■ MSc Course: Machine Learning for Scientific Computing and Numerical Analysis

Jointly delivered by TU Eindhoven & École Polytechnique (Paris)
Part of the EuroTeQ Alliance

■ Why this course?

• Learn at the **frontier of AI and numerical analysis**.
• Gain **international exposure** through collaboration with one of Europe's top technical universities.
• Be taught by **leading researchers in the field of Scientific Computing**.

■ What will you learn?

• Combine **machine learning with PDE-based modelling**.
• Design and analyze **physics-informed neural networks** and **operator learning architectures**.
• Solve **forward and inverse problems** with hybrid approaches.
• Assess **stability, generalization, and interpretability** in ML for science and engineering.

■ Benefits for you

• Unique skills at the **intersection of ML, mathematics, and physics**.
• Hands-on case studies (turbulence, materials discovery, inverse problems).
• Strong career prospects in **AI, computational science, and engineering**.
• Build an **international network** across the EuroTeQ alliance.

■ Who can join?

• MSc students in **applied mathematics, computational science, physics, or engineering**.
• Prerequisites: linear algebra, calculus, numerical methods; basic PDEs & programming (Python).
• No prior deep ML knowledge required — we start from fundamentals!

■■■ Assessment

• **Homework (70%)** – practical implementation & analysis.
• **Mini-project (30%)** – apply course methods to an open-ended problem.

■ By the end of this course you will be able to design, implement, and evaluate ML methods for real scientific computing challenges.

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