

# Python Machine Learning Advanced

Take your machine learning expertise to the next level in this comprehensive, hands-on course designed to transform foundational ML knowledge into practical, real-world applications. Move beyond standard Jupyter notebooks and explore how professional ML engineers build and deploy machine learning systems across diverse domains.

Group classes in Live Online and onsite training is available for this course. For more information, email [onsite@graduateschool.edu](mailto:onsite@graduateschool.edu) or visit: <https://www.graduateschool.edu/courses/advanced-machine-learning>



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## Course Outline

### 1. NLP & Sentiment Analysis

#### Environment Setup & NLP Fundamentals

- VS Code environment configuration, NLP libraries installation
- Tokenization, stopword removal, stemming, lemmatization
- Text representation with Bag of Words and TF-IDF

#### Sentiment Analysis Project

- Logistic Regression for sentiment classification
- Data splitting, model evaluation metrics (accuracy, precision, recall, confusion matrix)

### 2. Recommendation Systems

#### Collaborative Filtering

- User-based and item-based filtering
- Cosine similarity for personalized recommendations

#### Content-Based Movie Recommender

- Vectorizing text using TF-IDF
- Implementing content similarity algorithms

### 3. Flask App for Recommendations

#### Building an ML-Powered Web App

- Flask basics and web serving
- Developing a recommendation system Flask app

## 4. Forecasting & Deep Learning

### Time Series with Facebook Prophet

Trend forecasting and visualization (e.g., market prices)

### Deep Learning with PyTorch

- CNN basics, image classification using the CIFAR-10 dataset
- Model training, accuracy assessment, and confusion matrix interpretation

## 5. Object Detection

### Real-Time Object Detection with YOLO

- Image detection and labeling with pretrained models
- Adapting YOLO models to video streams and real-time webcam input