Introduction to Machine Learning

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Machine Learning is getting popular day-by-day. It is not a hype but an essential technique for any professional including budding mechanical engineers.

This workshop will cover breadth of topics of Machine Learning using Programming in Python.

# Sessions (3 hrs each {Presentation + Lab} + Exams T1 T2 Final = 42 hrs)

1. Introduction
   1. Overview of Machine Learning
   2. Overview of Python Programming and Setup
2. Python Basics and Constructs
   1. Overview, Setup, Syntax, Data Types, Operators
   2. Lists, Tuples, Dictionaries, Sets, Conditionals, Loops
3. Python Functions and Libraries
   1. Functions, Exceptions, Object, Class, File IO
   2. Libraries: Scientific, Plotting
4. Pre-requisites I
   1. Linear Algebra
   2. Data Statistics
5. Pre-requisites II
   1. Pandas
   2. Data Preparation
6. Machine Learning Basics
   1. Background and setup
   2. Concepts
7. Regression
   1. Linear Regression
   2. Logistic Regression
8. Trees
   1. Decision Tree
   2. Ensemble and Random Forest
9. Classifiers
   1. Support Vector Machines
   2. Naïve Bayes
10. Classifier/Clustering
    1. K nearest neighbour
    2. K-Means
11. Dimension Reduction
    1. Principal Component Analysis
    2. Titanic case study
12. Closure:
    1. Conclusions
    2. Project and What’s Next?