

The background of the slide is a detailed, close-up photograph of a complex mechanical clockwork mechanism. It features numerous large and small gears, levers, and ornate metal components, all in a dark, aged brass or copper finish. The lighting is dramatic, highlighting the textures and metallic sheen of the machinery. In the lower right foreground, an open book with cream-colored pages is placed on a wooden surface, possibly a desk or a part of the clockwork's frame. The overall atmosphere is one of historical craftsmanship and intellectual pursuit.

Large Language Models

Course
introduction

Flavio Giobergia

Riccardo Coppola

Welcome to *LLM4SE*!

- *Large Language Models for Software Engineering*
- *6 CFU* course
- Optional course, mainly for:
 - MSc in Computer Engineering
 - MSc in Data Science & Engineering

Course division

- (*p1*) 3 CFU
 - Theoretical introduction to LLM
 - Intro to deep learning, Transformers, Large Language Models
 - ft. Flavio Giobergia
 - Approx. from today to early November
- (*p2*) 3 CFU
 - *Practical applications of LLM to Software Engineering*
 - Intro to software engineering, using LLM in SE processes
 - ft. Riccardo Coppola
 - Approx. from early November to end of Semester

Learning objectives

- (*p1*) Theoretical foundations of LLM
 - Transformers architecture
 - LLM taxonomy and evolution
 - LLM training, fine-tuning, evaluation
- (*p2*) Practical applications of LLM to SE
 - Understanding of SE
 - Prompt engineering
 - Ethical & Societal impacts

Prerequisites

- *Core concepts of Machine Learning*
 - Today we will have an intro to deep learning
 - But, we assume that you have an understanding of basic ML concepts
- *Solid knowledge of Python and main libraries*
 - We will use PyTorch, but as long as you're familiar with NumPy, you will learn PyTorch just fine!

Timeslots



Mondays



8:30 – 11:30 (3h)



Room 8



Wednesdays



11:30 – 13:00 (1.5h)



Room R1

Classes' structure

- Classes will be mainly divided into:
 - *Lectures*
 - covering the main topics of the course in traditional lecture-style classes
 - *Workshops*
 - Hands-on sessions where you will either work on assignments, or follow the instructor in solving practical exercises

Final exam

- *Written test*

- 18 points
- Covers theoretical concepts of the course
- Closed- and open-ended questions
- 75 minutes

- *Group project*

- 15 points (mandatory)
- Application of LLM skills (e.g., to address SE-related activities)
- Written report + oral presentation
- Project assigned once, delivered once and valid for the entire academic year

Office hours

- No predefined office hours
- Send us an email to schedule an appointment!
 - flavio.giobergia@polito.it
 - riccardo.coppola@polito.it

Course materials

- Slides
 - Available for both parts of the course
 - Course website:
 - https://dbdmg.polito.it/dbdmg_web/2026/large-language-models-for-software-engineering-2026-27/
 - Uploaded before each lecture
 - Constitute the main reference for the course
- Lecture recordings
 - All lectures will be recorded & available online