

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

1.	Title of the Course	Artificial Intelligence and Machine Learning Lab
2.	Course Number	CS5294
3.	Status of the Course	Core
4.	Structure of Credits	0-0-3-2
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Computer Science Engineering
8.	To take effect from	January 2019
9.	Prerequisite	CoT for UG
10.	Whether approved by the Department	Yes
11.	<b>Course Objective:</b> To provide hands on experience with theory discussed as part of AIML Theory course. To gain expertise with use of the state of the art platforms, libraries and data sets ranging across numerical, textual and multimedia sources.	
12.	<b>Course Content:</b> Implementation and/or use of libraries for application of algorithms including on Supervised learning algorithms including Ensemble of trees, SVM, Logistic regression, Different error functions, Regularization, Data balancing, Cross validation, AUC, Accuracy metrics. Clustering algorithms unsupervised mechanism including clustering algorithms such as K-means, Spectral and Hierarchical. Graphical models including HMM and LDA algorithms. Reinforcement algorithms including Q-Learning. Deep learning algorithms including – RBM, Auto-encoders, CNN, RNN and LSTM. Vector embedding including Word2Vec, Product2Vec. AI inference using Prolog. State of the art topics – Model maintenance, active learning, AB Testing. Popular frameworks as of the day, including such as Python, Sklearn, Tensorflow, Keras, Mxnet, Pytorch, CPLEX, BLAS and others will be used.	
13.	Text book(s): 1. Aurelien Geron, <i>Hands-on machine learning with sklearn &amp; Tensorflow</i> , O'Reilly, (2019). 2. Maxim Lapan, <i>Deep Reinforcement Learning Hands-on</i> , Packt, (2018).	
14.	Reference(s): 1. Navin Kumar Manaswi, <i>Deep Learning with Applications using Python</i> , Apress, (2018).	