**JSPM Narhe Technical Campus**

**Department: MCA**

**Academic Year –2021-22**

**Teaching, Learning and Assessment tool Plan**

**Name of Faculty: - Prof. A.M.Tekale Subject:-Data warehousing and data mining**

**Semester: III Year:2021 - 2022 Division: A Planned Duration: 42Hr**

**Course outcome:**

CO1: Understand Data warehouse concepts, architecture and models (Understand)

CO2: Learn and understand techniques of preprocessing on various kinds of data (Understand)

CO3: Apply association Mining and Classification Techniques on Data Sets (Apply)

CO4: Apply Clustering Techniques and Web Mining on Data Sets (Apply)

CO5: Understand other approaches of Data mining (Understand)

**Unit - 1 Data Warehouse Fundamentals**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Syllabus structure and Co conveyed to studentsIntroduction to Data Warehouse,OLTP Systems; | 17-11-21 |  | CO-1 | Inductive thinking & concept attainment Model | Direct instructions | Notes | R-1 | Reading Notes | Notes | Feedback |
| 2 | Differences between OLTP Systems and Data WarehouseCharacteristics of Data Warehouse; | 18-11-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | Reading Notes | Notes | Feedback |
| 3 | Functionality of Data Warehouse Advantages and Applications of Data Warehouse | 19-11-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | Reading Notes | Notes,Assignments | Feedback |
| 4 | Top- Down and Bottom-Up Development Methodology: | 24-11-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | Reading Notes | Notes,Assignments | Feedback |
| 5 | Tools for Data warehouse dev | 25-11-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | R-2 | Reading Notes | Notes,Assignments | Feedback |
| 6 | Data Warehouse TypesPlanning and Project Management in constructing Data warehouse | 26-11-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | Reading Notes | Notes,Assignments | Feedback |
| 7 | Data Warehouse Project management | 01-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | Reading Notes | Notes,Assignments | Feedback |
| 8 | Data Warehouse development Life Cycle, Kimball Lifecycle Diagram | 02-12-21 |  |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | Reading Notes | Notes,Assignments | Feedback |

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| **Unit - 2 - Data Warehouse Architecture** | | | | | | | | | | | |
| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Introductions, Components of Data warehouse Architecture | 03-12-21 |  | CO-2 | Inductive thinking & concept attainment Model | Direct instructions | Notes, | R-3 | Reading Notes | Notes,Assignments | Feedback |
| 2 | Technical Architectures; Federated Data Warehouse Architecture: Tool selection; | 08-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 3 | Dimensional Modeling: E-R Modeling VS Dimensional Modeling | 09-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 4 | Star Schema, Inside Dimensional Table, Inside Fact Table, Fact Less Fact Table, Granularity | 10-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 5 | Star Schema Keys: Snowflake Fact Constellation SchemaIntroduction to Metadata : Categorizing Metadata | 15-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 6 | Metadata management in practice; Meta data requirements gathering, Metadata classification, | 16-12-21 |  | Inductive thinking & concept attai | Direct instructions | Notes, | Reading Notes | Notes | Feedback |
| 7 | Meta data collection strategies, Tools for Metadata Management | 17-12-21 |  |  | Inductive thinking & concept attainment Model | Direct instructions | Notes |  | Reading Notes | Notes,Assignments | Feedback |

**Unit - 3 - Data Preprocessing and ETL**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Data Pre-processing: Data Cleaning tasksData Integration and Data Reduction | 22-12-21 |  | CO-3 | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | R-4 | Reading Notes | Notes | Feedback |
| 2 | Discretization and Concept Hierarchy Generation Data Transformation; Basic Tasks in Transformation | 23-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 3 | Major Data Transformation TypesIntroduction to ETL(Extract, Transform and Load) ETL requirements and steps: Data Extraction; | 24-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 4 | Extraction Methods, Logical Extraction Methods, Physical Extraction Methods | 29-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Notes,Assignments | Feedback |
| 5 | Data loading; Data Loading Techniques, ETL Tools | 30-12-21 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Notes,Assignments | Feedback |

**Unit - 4 - Data Warehouse & OLAP**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Introduction: What is OLAP?; Characteristics of OLAP | 31-12-21 |  | CO-4 | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | R-4 | Reading Notes | Notes | Feedback |
| 2 | Steps in the OLAP Creation Process, OLAP operations | 05-01-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 3 | Advantages of OLAP: Multidimensional Data:OLAP Architectures | 06-01-22 |  | Inductive thinking & conceptattain. | Direct instructions | Notes, youtube Videos | Reading Notes | Notes,Assignments | Feedback |
| 4 | MOLAP, ROLAP, HOLAP | 07-01-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Notes,Assignments | Feedback |
| 5 | Data Warehouse and OLAP: Hypercube & Multicubes | 12-01-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes, youtube Videos | Notes,Assignments | Feedback |

**Unit - 5 - Introduction to Data Mining**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Introduction and Scope of Data Mining , How does Data Mining Works, Predictive Modeling | 13-01-22 |  | CO-5 | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | R-3 | Reading Notes | Notes,Assignments | Feedback |
| 2 | Data Mining and Data Warehousing, | 14-01-22 |  | Inductive thinking & concept attain. | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 3 | Architecture for Data Mining | 26-01-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 4 | Profitable Applications: Data Mining Tools: | 27-01-22 |  |  | Inductive thinking & concept attainment Model | Direct instructions | Notes | R-3 | Reading Notes | Notes,Assignments | Feedback |

**Unit - 6 - Data Mining Techniques**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | An Overview: Introduction, Data Mining, Data Mining Versus Database Management System | 28-01-22 |  | CO-5 | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | R-4 | Reading Notes | Notes,Assignments | Feedback |
| 2 | Data Mining Techniques- Association rules( Apriori, FP Tree algorithms) | 02-02-22 |  | Inductive thinking & concept attain. | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 3 | Profitable Applications: Data Mining Tools: | 03-02-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 4 | Clustering, Neural networks. | 04-02-22 |  | Inductive thinking & concept attain. | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 5 | Evaluating Association rules , Classification model | 09-02-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |

**Unit - 7 - Clustering**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Introduction to Clustering, Cluster Analysis, Clustering Methods- K means | 10-02-22 |  | CO-5 | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | R-5 | Reading Notes | Notes,Assignments | Feedback |
| 2 | Hierarchical clustering, Agglomerative clustering | 11-02-22 |  | Inductive thinking & concept attain. | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 3 | Divisive clustering, clustering and segmentation software | 16-02-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 4 | Evaluating clusters, Data Mining trends and Application | 17-02-22 |  | Inductive thinking & concept attain. | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |

**Unit - 8 - Web Mining**

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| Sr. No | Content | Planned Date | Actual Date | Course outcome to fulfill | Teaching model | Teaching activity | Teaching material | References | Student activity | Student Learning material | Assessment tool |
| 1 | Introduction, Terminologies Categories of Web Mining: Web Content Mining, | 18-02-22 |  | CO-4 | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | R-5 | Reading Notes | Notes,Assignments | Feedback |
| 2 | Web Structure Mining, Web Usage Mining, Applications of Web Mining, Agent based and Database approaches, Web mining Software/Tools | 23-02-22 |  | Inductive thinking & concept attain.Model | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 3 | Text Mining: process and types, steps in Text Mining, applications and tools of Text Mining | 25-02-22 |  | Inductive thinking & concept attainment Model | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |
| 4 | Data visualization, Dashboard- KPI, Business Intelligence and its future | 02-03-22 |  | Inductive thinking & concept attain. | Direct instructions | Notes,online tutorial | Reading Notes | Notes,Assignments | Feedback |

Name and Signature: Faculty Program Coordinator HOD

Role: (Prepared By) (Reviewed by) (Approved by)

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Copy To: (Soft copy of Signed document be provided)

1. Program Coordinator
2. Website coordinator

Reference Books:

1. DATAWAREHOUSING FUNDAMENTALS: A COMPREHENSIVE GUIDE FOR IT PROFESSIONALS, by Paulraj Poonniah, Latest Edition

2. Building the Data Warehouse, 3rd edition by W. H. Inmon

3. Data Mining concepts and Techniques by Jiawei Han, Micheline Kambler – Elsevier.

4. Data Mining practical Machine Learning Tools and Techniques by Ian H. Witten Eibe Frank Mark Hall - Elsevier publication

5. Introduction to Data Mining with Case Studies by G. K. Gupta, Prentice Hall

Web Reference:

1. [www.ibm.com/in/en/](http://www.ibm.com/in/en/)

2. [www.pentaho.com/](http://www.pentaho.com/)

3. [www.jaspersoft.com/](http://www.jaspersoft.com/)

4. [www.amazon.com/Data-Mining-Business-Intelligence-Applications](http://www.amazon.com/Data-Mining-Business-Intelligence-Applications)

5. [www.ibm.com/insights/in](http://www.ibm.com/insights/in)

6. [www.sas.com](http://www.sas.com)

7. Weka– Data Mining with Open Source Machine Learning Software, [www.cs.waikato.ac.nz/ml/weka](http://www.cs.waikato.ac.nz/ml/weka).

8. <https://cloud.google.com/bigquery/>

9. <https://www.rstudio.com/>

10.https://aws.amazon.com/redshift/