18ECPE804	PATTERN RECOGNITION	L	T	P	C
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Prerequiste

- Digital Image Processing

Course Objectives:

1.	To understand pattern and unsupervised classification.
2.	To perform feature extraction and selection.
3.	To understand structural pattern recognition.

Unit I	PATTERN CLASSIFIER	9		0

Overview of pattern recognition - Discriminant functions - Supervised learning - Parametric estimation - Maximum likelihood estimation - Bayesian parameter estimation - Perceptron algorithm - LMSE algorithm - Problems with Bayes approach - Pattern classification by distance functions - Minimum distance pattern classifier.

Unit II	UNSUPERVISED CLASSIFICATION	9		0

Clustering for unsupervised learning and classification - Clustering concept - C-means algorithm - Hierarchical clustering procedures - Graph theoretic approach to pattern clustering - Validity of clustering solutions.

Unit III	STRUCTURAL PATTERN RECOGNITION	9		0

Elements of formal grammars - String generation as pattern description - Recognition of syntactic description - Parsing - Stochastic grammars and applications - Graph based structural representation.

Unit IV	FEATURE EXTRACTION AND SELECTION	9		0

Entropy minimization - Karhunen - Loeve transformation - Feature selection through functions approximation - Binary feature selection.

Unit V	RECENT ADVANCES	9		0

Neural network structures for Pattern Recognition - Neural network based Pattern associators - Unsupervised learning in neural Pattern Recognition - Self-organizing networks - Fuzzy logic - Fuzzy pattern classifiers - Pattern classification using Genetic Algorithms.

Total (L+T)= 45 Periods

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1	:	Solve pattern and unsupervised classification problems.
CO2	:	Perform feature extraction and selection.
CO3	:	Execute structural pattern recognition.
CO4	:	Apply neural network and fuzzy logic technique in pattern recognition.

Text Books:

1.	Robert J.Schalkoff,"Pattern Recognition Statistical, Structural and Neural Approaches", John Wiley & Sons Inc., New York, 1992.
2.	Tou and Gonzales, "Pattern Recognition Principles", Wesley Publication Company, London, 1974

Reference Books:

1.	Duda R.O., and Har P.E., "Pattern Classification and Scene Analysis", Wiley, New York, 1973.
2.	Morton Nadier and Eric Smith P., Pattern Recognition Engineering", John Wiley & Sons, New York, 1993
3.	Theodoridis Dr., Sergios, Konstantinos Koutroumbas , "Pattern Recognition ",4th Edition, Academic Press, 6 November 2008.

E-References:

1.	https://www.geeksforgeeks.org/pattern-recognition-introduction/
2.	https://freevideolectures.com/course/3194/pattern-recognition