

NATIONAL INSTITUTE OF TECHNOLOGY JAMSHEDPUR
JHARKHAND 831014
Department of Computer Applications
FIFTH SEMESTER 2021-2022
Course Handout

Dated: 04.08.2021

Course Code : CA3502
Course Title : Pattern Recognition
Credit Structure : 3-1-0
Course Instructor : Dr. A. K. Mehta

Course Description

Pattern recognition techniques are used to design automated systems that improve their own performance through experience. This course covers the methodologies, technologies, and algorithms of statistical pattern recognition from a variety of perspectives. Topics including Bayesian Decision Theory, Estimation Theory, Linear Discrimination Functions, Nonparametric Techniques, Support Vector Machines, Neural Networks, Decision Trees, and Clustering Algorithms etc. will be presented.

Text Book

Duda, Hart and Stork, *Pattern Classification*, Second Edition, Wiley, 2001.

Useful supplementary books:

T.M. Mitchell, *Machine learning*, Mc Graw-Hill, New York, 1997.

S. Theodoridis, K. Koutroumbas, [*Pattern recognition*](#), Academic Press, 1999.

Course Objectives

After completing this course, the students should be able to:

1. Understand basic concepts in pattern recognition
2. Gain knowledge about state-of-the-art algorithms used in pattern recognition research
3. Understand pattern recognition theories, such as Bayes classifier, linear discriminant Analysis etc.
4. Apply pattern recognition techniques in practical problems.

Lecture Plan

Topic No.	Name of the Topics	Text/Reference Book	No. of Lecture Class
1	Pattern Recognition Basics	T – C1	4
2	Bayesian Decision Theory	T – C2	4
3	Hidden Markov Models	T– C3	3
4	Nonparametric Techniques	T – C4	4
5	Support vector Machine	T – C5	3
6	Neural Networks	T – C6	4
7	Stochastic Methods	T – C7	4
8	Decision Trees	T – C8	4
9	Algorithm Independent Learning	T – C9	4
10	Clustering	T – C10	6
Total			40

Evaluation Scheme

Sl. No.	Component	Duration (Minutes)	% Weightage	Marks	Date
1	Mid. Term Exam.		30	30	To be notified
2	End Sem. Exam.		50	50	To be notified
3	Assignment + Attendance		20	20	

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