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
Hours	**40**
Lecture	24
Exercises	8
Practical work	8
Number of positions	

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 opportunty 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 in a written exam on EPFL campus. Note: The online module is available to everyone, enrolled in this course or not.
- A one-day hands-on practical skills lab focused on applying, practising and receiving feedback on teaching strategies. Topics from this lab will be included in the written exam. There are 4 themes to these hands-on sessions (exercises, labs, projects, and explaining) and participation in any one fulfils this requirement.
This course focuses on the teaching and learning of science and engineering in higher education and does not lead to a recognized teaching qualification for primary or post-primary schools.

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

- For descriptions of the skills labs and to sign up to attend a specific date, please visit **https://bookwhen.com/cape**

- Exam for Winter 2021: 9 or 10 December 2021. Exam for Spring 2022: 7 or 8 June 2022.

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

Teaching methods

Online course (feedback via multiple choice questions) plus in person applied skills lab.

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

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

Ressources en bibliothèque

- How learning works : seven research-based principles for smart teaching / Susan A. Ambrose [and four others] ; foreword by Richard E. Mayer
- Visible learning and the science of how we learn / John Hattie and Gregory C.R. Yates
- Inquiry-based learning for science, technology, engineering, and math (STEM) programs : a conceptual and practical resource for educators / edited by Patrick Blessinger, John M. Carfora

Websites

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