



KloudStac
Prep for future tech careers

AI/Machine Learning with Python



Course Description

This comprehensive course is designed to provide students with an in-depth understanding of machine learning and deep learning techniques using Python. The course covers a wide range of topics, from foundational concepts to advanced applications in computer vision, natural language processing (NLP), and reinforcement learning. It equips students with the skills and knowledge needed to tackle real-world problems and deploy machine learning models effectively.

Course Duration

60 hrs of theory & practical, upto 20 hrs of Project work Total 80 hrs

We provide a course completion certificate and offer internship assistance (for students).

Course Outline

Module 1 : Python for AI/ML

Topic: Introduction to Python as a programming language for AI/ML.

Essential libraries: Numpy, Pandas, Scikit-learn.

Description: This module serves as a foundation, teaching students the core Python libraries and data manipulation skills necessary for AI and ML tasks

- Numpy
- Pandas
- Scikit-Learn
- Matplotlib
- Seaborn

Module 2 : Deep Learning Frameworks

- Tensorflow
- Keras
- Pytorch
- Neural Networks
- Lab: Creating neural networks for classification

Topics: Overview of deep learning frameworks: Keras, TensorFlow, PyTorch.

Description: Students learn to work with popular deep learning frameworks, enabling them to build and train neural networks efficiently.

Module 3: Machine Learning Fundamentals

Topics: Supervised and unsupervised learning concepts.
Feature engineering techniques.

Description: This module covers the fundamental principles of machine learning, including data preprocessing, supervised and unsupervised learning, and feature engineering.

- Supervised & Unsupervised learning
- Feature Engineering
- Lab: Feature Engineering

Course Outline

Module 4: Supervised Learning and Support Vector Machines (SVM)

- Supervised learning methods - Classification & Regression
- Support Vector Machines
- Lab: Classification & Regression
- Lab: Using SVMs for classification

Topics: Classification and regression in supervised learning.
Support Vector Machines: Concepts and practical applications.

Description: Students gain hands-on experience in implementing and fine-tuning supervised learning models, including SVMs

Module 5: Unsupervised Learning and Deep Neural Networks (DNN)

Topic: Dimensionality reduction and clustering in unsupervised learning.

Deep neural networks: Architectures and training.

Description: This module dives deep into unsupervised learning techniques and introduces students to deep neural networks for classification and regression tasks.

- Dimensionality reduction
- Clustering in unsupervised learning
- Deep Neural Networks
- Various architectures of Unsupervised learning
- Lab: Unsupervised learning methods - Dimensionality Reduction
- Lab: Coding MLP for classification & regression

Course Outline

Module 6: Model Ensembles and Evaluation

Topics: Ensembling methods, including Random Forest. Model evaluation and performance metrics.

Description: Students explore techniques for improving model performance through ensembles and learn how to assess model effectiveness.

- Ensembles and Random Forest
- Model Evaluation
- Lab: Model Evaluations and comparisons

Module 7: Advanced Machine Learning

- ML System Design
- AI models from Huggingface
- RNNs for NLP
- Lab: Coding RNN for NLP Tasks
- LSTMs for NLP
- Lab: Coding LSTM for NLP tasks
- GRUs for NLP
- Lab: Coding GRU for NLP tasks

Topics: ML system design and working with Huggingface. Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM) networks.

Description: This module covers ML system design, advanced NLP with RNNs and LSTMs, and integrating Huggingface for NLP tasks.

Course Outline

Module 8: Computer Vision and Deep Generative Modeling

Topics: Convolutional Neural Networks (CNNs) for computer vision.

Deep generative models: Variational autoencoders (VAE), Generative adversarial networks (GAN), Autoregressive models.

Description: Students gain expertise in computer vision with CNNs and explore the world of deep generative models.

- CNNs for computer vision
- Transfer Learning in Computer Vision and NLP
- Lab: CNN for computer vision tasks
- Object Detection & Localization
- Lab: Coding Yolov7 for object detection & localization
- Image captioning
- Transformer Architecture & Self Attention
- BERT for NLP Tasks
- Vision Transformer for Computer vision
- AutoEncoders and Variational AutoEncoders(VAE)
- GANs and AutoRegressive Models
- Labs: VAE, GAN and AutoRegressive Models
- Semi supervised and self supervised learning

Module 9: Reinforcement Learning and MLOps

- Reinforcement learning
- Lab: Reinforcement Learning
- Lab: Reinforcement learning with human feedback (RLHF)
- MLOps and Model Serving
- Lab: MLOps

Topics: Reinforcement learning fundamentals and applications.
MLOps and model serving.

Description: This module delves into reinforcement learning, including RL with human feedback, and teaches students about MLOps for model deployment and management.
Course Format: The course combines lectures, hands-on coding labs, projects, and deep dives into specific topics. Students gain practical experience through coding exercises and real-world projects, enabling them to build a strong foundation in advanced machine learning and deep learning techniques.

Contact Us for a discussion and for registration for trial sessions

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