INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
भारतीय प्रौद्योगिकी संस्थान तिरुपति
Yerpedu-Venkatagiri Road, Yerpedu Post, Tirupati District, Andhra Pradesh - 517 619

1.	Title of the course	Machine Learning for Mechanical Engineers
2.	Course number	ME542L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	Modified with ME607L/MACHINE LEARNING IN MECHANICS
5.	To be offered by	Mechanical Engineering
6.	Prerequisite	None
7.	**Course Objective(s):** To discuss machine learning techniques, different classes of algorithms and their applications for a range of problems in mechanical engineering.	
8.	**Course Content:** Introduction to machine learning in mechanical engineering, Mathematical preliminaries: review of linear algebra, probability and optimization, Supervised machine learning: regression and classification, machine learning algorithms: linear and logistic regression, decision trees, support vector machines, random forest, gradient boosting techniques, Neural networks: multilayer perceptron, backpropagation, convolutional neural networks, introduction to deep learning, Case studies in mechanical engineering: part classification, quality control, property prediction, design optimization - identify patterns in data, input/output mapping, synthesizing solutions.	
9.	**Textbook(s):** 1. Deisenroth M P, Faisal A A and Ong C S, Mathematics for Machine Learning, Cambridge University Press, (2020).	
10.	**Reference(s):** 1. Geron A, Hands On Machine Learning with Scikit-Learn, Keras and Tensor Flow: Concepts, Tools and Techniques to Build Intelligent Systems, 2nd Edition, (2016). 2. Goodfellow I, Deep Learning, MIT Press (2016). 3. Yagawa G and Oishi A, Computational Mechanics with Neural Networks, Springer, (2021).	