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| **Course – 64 Title: Data Warehousing and Mining** |  |
| **Course No.: CCE - 417 Credit : 3 Contact Hours: 3** | **Total Marks: 100** |

**11.1 Rationale:**

A computer engineer needs to identify and classify the main issues and solve the challenges facing different business organizations when implementing Data Warehouse (DW) technologies

**11.2 Objectives:**

* Interpret the contribution of data warehousing and data mining to the decision support level of organizations
* Evaluate different models used for OLAP and data pre-processing
* Categorize and carefully differentiate between situations for applying different data mining techniques: mining frequent pattern, association, correlation, classification, prediction, and cluster analysis
* Design and implement systems for data mining
* Evaluate the performance of different data mining algorithms
* Propose data mining solutions for different applications

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| **11.3**  **Learning Outcomes** | **11.4**  **Course Content** | **11.5**  **Teaching  Learning Strategy** | **11.6 Assessment Strategy** |
| * Definerelation Databases, Data Warehouses, Transactional databases, advanced database system * Differentiate amongrelation Databases, Data Warehouses, Transactional databases | **Motivation, importance, Data type for Data Mining:** relation Databases, Data Warehouses, Transactional databases, advanced database system and its applications | Lecture | Essay, Short answer, Questionnaire |
| * Explain Concept/Class description, Association Analysis classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis * Classify data mining systems | **Data mining Functionalities:** Concept/Class description, Association Analysis classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems | Lecture | Identification, Essay, Short answer, Questionnaire |
| * Compare between Operational Database Systems and Data Warehouses and evaluate which one is best * Describe multidimensional data model * Construct n-dimensional data cube * Illustrate data warehouse architecture * Summarize data warehouse implementation process | **Data Warehouse and OLAP Technology for Data Mining:** Differences between Operational Database Systems and Data Warehouses, a multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology | Lecture, Demonstration  (Introducing necessary tools) | Exercise, Essay, Short answer, Questionnaire |
| * Introduces techniques for preprocessing data before mining * Generate concept hierarchy | **Data Preprocessing:** Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Languages, and System Architectures, Concept Description: Characterization and Comparison, Analytical Characterization | Lecture | Assignment, Exercise, Essay, Short answer, Questionnaire |
| * DevelopSingle-Dimensional Boolean Association Rules from Transactional Databases * ConstructMultilevel Association Rules, Multidimensional Association Rules * Explain constraint- based association mining | **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 Apriory, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint-Based Association Mining | Lecture, Exercise | Assignment, Exercise, Essay, Short answer, Questionnaire |
| * Explain classification and prediction * Differentiate among different classification methods * Name major clustering methods | **Classification & Prediction and Cluster Analysis:** Issues regarding classification & prediction, Different Classification Methods, Prediction, Cluster Analysis, Major Clustering Methods | Lecture | Essay, Short answer, Questionnaire |
| * Find some application areas trend of data mining * Characterize and learn to use some of the currently available tools | **Applications & Trends in Data Mining:** Data Mining Applications, currently available tools | Lecture | Essay, Short answer, Questionnaire |

**RECOMMENDED BOOKS AND PERIODICALS**

**Text Books**:

1. J. Han and M. Kamber, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Pub.

2. Berson “Dataware housing, Data Mining & DLAP, @004, TMH.

3. W.H. Inmon “ Building the Datawarehouse, 3ed, Wiley India.

4. Anahory, “Data Warehousing in Real World”, Pearson Education.

5. Adriaans, “Data Mining”, Pearson Education.

6. S.K. Pujari, “Data Mining Techniques”, University Press, Hyderabad.