

Philosophy and Science (E075060)

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0 **Study time** 90 h

Course offerings and teaching methods in academic year 2023-2024

A (semester 1) Dutch Gent lecture

Lecturers in academic year 2023-2024

Van Dyck, Maarten	LW01	lecturer-in-charge
Beck, Pieter	LW01	co-lecturer

Offered in the following programmes in 2023-2024

	crdts	offering
Bachelor of Science in Engineering Technology (main subject Chemical Engineering Technology)	3	A
Bachelor of Science in Engineering Technology (main subject Civil Engineering Technology)	3	A
Master of Science in Electrical Engineering (main subject Communication and Information Technology)	3	A
Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)	3	A
Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)	3	A
Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)	3	A
Master of Science in Electromechanical Engineering (main subject Maritime Engineering)	3	A
Master of Science in Electromechanical Engineering (main subject Mechanical Construction)	3	A
Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)	3	A
Master of Science in Chemical Engineering	3	A
Master of Science in Chemical Engineering	3	A
Master of Science in Civil Engineering	3	A
Master of Science in Civil Engineering	3	A
Master of Science in Engineering Physics	3	A
Master of Science in Engineering Physics	3	A
Master of Science in Fire Safety Engineering	3	A
Master of Science in Materials Engineering	3	A
Master of Science in Sustainable Materials Engineering	3	A

Teaching languages

Dutch

Keywords

philosophy of science, history of science, underdetermination, theory-ladenness

Position of the course

This introductory courses teaches the student to think about the natural sciences. We investigate some philosophical questions that are related to the underdetermination of theories

by empirical evidence and "theory-ladenness". The goal is to give the student insight in both the possibilities and the limits of scientific evidential reasoning by showing the importance of these philosophical ideas for a proper understanding of the history of the sciences.

Contents

The central themes (underdetermination and theory-ladenness) are introduced through a study of a few episodes from the history of chemistry. By placing the scientific research in its historical context it is shown how empirical observations could only play their evidential role given a number of "background assumptions". The cases discussed are: Lavoisier's oxygen hypothesis, the determination of atomic weights in nineteenth century chemistry, the concept of an element in the table of Mendeleev and the changing relations between chemistry and (sub-) atomic physics.

Initial competences

Basic familiarity with some central concepts and theories in the natural sciences.

Final competences

- 1 Being able to correctly assess the philosophical and scientific implications of underdetermination of theories by empirical evidence.
- 2 Being able to correctly assess the philosophical and scientific implications of theory-ladenness.
- 3 Being able to explain the impact of underdetermination in historical case studies.
- 4 Being able to explain the impact of theory-ladenness in historical case studies.
- 5 Develop a reflective attitude that can be incorporated in one's own scientific practice.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture

Learning materials and price

Written syllabus

References

Course content-related study coaching

The teacher and his collaborators provide individual feedback when necessary.

Evaluation methods

end-of-term assessment

Examination methods in case of periodic evaluation during the first examination period

Written assessment with open-ended questions

Examination methods in case of periodic evaluation during the second examination period

Written assessment with open-ended questions

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Calculation of the examination mark

Addendum

Onder voorbehoud van goedkeuring door de Faculteitsraad Faculteit
Ingenieurswetenschappen en Architectuur