

**INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI  
PROFORMA FOR NEW COURSE**

1.	Title of the Course	Pattern Recognition and Machine learning
2.	Course Number	EE5106
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered to	PG
6.	New Course/ Modification to	New Course
7.	To be offered by	Dr. R K Gorthi
8.	To take effect from	Jan 2018
9.	Prerequisite	CoT
10.	Whether approved by the Program	Yes
11.	<p>Course Objective: (Max 70 words)</p> <p>Student will understand the concepts, theory and computational algorithms needed for several real world recognition tasks such as text, speech, characters, objects etc. Simulate and understand how machine will have power to accomplish these tasks and can aim at developing several examples based learning tasks in several domains ranging from medical, economical, engineering to industrial needs.</p>	
12.	<p>Course Content: (Max 100 words)</p> <p>PR overview-Feature extraction-Statistical Pattern Recognition-Supervised &amp; Unsupervised Learning; Bayes decision Theory, Linear discriminant functions;</p> <p>Parametric methods, ML and MAP estimation-Bayes estimation. Non parametric methods; Parzen windows &amp; k NN approaches.</p> <p>Dimensionality reduction (PCA) &amp; Fishers linear discriminant. Linear perceptron and Neural Networks. Introduction to Deep Neural nets. Kernel methods and Support vector machine.</p> <p>Unsupervised learning and Clustering. K-means and Hierarchical clustering. Linear &amp; Logistic Regression.</p> <p>Decision trees for classification. Ensemble/ Adaboost classifier. Expectation Maximization (EM). Applications to document analysis and recognition.</p>	
13.	<p>Text Book:</p> <ol style="list-style-type: none"> <li>1. Duda R O, Hart P E, and Stork D G, <i>Pattern classification</i>, John Wiley and Sons, 2001.</li> <li>2. Christopher M B, <i>Pattern Recognition and Machine Learning</i>, Springer, 2006.</li> </ol>	
14.	<p>References:</p> <ol style="list-style-type: none"> <li>3. Sergios T and Konstantinos K, <i>Pattern Recognition</i>, 4<sup>th</sup> edition, Academic Press, 2008.</li> </ol>	