

*Summer 2023 Training Course:*  
*Artificial Intelligence Applications in Structural Engineering*  
Week 1: **Python Modules - 02**

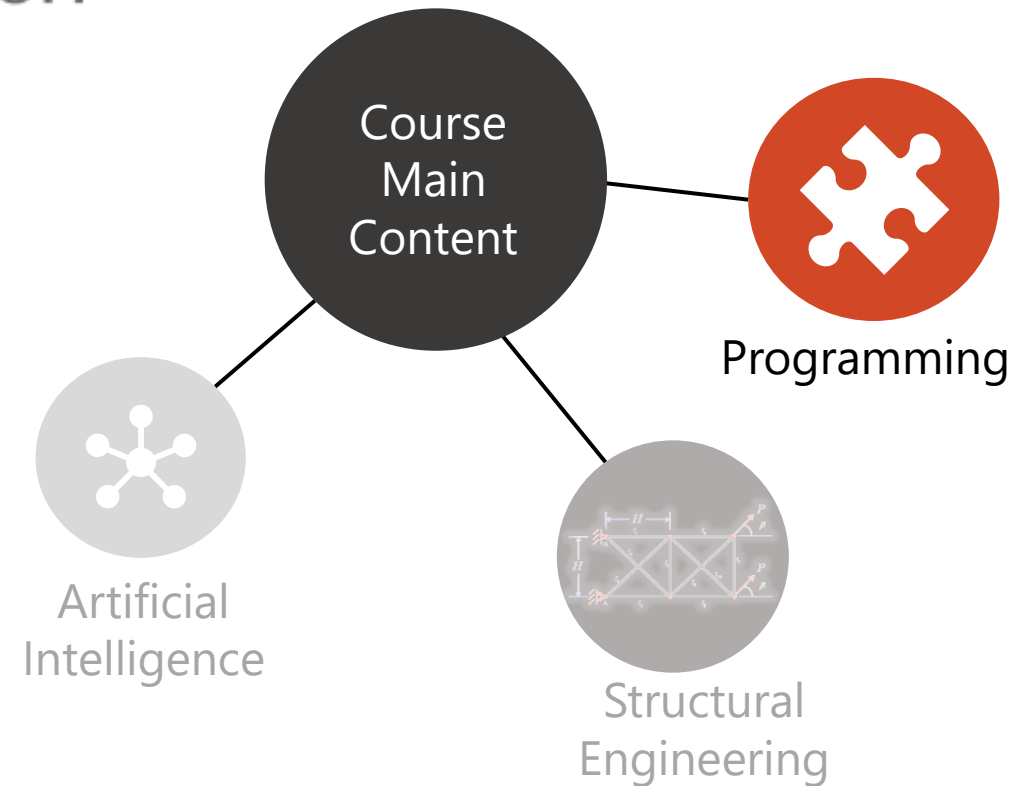
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# Week 1 – Day 1 and Day 2

Programming with Python:

1. **Numpy** mathematical module
2. **Matplotlib** plotting module
3. **Pandas** dataset/dataframe module



# Python – Modules/Libraries

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**NumPy:** a Python library for numerical computing. It provides a powerful array object, which is a container for homogeneous data that can be manipulated with mathematical operations.

**Matplotlib:** a Python library for data visualization. It provides a wide variety of plot types, including line, scatter, bar, histogram, and many others.

**Pandas:** a Python library for data manipulation and analysis. It provides two main data structures, Series and DataFrame, which are designed to handle labeled data and can be used to perform data cleaning, transformation, and statistical analysis.

Together, **NumPy**, **Matplotlib**, and **Pandas** form a powerful toolkit for **data science** and **analysis** in **Python**. They are widely used in **industry** and **academia** for tasks such as data cleaning, visualization, and **machine learning**.

# Try it out – Exercise!

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OPEN THE NOTEBOOK:

**02-Python Modules.ipynb**

# Try it out – Assignment!

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1. Complete the Notebook Exercises.
2. Test these Exercises in Spyder.