

**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA,
BHOPAL**

New Scheme Based On AICTE Flexible Curricula

CSE-Artificial Intelligence and Machine Learning/ Artificial Intelligence and Machine Learning, VII-Semester

AL 702(D) Machine Learning for Data Science

Course Objective: The students will be able to derive practical solutions using predictive analytics. They will also understand the importance of various algorithms in Data Science.

Detailed Contents:

Unit I: Introduction

Algorithms and Machine Learning, Introduction to algorithms, Tools to analyze algorithms, Algorithmic techniques: Divide and Conquer, examples, Randomization, Applications

Unit II: Algorithms

Graphs, maps, Map searching, Application of algorithms: stable marriages example, Dictionaries and hashing, search trees, Dynamic programming

Unit III: Application to Personal Genomics

Linear Programming, NP completeness, Introduction to personal Genomics, Massive Raw data in Genomics, Data science on Personal Genomes, Interconnectedness on Personal Genomes, Case studies

Unit IV: Machine Learning

Introduction, Classification, Linear Classification, Ensemble Classifiers, Model Selection, Cross Validation, Holdout

Unit V: Machine Learning Applications

Probabilistic modelling, Topic modelling, Probabilistic Inference, Application: prediction of preterm birth, Data description and preparation, Relationship between machine learning and statistics

Text Books/Suggested References:

1. Introduction to Machine Learning, Jeeva Jose, Khanna Book Publishing House.
2. Machine Learning, Rajiv Chopra, Khanna Book Publishing House.
3. Data Science and Machine Learning: Mathematical and Statistical Methods Machine Learning & Pattern Recognition, by Dirk P. Kroese, Zdravko Botev, Thomas Taimre, Radislav Vaisman, Chapman & Hall/Crc, 2019.
4. Hands-On Data Science and Python Machine Learning, Frank Kane, Packt Publishers, 2017.
5. <https://www.edx.org/course/machine-learning-for-data-science-and-analytics>
6. Dr. Nageswara Rao, "Machine Learning in Data Science Using Python", Publisher by Dreamtech, 2022

Course Outcomes: After completion of course, students would be able to:

1. Apply practical solutions using predictive analytics.
2. Understand the importance of various algorithms in Data Science.
3. Create competitive advantage from both structured and unstructured data.
4. Predict outcomes with supervised machine learning techniques.
5. Unearth patterns in customer behavior with unsupervised techniques