Centre for Artificial Intelligence
DATA MINING & WAREHOUSING (OC-1)

COURSE OBJECTIVES

- To understand the significance of data mining in a real-world perspective. and gain the understanding of data mining techniques, algorithms and commonly used tools.
- To develop the ability for applying data mining techniques and tools for solving real-world problems.

Unit I

Introduction: Motivation, importance, Data types for Data Mining: Relational Databases, Data Ware-Houses. Transactional Databases, Advanced Database System and Its Applications, Data Mining Functionalities, Concept/Class Description, Association Analysis Classification & Prediction, Cluster Analysis, Outlier Analysis, Classification of Data Mining Systems, Major Issues in Data Mining.

Unit II

Data Pre-processing: Data Cleaning, Data Integration and Transformation and Data Reduction. Discretization and Concept Hierarchy Generation. Data Mining Primitives Languages and System Architectures, Concept Description, Characterization and Comparison Analytical, Characterization. Data Warehouse and OLTP Technology for Data Mining: Differences between Operational Database Systems & Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology

Unit III

Mining Association Rules in Large Databases: Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single Dimensional Boolean Association Rules from Transactional Databases: The Apriori Algorithm, Generating Association Rules from Frequent Items, Improving the Efficiency of Apriori, other Algorithms & their Comparison, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint Based Association Rule Mining.

Unit IV

Classification & Prediction and Cluster Analysis: Issues Regarding Classification & Prediction, Different Classification Methods, Prediction, Cluster Analysis, Major Clustering Methods, Currently Available Tools.

Unit V

Introduction to data warehousing, need and significance, challenges & issues in warehousing, difference between data mining & warehousing, case studies- stock market, supermarket etc. , implementation of current applications involving data mining.

RECOMMENDED BOOKS:

1. Data Mining: Concepts and Techniques, Han and Kamber, Morgan Kaufmann Publications.
2. Data Mining Techniques, A. K. Pujari, Universities Press Pvt. Ltd.
3. Data Warehousing in the Real World, Sam Anahory, Pearson Publication.

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COURSE OUTCOMES

After completing the course, the student will be able to:

CO1: explain fundamental concepts of data mining and data warehousing.

CO2: classify database systems and data models of data warehouses.

CO3: compare methods for storing & retrieving data from different data sources.

CO4: apply data mining techniques for knowledge extraction from large amounts of data.

CO5: predict trends to make informed decisions.

CO6: develop real world applications using data mining techniques.

CO-PO Mapping Matrix														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	2	2	2	1	1	1	1	3	1	1
CO2	3	3	3	3	3	3	2	1	1	2	1	3	2	2
CO3	3	3	3	3	3	3	2	2	2	1	2	3	2	2
CO4	3	3	3	3	3	3	3	3	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	2	2	2	3	3	3
CO6	3	3	3	3	3	3	3	3	3	2	3	3	3	3

Centre for Artificial Intelligence
INFORMATION SECURITY (OC-1)

COURSE OBJECTIVES

- To provide conceptual understanding of information security principles, issues, challenges and mechanisms.
- To understand encryption techniques for securing data in transit across data networks.

Unit-I

Security: Principles and Attacks, Basic Number Theory, Fundamentals of Cryptography, Steganography, Cryptanalysis, Code Breaking, Block Ciphers and Steam Ciphers, Substitution Ciphers, Transposition Ciphers, Caesar Cipher, Play-Fair Cipher, Hill Cipher

Unit-II

Cryptography: Symmetric Key Cryptography, Public Key Cryptography, Principles of Public Key Cryptosystem, Classical Cryptographic Algorithms: RC4, RSA, Distribution of Public Keys and Key Management, Diffie-Hellman Key Exchange.

Unit-III

Hash Functions: Hash Functions, One Way Hash Function, SHA (Secure Hash Algorithm). Authentication: Requirements, Functions, Kerberos, Message Authentication Codes, Digital Signatures, Digital Certificates.

Unit -IV

IP Web Security Overview: SSL (Secure Socket Layer), TLS (Transport Layer Security), SET (Secure Electronic Transaction). IDS (Intrusion detection system), Firewalls: Types, Functionality and Polices.

Unit -V

Phishing: Attacks and its Types, Buffer Overflow Attack, Session Hijacking, Hacker: Hacking and Types of Hackers, FootPrinting, Scanning: Types: Port, Network, Vulnerability), Sniffing in Shared and Switched Networks, Sniffing Detection Prevention, Spoofing.

RECOMMENDED BOOKS

1. Cryptography and Network Security, William Stallings, Pearson Education.
2. Cryptography and Network Security, Atul Kahate, McGraw Hill Education.
3. Incident Response and Computer Forensics, Kevin Mandia, Chris Prosise, Tata McGraw Hill.

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COURSE OUTCOMES

After completion of the course students would be able to:

CO1: determine symmetric and public key cryptography, classical algorithms, and basic number theory.

CO2: explain the working of various cryptographic algorithms.

CO3. apply firewall, IDS, and security protocols like SSL, TLS, and SET.

CO4: build secure systems using digital signatures, message authentication, and certificates.

CO5: examine the strengths and weaknesses of IP and web security.

CO6: select strategies for detecting and preventing attacks like sniffing, spoofing, and hacking.

CO-PO Mapping Matrix														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	2	3	1			1	1	2	2	3	2
CO2	3	3	2	2	3				1	1	2	2	3	2
CO3	3	3	3	2	3	1	1	1	2	2	2	3	3	3
CO4	3	3	3	3	3	2		1	1	2	2	3	3	3
CO5	3	3	2	2	3	2	1	1		2	2	3	3	3
CO6	3	3	3	3	3	3	1	1	1	2	3	3	3	3