



# Digital Technology

## AY 2024/2025

# Course presentation

**Welcome!**

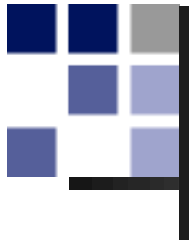
We will start at 12.30

While waiting to start please answer  
the entry questionnaire

<https://forms.office.com/e/8n3TiWJQYw?origin=IprLink>

(link on WeBeep)





# Agenda

---

- Faculty
- Course table of contents and topics
- Teaching material
- During the course
- Exams



**Barbara Pernici** ( [barbara.pernici@polimi.it](mailto:barbara.pernici@polimi.it) )

<https://pernici.faculty.polimi.it>

Full professor of Computer engineering at PoliMi - DEIB

Main research interests: information systems engineering, data quality, data and process mining, multidisciplinary projects



**Giulio Nicelli** ( [giulio.nicelli@fondazione.polimi.it](mailto:giulio.nicelli@fondazione.polimi.it) )

<https://www.linkedin.com/in/giulio-nicelli-36955628/>

Project manager at Fondazione Politecnico di Milano

Main research interests: ICT Governance, Digital transformation, Cloud computing, IT Project Managment

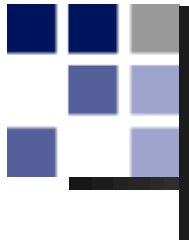


**Carlo Bono** (carlo.bono@polimi.it)

PhD in Information Technology, PoliMi, 2025

Main research interests: data analysis

Role: Python exercises



## Main goals of the course

---

- Working knowledge of querying relational databases using SQL (simple queries)
- Working knowledge of the basics of Python with notebooks (with libraries such as pandas and matplotlib). Ability to understand code, write simple functions, analyze results
- Acquire basic skills in data quality, data preparation, and data governance for different types of data
- Ability to discuss and analyse some critical aspects of digital technology (IT project management, security, ethics)

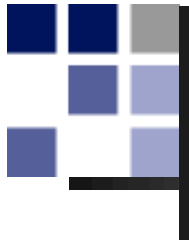


# Course presentation

The course focuses on the theme of Information Systems, Data governance and management methods and technologies, IT Project management

## Topics

- Relational databases and SQL
- Coding in Python: skills to manage and analyze data
- Data quality
- Data warehouses
- Data governance, management, and technologies
- Data sources with case studies (incl. mobile applications)
- Security and regulations
- Project management perspective for IT projects



## Course organization (1/2)

---

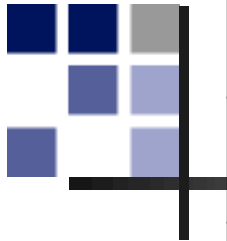
- Classes, exercises (alternating)
- Quizzes
- According to the Agenda on WeBeep
- Teaching will be in presence – no streaming
- Recordings will be uploaded after class
- Additional teaching material will be uploaded after class



# Agenda (in WeBeep) 1/3

Digital Technology - Prof. Pernici - A.Y. 2024-25				
Agenda - version 1.1 - 14/2/2025				
			Topics	Instructor Quiz
1	18/02/2025 12:15 - 14:15	BL27.1.5	Course introduction, data governance, scenarios, OLTP, OLAP	Pernici
2	19/02/2025 13:15 - 15:15	L11	Intro to data and DBMS, relational model	Pernici
3	25/02/2025 12:15 - 14:15	BL27.1.5	SQL exercises	Pernici
4	26/02/2025 13:15 - 15:15	L11	Introduction to programming and Python	Pernici Q1 Intro and DB
5	04/03/2025 12:15 - 14:15	BL27.1.5	Python - Data structures for programming - exercises	Pernici
6	05/03/2025 13:15 - 15:15	L11	Python - Pandas 1	Bono
7	11/03/2025 12:15 - 14:15	BL27.1.5	Data Quality	Pernici Q2 intro Python
8	12/03/2025 13:15 - 15:15	L11	Data Quality exercises	Pernici
9	18/03/2025 12:15 - 14:15	BL27.1.5	Python - Pandas 2	Bono





10	19/03/2025 13:15 - 15:15	L11	Data governance framework in an organization	Nicelli	
11	25/03/2025 12:15 - 14:15	BL27.1.5	Big data, pipelines, data sources, data types (JSON)	Pernici	Q3 Python and Pandas
12	26/03/2025 13:15 - 15:15	L11	Object identification, localization and mobile computing	Pernici	
13	01/04/2025 12:15 - 14:15	BL27.1.5	Project management in IT projects	Nicelli	
14	02/04/2025 13:15 - 15:15	L11	Project management - agile approaches	Nicelli	
15	15/04/2025 12:15 - 14:15	BL27.1.5	Ecosystems, data lakes, metadata, provenance	Pernici	
16	16/04/2025 13:15 - 15:15	L11	Python - exercises on time series	Bono	
17	23/04/2025 13:15 - 15:15	L11	Datawarehouses	Pernici	Q4 DQ, Big data etc, Object identification, ecosystems
18	29/04/2025 12:15 - 14:15	BL27.1.5	Python - Analysis and API	Bono	
19	30/04/2025 13:15 - 15:15	L11	Security - introduction	Pernici	
20	06/05/2025 12:15 - 14:15	BL27.1.5	Project management - agile approaches	Nicelli	



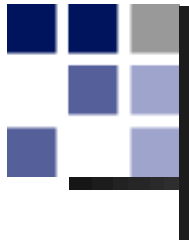
21	07/05/2025 13:15 - 15:15	L11	Project management - case study	Nicelli	
22	13/05/2025 12:15 - 14:15	BL28.12	Security - digital signature	Pernici	Q5 Datawarehouses + Project management
23	14/05/2025 13:15 - 15:15	L11	Python - Exercises on programming, APIs, data analysis	Bono	
24	20/05/2025 12:15 - 14:15	BL27.1.5	guest lecture	Pernici (Guest)	
25	21/05/2025 13:15 - 15:15	L11	Regulations GDPR, ethical issues, Data Act, AI Act	Pernici	Q6 Python
26	27/05/2025 12:15 - 14:15	BL27.1.5	<i>quiz (only on line, on webex) - no lecture</i>	Pernici	Q7 Security
27	28/05/2025 13:15 - 15:15	-	<i>no lecture</i>		



## Prerequisites

---

- For students with curiosity and passion for topics related in a **technical insight on managing data in digital innovation** and **ICT management**
- No prerequisites (although a basic programming course is expected)  
We will start from the basic concepts



# Course material

---

Distributed on WeBeep

Already available:

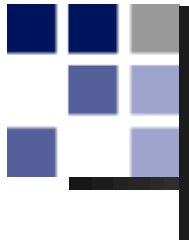
- Handouts (course book in pdf)

Distributed during class

- Text of interactive exercises, python notebooks

Distributed after class

- Slides (only for additional material)
- solutions of exercises



## During the course

---

- **Attending lectures:**

- We strongly encourage your participation in classes and active interaction (through questions, in addition to quizzes and WeBeep Forum)
- Some exercises are interactive (based on Python notebooks on Google CoLab)
- If you cannot attend you can follow the pace of the class with recording and solving the suggested exercises



# Exam rules

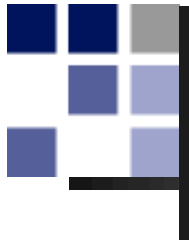
---

- **Final written exam (1.30 hrs):**

- Questions on theoretical topics explained during classes by all instructors (2 questions) also with practical exercises
- 1 exercise on Python (explaining code, write simple code or modifications, concepts)
- Some sample questions available on WeBeep and exercise book
- Equal weight for all questions

**Evaluation criteria:** completeness of information, clarity of discussion, precision, synthesis

- **Quizzes:** max 2 extra points, valid until Feb. 2026 (see next slide)



# Quizzes

---

- To revisit material during course and keep the pace of the class
- Max 2 additional points for the final grade are granted (with at least 4 quizzes, evaluation using quartiles)
- to prepare for **quizzes**
  - Study handouts (according to study list)
  - Do exercises
  - Quizzes can be taken online at the planned time even if not in presence (no webex in parallel)



## Office hours

---

- After class or on webex
- Ask for an appointment via email
- Meeting in presence (at DEIB Bldg. 20 Campus Leonardo)



# Reminder....

## Survey on the perception of academic stress and on individual psychophysical wellbeing of students @PoliMI

This survey aimed at Bachelor's and Master's degree students and Ph.D. students joins recent similar experiences conducted with faculty and technical-administrative staff.

In the past few weeks, you received emails encouraging you to fill out the questionnaire, which will **remain open until FEBRUARY 28th, 2025**.

It is a very important opportunity to highlight strengths and critical points and plan shared actions. And every voice counts and is unique!

The results will be shared with all of you, managed in anonymous and aggregate form, guaranteeing absolute privacy throughout the data collection and analysis process.

For any curiosity, doubt or question, you can refer to:

Prof. Mara Tanelli, delegata della Rettrice per Diversità e Inclusione  
[mara.tanelli@polimi.it](mailto:mara.tanelli@polimi.it)

POLITECNICO  
MILANO 1863

STUDENTS

**SURVEY ON  
ACADEMIC STRESS  
AND INDIVIDUAL  
WELL-BEING**

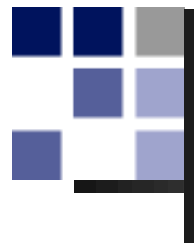
Tell us about the positive and critical aspects of **your experience at university** to help us understand how to improve!

You can fill out the questionnaire until **FEBRUARY 28th, 2025**

<https://go.polimi.it/survey>



**QUESTIONS?**



# Digital Technologies

AY 2024/2025

---

**Welcome!**

**Barbara Pernici, Politecnico di Milano**

**Giulio Nicelli, Fondazione Politecnico di Milano**

**Carlo Bono, Politecnico di Milano**