| Course Title | Course Code | Credit Hours |
|---|---|---|
| Machine Learning | CS-385 | 2-1 |

**Textbooks:**

- Tom Mitchell, "Machine Learning", McGraw Hill.

- Christopher M. Bishop, "Pattern Recognition and Machine Learning", Springer New York

- Ian Goodfellow, Yoshua Bengio, and Aaron Courville, "Deep Learning", MIT Press.

**Reference Books/Materials:**

- AI Kaggle Learn: Online Courses ( [Kaggle: Your Machine Learning and Data Science Community](#) ).

- Stanford University's Course CS229 Lecture Notes ( [https://cs229.stanford.edu/main_notes.pdf](https://cs229.stanford.edu/main_notes.pdf) ).

**Course Objectives:**

In this course, students will:

- Learn the principles of supervised, unsupervised and reinforcement learning.

- Acquire knowledge of using ML and DL to solve practical problems relevant for engineers.

**Course Outline:**

- Introduction to Machine Learning

- SVM and SoftMax Loss

- Stochastic Gradient Descent

- Computer Vision Basics

- Image Analysis

- Feature Extraction and Processing

- Shallow Neural Network

- Introduction to Deep Learning

- Backpropagation in Neural Networks

- Dropout, Batch Normalization and Optimization

- ML Explainability
- Time Series Data
- Data Cleaning
- Introduction to RNN
- Introduction to Reinforcement Learning
- Geospatial Analysis
- Revision