Syllabus Natural Language Processing (NLP) with Python & Deep Learning

Transform Text into Data: Build Chatbots, Translators, Summarizers & More with Real-World Projects

Course Subtitle

Master NLP from basics to advanced BERT, GPT, and Transformer models. Learn Sentiment Analysis, Named Entity Recognition, Machine Translation, and deploy your own NLP projects.

Course Description

Unlock the power of human language for machines. Natural Language Processing (NLP) is one of the most exciting and high-demand fields in AI, powering everything from Google Search and ChatGPT to voice assistants and automated translators.

This comprehensive course is designed to take you from **absolute beginner to proficient NLP practitioner**. You'll not just learn theory, but get **hands-on experience building real-world projects**. We'll begin with the fundamentals of text preprocessing, move through classical ML models, and then dive deep into **Deep Learning and Transformers like BERT and GPT**.

By the end, you will have the **portfolio and skills** to tackle real-world NLP problems and pursue roles like NLP Engineer, Data Scientist, or AI Specialist.

What You Will Learn

✅ Text Preprocessing: Tokenization, stemming, lemmatization, POS tagging
✅ Classic ML for NLP: Spam detection, sentiment analysis with Naive Bayes & Logistic Regression
✅ Word Embeddings: Word2Vec, GloVe, FastText
✅ Deep Learning: RNNs, LSTMs, GRUs, Transformers
✅ State-of-the-Art Models: BERT, GPT, T5, Hugging Face Transformers
✅ Real-World Projects: NER, summarization, machine translation, question answering, chatbots

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Who This Course Is For

- Aspiring Data Scientists & ML Engineers specializing in NLP

- Software Developers integrating AI into applications

- Students & researchers exploring modern NLP

- Curious learners who want to build AI systems that understand language

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Requirements & Prerequisites

- **Basic Python programming** (variables, loops, functions, data structures)

- **Foundational mathematics** (stats, vectors, derivatives – conceptual level)

- **Data analysis basics** (filtering, grouping, visualization)

- **ML fundamentals** (regression, classification, clustering – high-level understanding)

💡 Refresher resources are provided inside the course.

Getting Started: Development Setup

1. Install **Python** (with PATH enabled)

2. Install **JupyterLab**

pip install jupyterlab

3. Install **essential libraries**

pip install numpy pandas matplotlib scikit-learn nltk spacy tensorflow torch transformers datasets

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Course Curriculum

Total Hours: 80+ | **Lectures:** 200+ | **Quizzes:** 10+ | **Exercises:** 50+ | **Projects:** 5

Section 1: Welcome & Setup

- Why NLP? Power of Language AI

- Pre-course refreshers (Python, ML basics)

- Setup guide (Python, Jupyter, libraries)

Section 2: NLP Fundamentals & Text Preprocessing

- Tokenization, stopwords, stemming, lemmatization

- POS tagging

- **Hands-On Lab:** Preprocess a dataset of news articles

Section 3: Text Representation & ML

- Bag-of-Words & TF-IDF

- Naive Bayes & Logistic Regression for text

- Sentiment Analysis

- **Project 1:** Sentiment Analysis on product reviews

Section 4: Word Embeddings

- Word2Vec, GloVe, FastText

- Pre-trained embeddings

- Word similarity & analogies

- **Hands-On Lab:** Semantic relationships with vectors

Section 5: Deep Learning for NLP (RNNs & LSTMs)

- Neural Networks for NLP

- RNNs, LSTMs, GRUs

- **Project 2:** LSTM text generation

Section 6: Transformer Revolution

- Attention mechanism

- Transformer architecture

- BERT, GPT, Hugging Face

- **Hands-On Lab:** Pre-trained BERT for text classification

Section 7: Advanced NLP Applications

- Named Entity Recognition (NER)

- Text Summarization (extractive & abstractive)

- Machine Translation

- Question Answering

- **Project 3:** Build a chatbot

Section 8: Capstone Project & Next Steps

- Capstone: Live project

What You'll Get

- Hands-on projects for your portfolio

- Certificate of Completion (shareable on LinkedIn)

- Instructor & peer Q&A community

👉 **Enroll now** and start your journey to becoming an **NLP Expert** with real-world projects!