurrency control based on the distinguished copy techniques.
4. Able to handle issues in the architectures.
5. Able to learn database recovery techniques.

UNIT-I:

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases. Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT-II:

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT-III:

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT-IV:

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution , Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

UNIT-V:

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies.

TEXTBOOKS

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

REFERENCE BOOKS

1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez – Pearson Education.