Trosc AI Course

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Preface

Welcome to Trosc AI course (2025 - 2026)!

This course is built for newcomers to the field of artificial intelligence (AI) and machine learning (ML). It aims to provide a practical introduction to the concepts and techniques used in AI.

Philosophy

Inspired by Jeremy Howard's practical deep learning course (Howard & Gugger, 2021), this course emphasizes practicality and hands-on-experience as a means to learn. It is our belief that only by entering the battleground of real-world-problems one can truly learn and grasp educational concepts. The troubles and challenges one encounters in the process of solving real-world problems are the best teachers.

It is our belief that tangible results and real projects are the greatest motivators for more exploration and learning. When a student uses a pretrained model to make an image classifier or a text generator, he or she will get excited and motivated to learn more about the field. Hence, we will start early on with applications of deep learning and neural networks, and we will use them to solve real-world problems. While we will explain the mechanisms and theory behind these models, we will not focus much on the various machine learning algorithms or mathematical derivations.

Who is this course for?

This course is designed for beginners with little to no prior experience in AI or machine learning. It is mainly targeted at students of the Suez Canal University but is open to anyone interested in learning more about AI.

We don't require any prior knowledge of machine learning algorithms or AI concepts. However, students are expected to have prior programming experience (preferably in Python) and basic understanding of calculus, linear algebra, and statistics.

Content Format

This course content will be mainly delivered through two mediums:

1. **This Website**: The website includes's the course content. It will look like a series of articles covering the theoritical concepts as well as code. This website will be updated as the course progresses. This site will remain online even after the course ends, so you can always refer back to it.
2. **Video Sessions**: During the 8-weeks this course runs, there will be weekly video sessions (1-2 hours each) where an instructor will walk through the content, explain concepts, and answer questions.

Course Structure

The course is expected to run for 8-weeks, with each week covering a specific topic. The course will be structured as follows:

Week	Topic	Description
1	What is AI and Machine Learning?	Formalizing types of machine learning and introduction to programming tools (Python, Numpy, Pandas, Jupyter).
2	Predicting a Numerical Value (Regression)	Understanding regression problems, linear regression, evaluation metrics, and a practical example
3	Predicting a Category (Classification)	Understanding classification problems, logistic regression, evaluation metrics, and a practical example
4	Unsupervised Learning and Clustering	Intro to unsupervised learning and clustering algorithms
5	Introduction to Neural Networks	Understanding neural networks, activation functions, and forward and backward propagation
6	Computer Vision and Intro to CNNs	Using pretrained models for image classification and exploring convolutional neural networks
7	NLP and Intro to embeddings	Using pretrained models for text classification and exploring word embeddings
8	Transformers and LLMs	Understanding auto-regressive models, a high-level overview of transformers and attention mechanisms, and using LLMs for text generation

References

Howard, J., & Gugger, S. (2021). *Deep learning for coders with FASTAI and pytorch: AI applications without a phd*. O'Reilly Media.