

ENG-624

**Science and Engineering Teaching and Learning - FALL**

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Cursus	Sem.	Type
EDOC General and external courses		Obl.

Language of teaching	English
Credits	2
Session	
Exam	Oral
Workload	60h
<b>Hours</b>	<b>40</b>
Courses	24
Exercises	8
TP	8
<b>Number of positions</b>	

**Frequency**

Every year

**Remark**

Flexible course with both online and on-campus components. PhD register via IS-Academia, for Master students <https://go.epfl.ch/registering-courses-exams>

**Summary**

This course develops teaching skills through the introduction of research-informed approaches and the opportunity to practice strategies appropriate for higher education science and technology contexts (exercises, labs, projects and traditional courses).

**Content**

The goals of this course are:

1. To introduce novice teachers in higher education (doctoral teaching assistants) to contemporary research-informed approaches to teaching.
2. To provide opportunities to practice and develop these skills.

Using evidence from research in learning sciences, this course presents approaches and techniques that specifically address the challenges in science, maths and engineering. Hands-on sessions offer the opportunity to practice these techniques (in the context of exercises, projects, or lab situations) and to get feedback on your teaching skills.

This course is comprised of 2 parts :

- A **self-study online module** that addresses what to do when you teach as well as explaining why these approaches work (40h). Participants' understanding of this material will be tested via an oral exam. *Note: The online module is available to everyone, enrolled in this course or not.*
- A **one-day hands-on practical Teaching toolkit** focused on applying, practising and receiving feedback on teaching strategies. There are 4 themes to these hands-on sessions (exercises, labs, projects, and explaining) and participation in any one fulfils this requirement. Topics from this lab will be included in the exam.

**Schedule:**

- The **online module** can be accessed via edX.org (runs for 8 weeks timed to conclude with the EPFL exam; includes additional application activities; you do not need to pay for the verified track) and/or as a self-paced module available on [courseware.epfl.ch](https://courseware.epfl.ch).
- For descriptions of the **Teaching Toolkits** and to sign up to attend a specific date, please visit <https://bookwhen.com/cape>
- **Exam** for Winter 2022: 13 or 14 December 2022. Exam for Spring 2023: 13 or 14 June 2023.

**Keywords**

Teaching and Learning Science and Engineering; Research and Development of Teaching Practices

### Learning Outcomes

By the end of the course, the student must be able to:

- Assess / Evaluate up-to-date developments in learning sciences related to teaching and learning of science and engineering in higher education
- Demonstrate skills in presenting for learning, in tutoring and in giving students feedback

### Transversal skills

- Take feedback (critique) and respond in an appropriate manner.
- Give feedback (critique) in an appropriate fashion.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.

### Teaching methods

Online course (feedback via multiple choice questions) plus a one-day hands-on Teaching Toolkit.

### Assessment methods

- Oral exam: 100%
- Participation in 1 (or more) hands-on session (Toolkit workshop) is required in order to sit the exam.
- Participants will receive (ungraded) feedback during the course from online quizzes, assignments, and workshop activities

### Resources

#### Bibliography

- Hattie J. (2009) Visible learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement. NY: Routledge
- Ambrose, S. et al. (2010) How Learning Works: Seven Research-Based Principles for Smart Teaching. San Francisco: Jossey-Bass
- Blessinger (2015) Inquiry based learning for science, technology engineering, and math (STEM) programmes. Bingley, UK: Emerald.

#### Websites

- <https://courseware.epfl.ch/>
- <https://bookwhen.com/cape>
- <https://www.edx.org/search>

#### Moodle Link

- <https://go.epfl.ch/ENG-624>