MACHINE LEARNING IN BIOINFORMATICS

UNIT - I

Introduction-Bayesian modeling-Cox Jaynes axioms- Bayesian inference and induction- models structures- examples.

UNIT - II

Dynamic programming- EM/ GEM algorithms-Markov chain Monte carlo methods-simulated annealing- genetic algorithm-Neural networks.

UNIT - III

Sequence coding- correlations- Prediction: secondary structure, signal peptides and cleavage sites-applications for DNA & RNA nucleotide sequences- Performance evaluation.

UNIT - IV

Introduction- likelihood & Basic algorithms- Learning algorithms-Applications: general aspects, proteins, DNA and RNA

UNIT - V

Models for phylogeny-substitution probabilities-Data likelihood-optimal trees- modeling for array data

References Books

1. Søren Brunak, Pierre F Baldi, *Bioinformatics: The Machine Learning approach,* MIT Press, 2001.
2. Steffen Schulze-Kremer, Molecular Bioinformatics: Algorithms and Applications, Walter de Gruyter, 1996.
3. Balas Kausik Natarajan, *Machine Learning: A Theoretical Approach,* Morgan Kaufmann, 1991.
4. Yi-Ping Phoebe. Chen, *Bioinformatics Technologies,* Springer, 2005.