MACHINE LEARNING

Course Outcomes

and

Syllabus

Course Outcomes

- **CO1:** Understand the fundamental concepts of machine learning
- **CO2:** Apply linear, distance based, and decision tree based models
- **CO3:** Analyze probabilistic, neural network models
- **CO4:** Design a suitable machine learning model for a given scenario

Syllabus

- **Unit I**

The ingredients of machine learning: Tasks, Models, Features
Binary classification and related tasks: Classification, Assessing classification performance, Visualising classification performance
Beyond binary classification: Multi-class classification, Regression

- **Unit II**

Decision Tree learning – Introduction, Decision tree representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Inductive bias in decision tree, Issues in decision tree learning.
Linear models: The least-squares method, Multivariate linear regression, Support vector machines, Soft margin SVM, Going beyond linearity with kernel methods.

Syllabus

- **Unit III**

Distance Based Models: Introduction, Nearest Neighbours classification, Distance based clustering, K-Means algorithms, Clustering around medoids, Hierarchical Clustering.

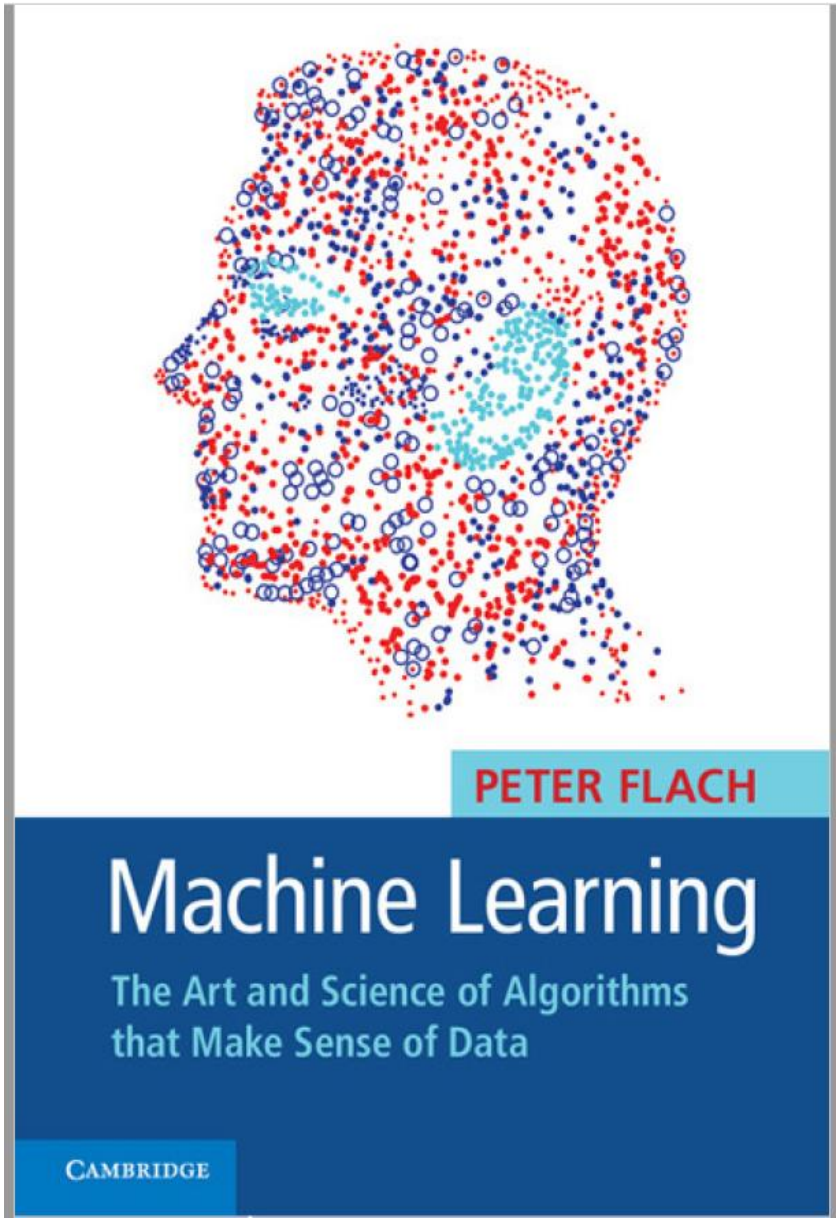
Bayesian Learning: Introduction, Bayes theorem, Bayes optimal classifier, Naïve Bayes classifier, Bayesian belief networks.

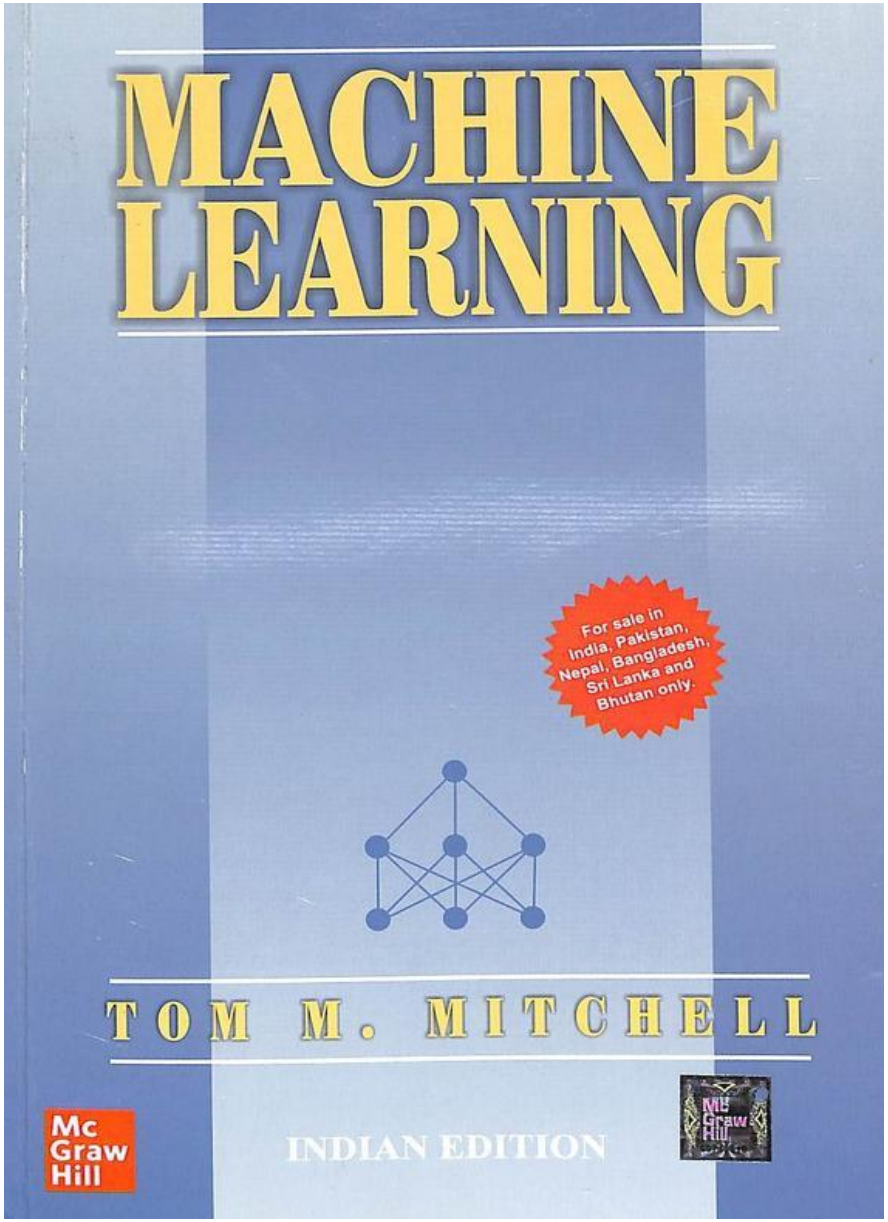
- **Unit IV**

Artificial Neural Networks: Introduction, Neural network representation, appropriate problems for neural network learning, Multilayer networks and the back propagation, Advanced topics in Artificial Neural Networks

Reinforcement Learning: Introduction, Learning tasks, Q-learning

Text Books


PETER FLACH
Machine Learning
The Art and Science of Algorithms that Make Sense of Data
CAMBRIDGE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