IMIM Mini Course
Deep Learning in Economics and Finance
SUMMER 2025 SYLLABUS

<u>CLASS INFORMATION</u>

Date: May 31–June 1, 10:00am–12:00pm EST

Location: Zoom virtual

Discord: discord.gg/SsrNPEeP2P

TA: openai.com/blog/chatgpt

<u>INSTRUCTOR CONTACT</u>

Instructor: Fei Tan

Saint Louis University

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GENERAL INFORMATION

<u>COURSE DESCRIPTION</u>

Artificial intelligence should be made accessible to all. To this end, we provide a spelled-out introduction to neural networks and their applications for students from all disciplines, regardless of their background or area of study. Starting with the classical problem of image recognition, students will delve into the intricacies of modeling multilayer perceptrons, backpropagation algorithm for optimization, model training and evaluation, as well as extensions and variants of the basic architecture. By empowering students with hands-on modeling and programming skills, we aim to democratize AI technology and foster a community of 'AI ninjas' capable of harnessing its transformative potential for innovation, economic growth, and the betterment of humanity.

<u>PREREQUISITES</u>

Although the lectures will be self-contained, participants are required to have completed Introduction to Econometrics or an equivalent undergraduate course in statistics. Participants are also expected to be familiar with basic operations in Python, an interpreted high-level general-purpose programming language.

<u>RESOURCES</u>

- cs231n.stanford.edu – CS231n: Deep Learning for Computer Vision, by Stanford University.

- github.com/karpathy/nn-zero-to-hero – Neural Networks: Zero to Hero, by Andrej Karpathy.

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

- github.com/econdojo-class/imim-mini-course – course webpage.

TENTATIVE COURSE OUTLINE

Below is a tentative outline; the instructor reserves the right to change it whenever needed. My goal is to proceed at an optimal pace: slow enough that important concepts are thoroughly learned, yet fast enough that the course does not drag. It is a delicate balance.

Part I	**Preparation**
	Lecture 0: "Python Tutorial"
Part II	**Neural Networks**
	Lecture 1: "Linear Classifiers"
	Lecture 2: "Neural Networks"
	Lecture 3: "A Minimal Case Study"
Part III	**Applications**
	Lecture 4: "Language Modeling"
	Lecture 5: "Economic Forecasting"