

# **Engineered Living Materials MSE 493**

**Prof. Tiffany Abitbol**

**2025**

# Welcome to ELMs

- Making materials with living cells
- A graduate school experience



# Who are we?

- Tiffany Abitbol (Professor)

MXD 230 (office)

[tiffany.abitbol@epfl.ch](mailto:tiffany.abitbol@epfl.ch)

- Buse Tatli

[Buse.Tati@epfl.ch](mailto:Buse.Tati@epfl.ch)

- Yuki Hayashi (TA)

[Yuki.Hayahsi@epfl.ch](mailto:Yuki.Hayahsi@epfl.ch)

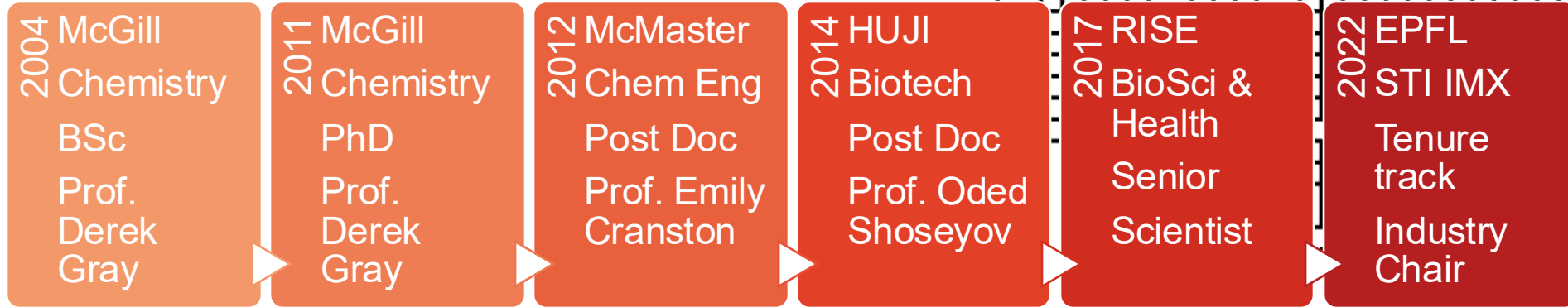
Buse T



Yuki H



# Your prof



# Sustainable Materials Laboratory

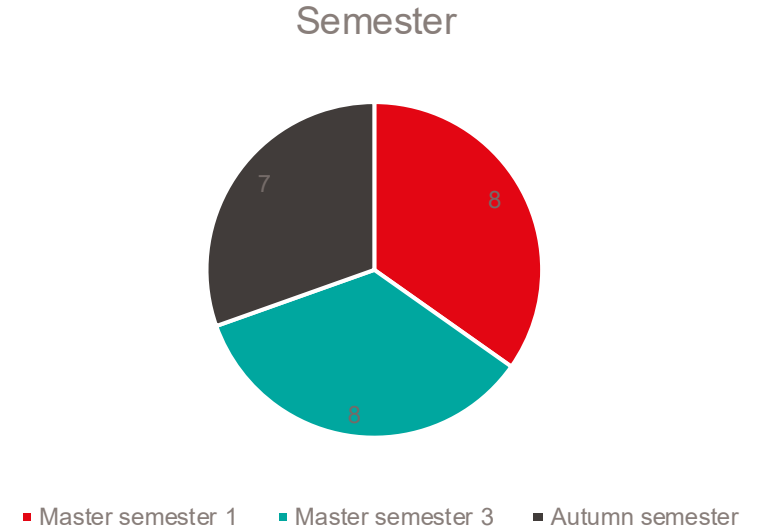
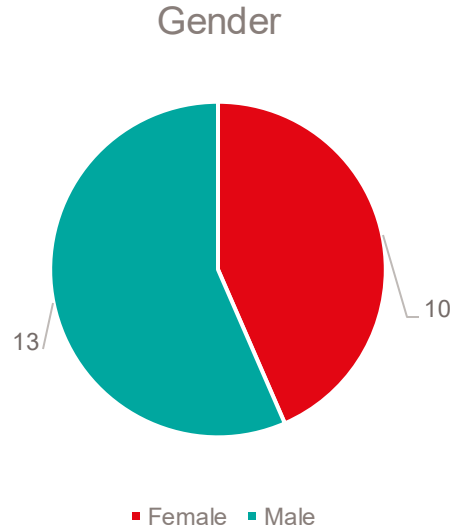
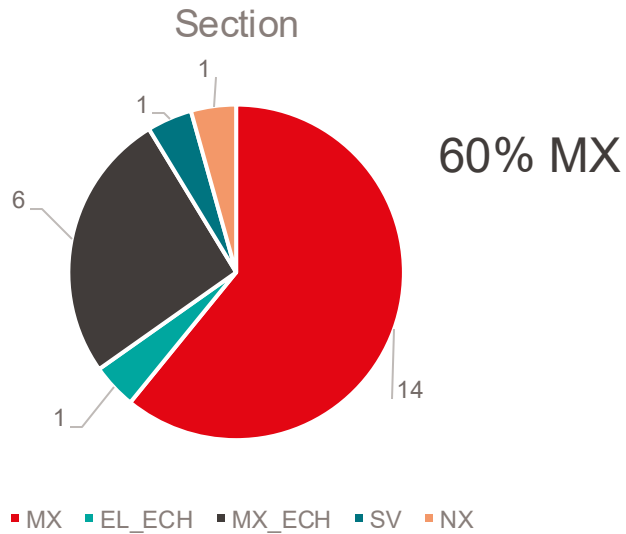


We create chemistry

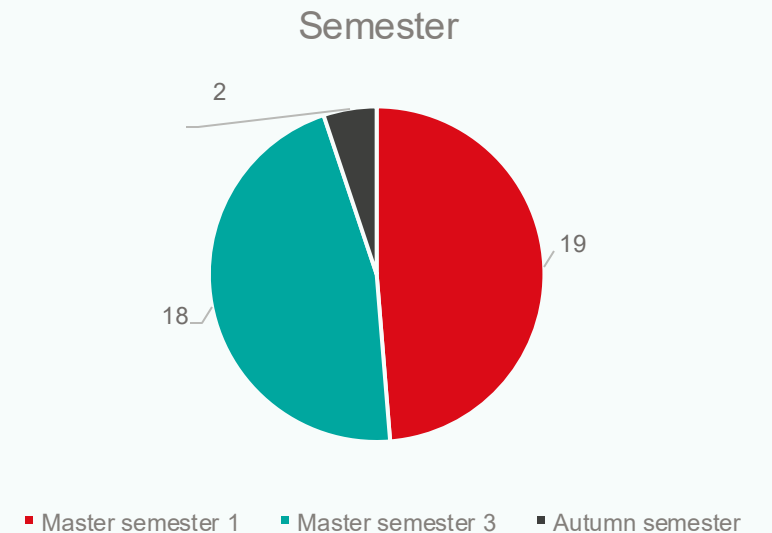
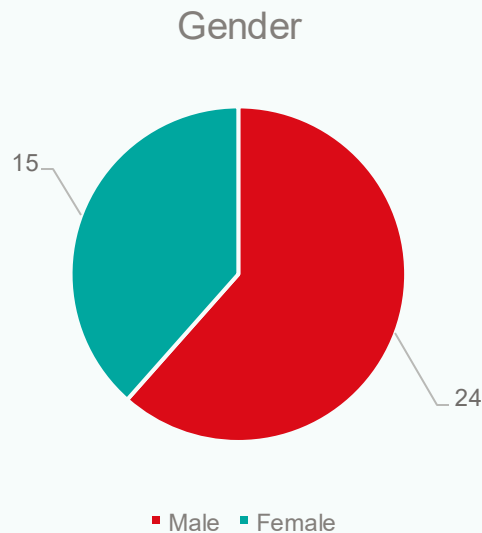
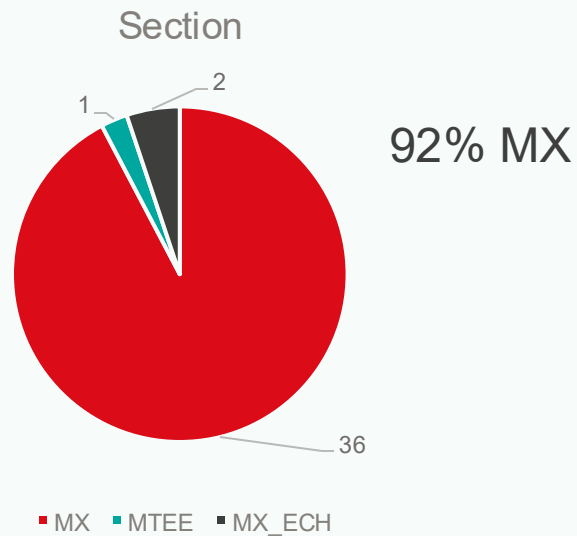


# Who are you? 23 students as of Sept 2

2025



2024



# Career paths for Materials Science and Engineering grads



## Career paths

## Types of Careers

Materials science and engineering encompasses a broad array of scientific fields and specialties, and graduates have a wide range of opportunities. Materials science and engineering graduates build dynamic futures—working as engineers and researchers with multinational companies, professors at prominent academic institutions, or policy advisors for governmental organizations. Here's a sampling of jobs materials science and engineering majors get after graduating.

- + Computational Materials Scientist
- + Data Scientist/Analyst
- + Materials Engineer
- + Metallurgist
- + Professor or Academic Researcher
- + Product Development Engineer
- + Research Scientist

# What are your plans after your masters?



A word cloud of leisure activities. The words are arranged in a roughly circular pattern. The largest word is 'video games' in red. Other large words include 'kayaking' in grey, 'hiking' in teal, and 'swimming' in teal. Smaller words include 'rock climbing' in red, 'weight lifting' in teal, 'jogging' in orange, 'ice fishing' in teal, 'bungee jumping' in grey, and 'running' in red.

bungee jumping  
running  
kayaking  
rock climbing  
video games  
weight lifting  
jogging  
ice fishing  
hiking  
swimming

# How many scientific articles have you read and mostly understood?

- A. None
- B. <10
- C. <25
- D. >25

# What are the hardest parts of reading a paper?



A word cloud of various activities. The words are arranged in a roughly circular pattern. The largest word is 'video games' in red. Other large words include 'kayaking' in grey, 'hiking' in teal, and 'swimming' in teal. Smaller words include 'bungee jumping', 'running', 'rock climbing', 'weight lifting', 'jogging', and 'ice fishing'.

bungee jumping  
running  
kayaking  
rock climbing  
video games  
weight lifting  
jogging  
ice fishing  
hiking  
swimming

# Do LLMs help?

- A. Yes
- B. No

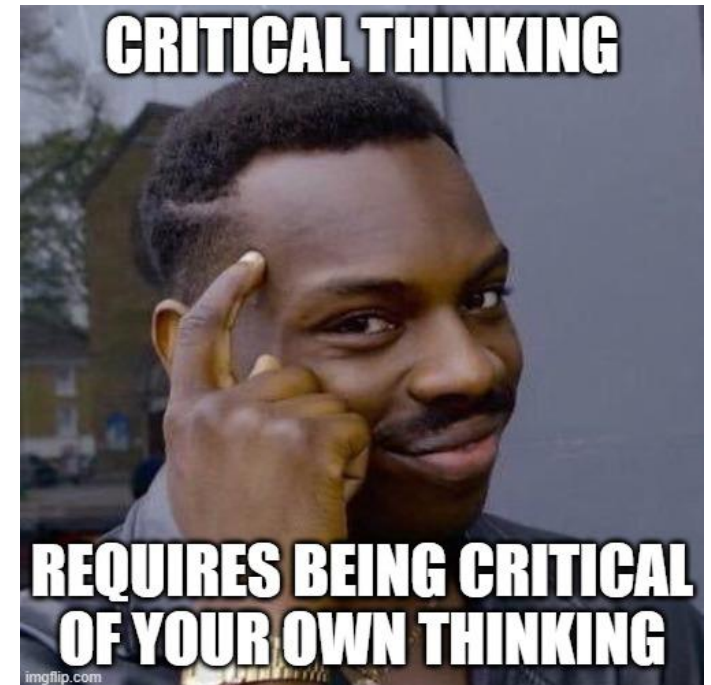
**Which models?**  
**How do you use them?**

# General course logistics

- **Where?** DIA003
- **When?** Tuesdays 14:15-17
- **Office hours in MXD 230:** 12-13 on Tuesdays (unless otherwise indicated, or by appointment)
- **Communication channels:** Moodle (primary), in person (office hours), email; as much as possible, lecture slides will be posted in advance
- **Format:** Lectures, guest lectures, 2 lab activities, exercise sessions to focus on reading homework, poster session
- **Resources:** Readings on most weeks – see *Moodle*

# So, how will we learn about ELMs?

- Learning by reading – *journal club style*
- Learning by seeing first-hand – *laboratory activities*
- Learning from experts – *guest lectures, EPFL PhD students, EPFL post docs*
- Learning by teaching and evaluating – *poster session*
- Putting it all together – *A poster session, where you propose an idea for **new** research*



# Grading

- Reading assignments – 3/6
- Poster presentation (groups assigned on Moodle) – 3/6

When you check your grades and the only "A" you have is in your name.



# Highlighted Dates

	Dates
Lab Activity #1 Yuki Hayashi	30 September
Guest lecture Dr. Guido Panzarasa, ETH Zurich	11 November
Lab Activity #2 Buse Tatli	2 December
Poster session	9 December
Ask a PhD/ask a post doc	16 December

\* Details will be provided on Moodle – be sure to check in on Moodle regularly!

- You will be split into groups of 2 on lab activity days: The first group from 2-3:30 and the second group from 3:30-5
- If you have a preferred time slot, let us know ASAP, otherwise the TAs will assign you a slot
- At the designated time, we will meet in the SML Kitchen area in **MXD 233**
- We will then go together to the lab in **MXE 114/115** for a demonstration/activity

# Short reading assignments

- Up to **5 short assignments** based on readings and posted on Moodle 1 week before lecture
- Intent of readings is to help you prepare for lecture and lab activities
- 2/5 short assignments will be associated to lab activities
- 1/5 short assignment will be associated to the guest lecture
- Other 2/5 will be announced on Moodle: *Stay tuned...*

# Logistics of poster session: December 9

- We will assign groups at random after the course add/drop deadline
- The poster session will run from 14-17 exceptionally – **snacks will be served, best poster prize will be awarded**
- Posters will be printed by TA's and mounted in the room
- We will start with a PowerPoint slide pitch from each team (3 min); slides will be submitted in advance
- Each poster team is assigned to a session, either in the role of evaluator or presenter (**5-7 min presentation**)
- As a presenter, your job is to present your poster and answer questions
- As an evaluator, your job is to evaluate posters (we will give you a grading sheet)

# What's the poster supposed to be about?

- Craft a novel research proposal in the wide-open field of ELMs
- There is some information already available on this week's Moodle
- Don't panic! We will be available to discuss and brainstorm with you in exercise and office hours

# Textbook resources (available online)

General microbiology textbooks:

1. [Industrial Biotechnology](#)
2. [Concepts of biology](#)
3. [Industrial Microbiology and Biotechnology](#)
4. [Brief Lessons of Microbiology](#)
5. [Principles of Microbiology](#)
6. [Food Microbiology Laboratory for the Food Science Student](#)

# What is expected from you in this class?

- Participation
- Reading *ahead of time* (reading homework)
- Using the resources at your disposal, and being communicative if something is unclear

