Subject Code: 01ME0722
Subject Name: Data Mining and Analysis
B. Tech. Year - IIII (Semester - 7)

Type of course : Under Graduate

Prerequisite : None

Rationale : Understanding the Data preprocessing techniques and implementation of predictive, diagnosis advanced data analytics technique in manufacturing

Course Outcome :

1. Understand the basic concept of Data Mining
2. Application of Data mining in production planning and control
3. Application of Data mining in manufacturing Processes
4. Analyzing data mining in PPC and manufacturing processes
5. Evaluate data mining in PPC and manufacturing processes

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Teaching and Examination Scheme :

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks			Practical Marks		
Theory	Tutorial	Practical	C	ESE(E)	IA	CSE	Viva (V)	Term Work (TW)	
4	0	2	5	50	30	20	25	25	150

Content :

22

Sr. No.	Content	Total Hrs
1	**Introduction to Data Mining:** Introduction to Big Data and Data Science type, type of data , Current Landscape of perspective, Machine learning algorithm, Data Mining tools	4
2	**Data Mining in Engineering Design** Basic concept of engineering design, Data Mining in selection of components, product specification, assembly data product cost etc, Knowledge acquitting in design from the data obtained through observing design activities using CAD system, Data Mining in feedback from life cycle data, Data Mining in Product Development	10
3	**Data Mining in Manufacturing Processes** Data collection methods, Reliability of data, Association of process parameter and product quality, Application of machine learning algorithm	10
4	**Data Mining in Production Planning and Control** Data mining in effective utilization of resources, Data mining in cell manufacturing, Data mining in scheduling, Data mining in layout generation	10

5	**Data mining in Maintenance** Data acquisition for Maintenance, Data mining for forecasting components inventory, Data mining for Predictive, Autonomous, Preventive and Breakdown maintenance	**8**

Distribution of Theory Marks

R Level	**U** Level	**A** Level	**N** Level	**E`** Level	**C** Level
10	**20**	**25**	**25**	**10**	**10**

Legends: R: Remember**; U:** Understand**; A:** Apply**; N:** Analyze**; E:** Evaluate**; C**: Create

List of Experiments :

1. Case study on application of data mining in casting industry
2. Case study on application of data mining in fabrication industry
3. Case study on application of data mining in machining industry
4. Case study on application of data mining in forming industry
5. Case study on application of data mining in quality control
6. Case study on application of data mining in production planning
7. Case study on application of data mining in maintenance

Design based Examples (DE)/Open Ended Example :

1. Identify the key process parameter of manufacturing processes and implement any one predicative and diagnosis method

Reference Books :

1. Data Mining: Practical Machine Learning Tools and Technique by Witten, Ian H. Morgan Kaufmann Publishers
2. TensorFlow Machine Learning Cookbook by McClure, Nick, Packt Publishing Ltd
3. Concise Introduction to Machine Learning by Faul, A.C. CRC Press
4. Machine Learning by Mitchell, Tom M, McGraw Hill Education(India) Private Limited.
5. Pattern Recognition and Machine Learning by Bishop, Christopher M. Springer Science
6. Statistics and Data Analysis: from elementary to intermediate by Tamhane, Ajit C. | Dunlop, Dorothy D Prentice Hall, Inc.
7. Data Mining: concepts and techniques, 2nd ed by Han, Jiawei | Kamber, Micheline
8. Business Analytics: the science of data-driven decision making by Kumar, U. Dinesh Wiley India Pvt. Ltd
9. Data Analysis for Physical Scientists: featuring excel, 2nd ed by Kirkup, Les Cambridge University Press
10. Data Mining Methods and Techniques by Ali, A B M Shawkat | Wasimi, Saleh A Cengage Learning India Private Limited

List of Open Base Software/learning website :

1. https://www.anaconda.com/
2. https://www.python.org/
3. https://colab.research.google.com/
4. https://www.iitk.ac.in/ee/data-mining-lab/