Summary
The course considers central themes in the philosophy of science, such as scientific realism and the ontology of physics. Starting from the debate between Leibniz and Newton about space and time, we move on to the transition from classical to quantum physics and the explanatory role of mathematics.

Content
Philosophical perspectives on the exact sciences and their history
How did the visions of space and time change from Galileo via Newton to Einstein? What is matter following the revolution introduced by quantum physics? What is a law of nature? Do mathematical objects really exist? These questions, among many others, will be tackled in the philosophical reflection on the exact sciences and their history that this master course offers. Reflecting on these issues provides intellectual tools for a better understanding of today’s science and technologies.

After an introductory teaching, the students work in small groups of 1 to 3 students on a particular project and present their results to the whole group. Students are free to choose the project that interests them most, but we encourage them to work on a project that is about philosophical issues raised in connection with their main branch at EPFL. We propose several interdisciplinary projects in the philosophy of physics in cooperation with professors from the physics department.

Keywords
History and philosophy of science, philosophy of physics, philosophy of mathematics

POLY-perspective:
• Interdisciplinary perspective
• Global perspective

https://www.epfl.ch/schools/cdh/cdhs-vision/

Learning Outcomes
By the end of the course, the student must be able to:
• Argue
• Formulate
• Systematize
• Develop

Transversal skills
• Assess progress against the plan, and adapt the plan as appropriate.
• Communicate effectively, being understood, including across different languages and cultures.

Teaching methods
Ex cathedra course, project work, student presentation of projects

Expected student activities
Class participation and working in groups.

Assessment methods
Oral presentation, written essay in small groups.
Evaluation on a semester basis (grade associated to 3 ECTS). Fall semester evaluation is about knowledge acquisition and the elaboration of a project plan. Spring semester evaluation is about the realization of the project. More information is given at the beginning of the academic year.

Supervision
Office hours  Yes
Assistant  Yes
Forum  No

Resources
Bibliography
Given in class

Websites
• http://www.unil.ch/philo/page60364.html