

POLITECNICO
MILANO 1863

Numerical Analysis for Machine Learning

Lecture 1 – September 15th 2025

Prof. Edie Miglio

Instructors, timetable and calendar of the course

Prof. Edie Miglio – edie.miglio@polimi.it

Office hours: TBD

Dr. Matteo Caldana – matteo.caldana@polimi.it

Office hours: TBD

- Monday 16:15 – 18:15 : lec (room 3.0.3) (16:30 – 18:00)
- Tuesday 13.15 – 16.15 : lec (room 3.1.2) (13:30 – 14:45 & 15:00 - 16:00)
- Friday 13.15 – 16.15 : lab (room 3.0.2) (TBD)
- [Calendar of the course](#)

Other information

- For the lab bring **your own laptop!**
- Material and Python notebook on **WeBeep!**
- Lectures and Labs in **presence!** (Recordings and streaming on Webex). The links to the recordings will be available on WeBeep.
- In any email use the subject “NAML2025:”

Program of the course

The aim of the course is to introduce the basic mathematical and numerical concepts and tools used in the context of Machine and Deep Learning.

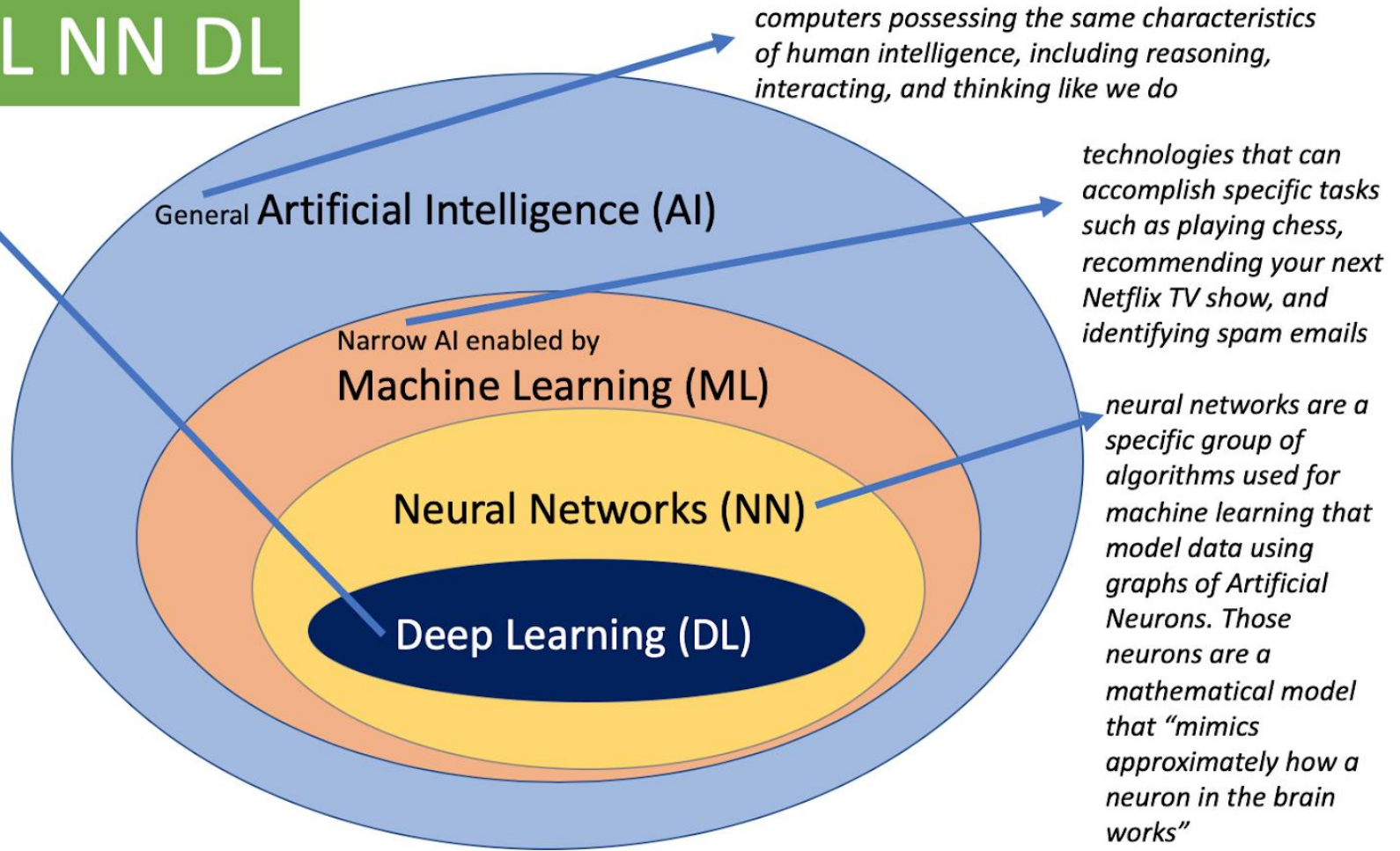
The main topics of the course are:

1. Numerical linear algebra tools
2. Automatic differentiation
3. Optimization methods
4. Approximation properties of neural networks

AI, Machine Learning, Deep Learning...

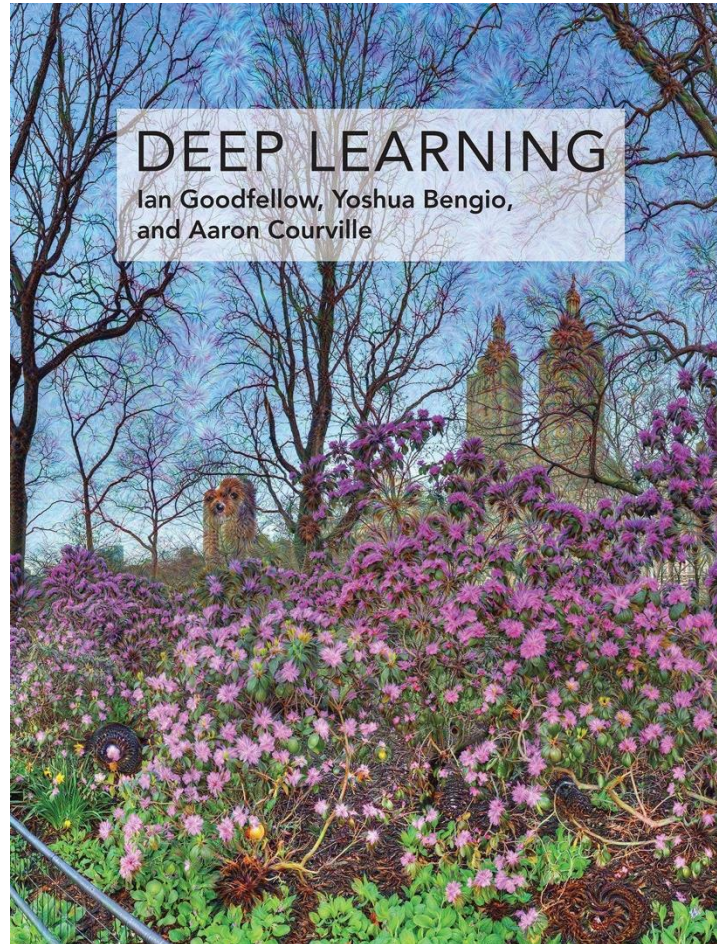
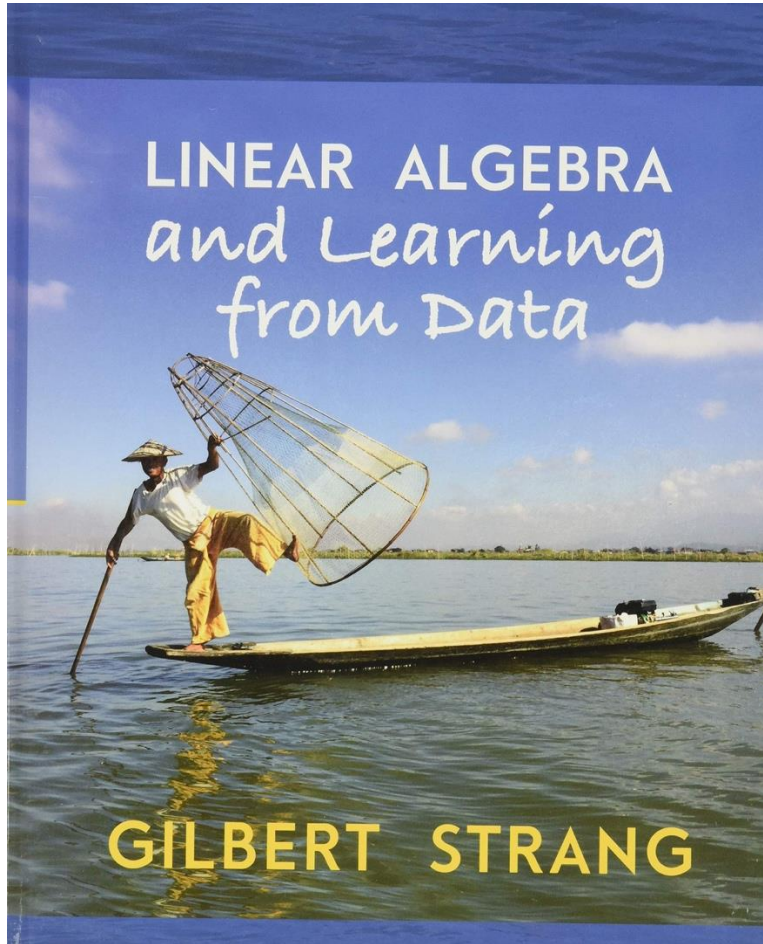
AI ML NN DL

the word "deep" comes from the fact that DL algorithms are trained/run on deep neural networks. These are just neural networks with (usually) three or more "hidden" layers



- Exam: written test and an oral colloquium.
- The maximum grade you can obtain with the written test is 28/30.
- To get a grade > 28 , students are required to have an oral exam.
- The assessment of the oral exam will be based on subject knowledge matters and quality of the oral delivery.
- 8 CFU: Written(+ oral)
- 10 CFU: Written (+ oral) + Project (to be defined).
- The project and the written (+ oral) exam can be carried out in two different sessions.
- The project is valid only for sessions in AY25-26 (except for particular situations to be discussed on a case by case basis)

Books: Theory



[LINK](#)

Programming language



Download version 3.x from <https://www.anaconda.com/open-source>

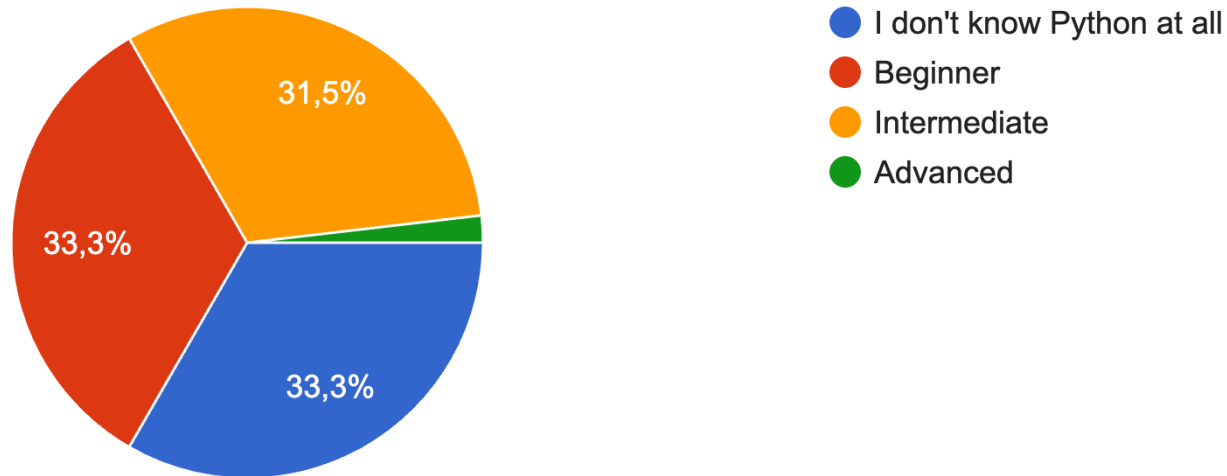


<https://colab.research.google.com/notebooks/intro.ipynb>

Introduction to Python

What is your level of knowledge of Python ?

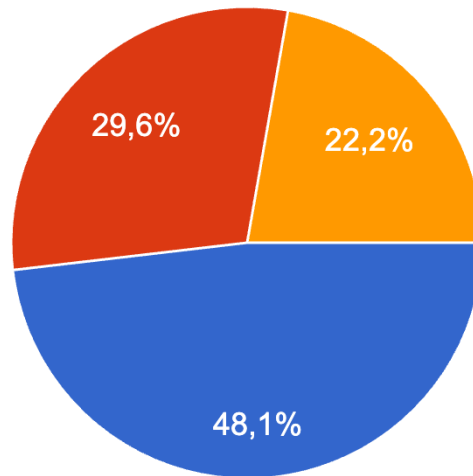
54 risposte



Introduction to Python

Would some introductory lessons on Python be helpful to you ?

54 risposte



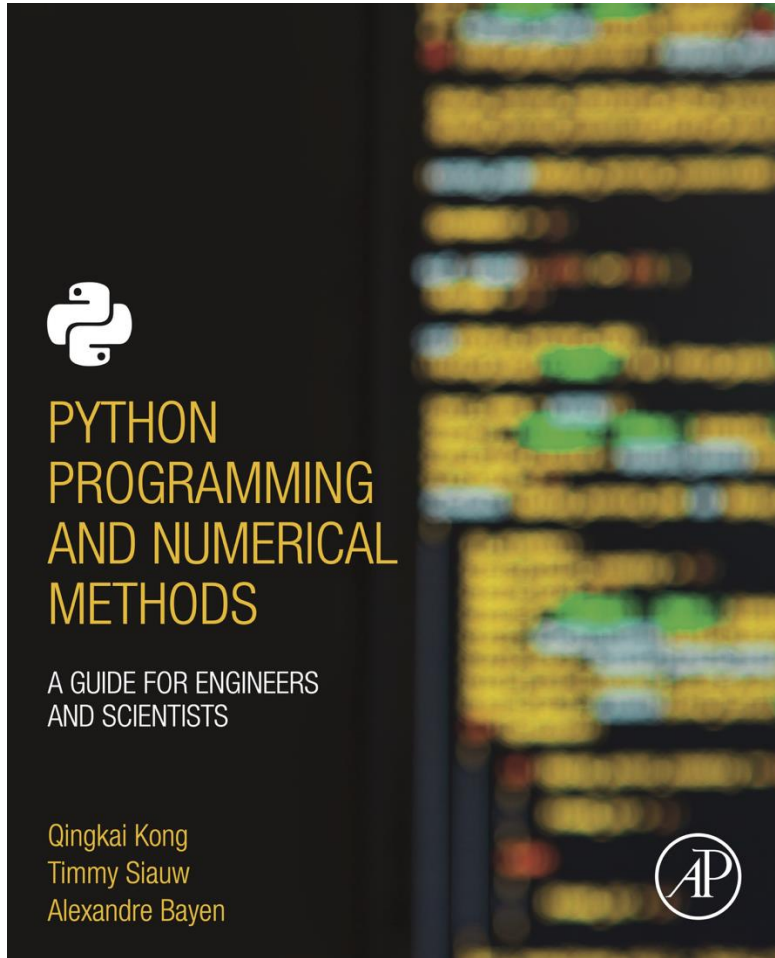
- Yes, I definitely need an introduction to Python
- Yes, it could help
- No, I am already good at Python

Introduction to Python

Short introduction to Python

- Monday September 15th
- Tuesday September 16th
- Friday September 19th

Books: Introduction to Python



[LINK](#)



THE END