

History and Philosophy of Sciences (C004009)

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 Psychology (main subject Theoretical and Experimental Psychology) | 3 | A |
| Master of Science in Teaching in Science and Technology (main subject Biochemistry and Biotechnology) | 3 | A |
| Master of Science in Teaching in Science and Technology (main subject Biology) | 3 | A |
| Master of Science in Teaching in Science and Technology (main subject Chemistry) | 3 | A |
| Master of Science in Chemistry (main subject (Bio)Organic and Polymer Chemistry) | 3 | A |
| Master of Science in Chemistry (main subject Analytical and Environmental Chemistry) | 3 | A |
| Master of Science in Chemistry (main subject Materials and Nano Chemistry) | 3 | A |
| Master of Science in Biochemistry and Biotechnology | 3 | A |
| Master of Science in Biology | 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 show 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**

he 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

Extra information on the examination methods

Written examination or the writing of an essay (topic to be agreed upon).

Calculation of the examination mark

100% end-of-term evaluation