Politechnika Warszawska

COURSE OFFERED IN THE DOCTORAL SCHOOL

Code of the course	4606-ES-000000O-0288	Name of the course	Polish	**Filozofia nauki**	
			English	**Philosophy of science**	
Type of the course	Specialistic courses				
Course coordinator	dr hab Antonio Vassallo		Course teacher	dr hab Antonio Vassallo	
Implementing unit	WAiNS	Scientific discipline / disciplines*	Philosophy		
Level of education	Doctoral studies	Semester	Winter		
Language of the course	English				
Type of assessment	Grading	Number of hours in a semester	30h	ECTS credits	2
Minimum number of participants	12	Maximum number of participants	40	Available for students (BSc, MSc)	Yes

Type of classes		Lecture	Auditory classes	Project classes	Laboratory	Seminar
Number of hours	in a week	2h				
	in a semester	30h				

* does not apply to the Researcher's Workshop

1. Prerequisites

No prerequisites besides high school-level knowledge of mathematics, physics and biology.

2. Course objectives

The course's objectives are (i) to familiarize students with the most pressing philosophical questions about scientific knowledge and methodology, and (ii) to build the analytical and critical skills needed to confront these questions. Four specific case studies will be analyzed to illustrate how philosophy of science deals with the conceptual issues arising in the scientific practice.

3. Course content (separate for each type of classes)

Lecture

1) What is science?
   - The origins of modern science.
   - Why is the philosophy of science important?
   - Science and pseudoscience.
2) Scientific reasoning (1).
   - Deduction and induction.
   - Hume's problem.
3) Scientific reasoning (2).
   - Inference to the best explanation.
   - Probability and induction.
4) Explanation in science (1).
   - Deductive-nomological model.
   - The problem of symmetry.
   - The problem of irrelevancy.
5) Explanation in science (2).
   - Explanation and causality.
   - Can science explain everything?

- Explanation and reduction.

6) Realism vs. anti-realism (1).
- Taking a theory very seriously: Scientific realism.
- The "no miracles" argument.

7) Realism vs. anti-realism (2).
- The "observable/unobservable" distinction.
- The non-determinism argument.

8) Scientific progress (1).
- The logical positivist philosophy of science.

9) Scientific progress (2).
- The structure of scientific revolutions.
- Incommensurability and theory-ladenness of data.

10) Objections to science.
- Scientism.
- Science versus religion.
- Is science free from values?

11) Case study 1: Philosophy of physics.
- Are space and time real?

12) Case study 2: Philosophy of biology.
- The problem of biological classification.

13) Case study 3: The philosophy of psychology.
- Is the mind modular?

14) Case Study 4: Computational Philosophy.
- Do we live in a simulation?

4. Learning outcomes			
Type of learning outcomes	Learning outcomes description	Reference to the learning outcomes of the WUT DS	Learning outcomes verification methods*
Knowledge			
K01	The doctoral student will know and understand the basic philosophical methods involved in the conceptual analysis of the scientific enterprise, and will understand the development of science in its historical context.	SD_W1	Class participation and final project.
K02	The doctoral students will know and understand the basic positions and issues in the philosophy of science. The students will know and understand the role of analytic philosophy in developing a universal account of the scientific enterprise.	SD_W2	Class participation and final project.
K03	The doctoral students will know and understand the role of ethics in scientific research and technology.	SD_W4	Class participation and final project.
Skills			
S01	The doctoral students will be able to appreciate the philosophical problems arising in their discipline of knowledge. The students will be able to use basic philosophical concepts and terms to	SD_U2	Class participation and final project.

	tackle these issues.		
S02	The doctoral students will be able to present their scientific achievements in a conceptually clear manner and will be able to find and identify relevant information in peer-reviewed works.	SD_U4	Class participation and final project.
S03	The doctoral students will be able to present and discuss their research results with a general audience.	SD_U5	Class participation and final project.
S04	The doctoral students will be able to understand and proficiently use the appropriate English terminology when discussing the conceptual and ethical issues about science in an international context.	SD_U6	Class participation and final project.
Social competences			
SC01	The doctoral students will have the competence to critically assess any achievement within the represented scientific discipline, including their own contribution to the development of the discipline.	SD_K1	Class participation and final project.
SC02	The doctoral students will recognize the importance of rational thought in solving cognitive and practical problems.	SD_K2	Class participation and final project.
SC03	The doctoral students will behave in a professional manner, will observe professional ethics, will uphold and develop the ethos of the research and creative communities, including conducting scientific activities in an independent manner.	SD_K5	Class participation and final project.

*Allowed learning outcomes verification methods: exam; oral exam; written test; oral test; project evaluation; report evaluation; presentation evaluation; active participation during classes; homework; tests

5. Assessment criteria

In each class, the students will be introduced to a specific issue and asked to actively engage in group discussions. At the end of the course, each student will write a 6-page essay on a topic agreed in advance with the instructor. The final grade will be a weighted average that considers 50% active participation during classes and 50% project evaluation (6-page essay).

6. Literature

Primary reference:

[1] S. Okasha – "Philosophy of Science: A Very Short Introduction" (Second Edition). Oxford University Press, 2016.

Secondary references:

[1] A. Rosenberg, L. McIntyre – "Philosophy of Science: A Contemporary Introduction" (Fourth Edition). Routledge, 2020.

[2] P. Godfrey-Smith – "Theory and Reality: An Introduction to the Philosophy of Science" (Second Edition). The University of Chicago Press, 2021.

7. PhD student's workload necessary to achieve the learning outcomes**

No.	Description	Number of hours
1	Hours of scheduled instruction given by the academic teacher in the classroom	30h
2	Hours of consultations with the academic teacher, exams, tests, etc.	5h
3	Amount of time devoted to the preparation for classes, preparation of	25h

	presentations, reports, projects, homework	
4	Amount of time devoted to the preparation for exams, test, assessments	
	Total number of hours	**60h**
	ECTS credits	**2**

** 1 ECTS = 25-30 hours of the PhD students work (2 ECTS = 60 hours; 4 ECTS = 110 hours, etc.)

8. Additional information	
Number of ECTS credits for classes requiring direct participation of academic teachers	1
Number of ECTS credits earned by a student in a practical course	1