REFERENCES:

1. Steven.S. Muchnick, Advanced Compiler Design and Implementation, Morgan Kaufman Publishers, 1997.
2. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, “Compilers: Principles, Techniques, and Tools”, Addison Wesley, Second Edition, 2007.
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4. Andrew W. Appel, Jens Palsberg, “Modern Compiler Implementation in Java”, Cambridge University Press, Second Edition, 2002.
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CP5253 MACHINE LEARNING L T P C
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OBJECTIVES:

- To understand the concepts of Machine Learning.
- To appreciate supervised learning and their applications.
- To appreciate the concepts and algorithms of unsupervised learning.
- To understand the theoretical and practical aspects of Probabilistic Graphical Models.
- To appreciate the concepts and algorithms of advanced learning.

UNIT I INTRODUCTION 8

Machine Learning–Types of Machine Learning –Machine Learning process- preliminaries, testing Machine Learning algorithms, turning data into Probabilities, and Statistics for Machine Learning- Probability theory – Probability Distributions – Decision Theory.

UNIT II SUPERVISED LEARNING 10

Linear Models for Regression – Linear Models for Classification- Discriminant Functions, Probabilistic Generative Models, Probabilistic Discriminative Models – Decision Tree Learning – Bayesian Learning, Naïve Bayes – Ensemble Methods, Bagging, Boosting, Neural Networks, Multi-layer Perceptron, Feed- forward Network, Error Back propagation - Support Vector Machines.

UNIT III UNSUPERVISED LEARNING 9

Clustering- K-means – EM Algorithm- Mixtures of Gaussians –Dimensionality Reduction, Linear Discriminant Analysis, Factor Analysis, Principal Components Analysis, Independent Components Analysis.

UNIT IV PROBABILISTIC GRAPHICAL MODELS 9

Graphical Models – Undirected Graphical Models – Markov Random Fields – Directed Graphical Models –Bayesian Networks – Conditional Independence properties – Markov Random Fields- Hidden Markov Models – Conditional Random Fields(CRFs).

UNIT V ADVANCED LEARNING 9

Sampling-Basic Sampling methods, Monte Carlo, Gibbs Sampling – Computational Learning Theory – Mistake Bound Analysis – Reinforcement learning – Markov Decision processes, Deterministic and Non-deterministic Rewards and Actions, Temporal Difference Learning Exploration.

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of the course, the student will be able to

- Design a learning model appropriate to the application.
- Design a Neural Network for an application of your choice.
- Implement Probabilistic Discriminative and Generative algorithms for an application of your choice and analyze the results.
- Use a tool to implement typical Clustering algorithms for different types of applications.
- Design and implement an HMM for a Sequence Model type of application.
- Identify applications suitable for different types of Machine Learning with suitable justification.

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2. Stephen Marsland, “Machine Learning – An Algorithmic Perspective”, Chapman andHall, CRC Press, Second Edition, 2014.
3. Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012.
4. Ethem Alpaydin, “Introduction to Machine Learning”, MIT Press, Third Edition, 2014.
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