



COURSE CARD

1. Basic information

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|--|---|-------------------------------------|
| Course name in English: | Critical thinking course | |
| Course name in Polish: | Kurs krytycznego myślenia | |
| Number of hours: | 30 | |
| Type of course: | Elective course | |
| Form of course: | mixed forms (combination of lecture, seminar and laboratory) | |
| Code of course: | | |
| Course leader: | Prof.dr hab. Andrzej Kisielewicz | |
| Faculty of the course leader: | W13 Faculty of Pure and Applied Mathematics | |
| Email address of the course leader: | Andrzej.kisielewicz@pwr.edu.pl | |
| Scientific discipline(s) assigned to the course (doctoral students representing the marked disciplines can participate in the course): | Architecture and urban planning | <input checked="" type="checkbox"/> |
| | Automation, electronic, electrical engineering and space technologies | <input checked="" type="checkbox"/> |
| | Information and communication technology | <input checked="" type="checkbox"/> |
| | Biomedical engineering | <input checked="" type="checkbox"/> |
| | Chemical engineering | <input checked="" type="checkbox"/> |
| | Civil engineering, geodesy and transport | <input checked="" type="checkbox"/> |
| | Materials engineering | <input checked="" type="checkbox"/> |
| | Mechanical engineering | <input checked="" type="checkbox"/> |
| | Environmental engineering, mining, and energy | <input checked="" type="checkbox"/> |
| | Mathematics | <input checked="" type="checkbox"/> |
| | Chemical sciences | <input checked="" type="checkbox"/> |
| | Physical sciences | <input checked="" type="checkbox"/> |
| | Management and quality studies | <input checked="" type="checkbox"/> |

2. Objectives

The aim of the course is to acquire knowledge and increase practical skills in the field of:

- 1) rules of correct reasoning and drawing accurate conclusions
- 2) distinguishing between truth and falsehood
- 3) ways of clear and exact formulation of thoughts
- 4) principles of effective argumentation and justification of claims
- 5) principles of rational discussion and critical thinking

3. Content

Detailed information about the course content, including topics and form of classes.

| No. | Topic | Number of hours | Form of classes |
|-----|-------|-----------------|-----------------|
| | | | |



| | | | |
|---|--|---|---------|
| 1 | The concept of argumentation, logical argumentation, deductive and inductive inference, argumentation diagrams, making diagrams and arguments assessment, principle of clarity. | 8 | lecture |
| 2 | Practical logic mechanisms, analysis of possibilities, concept of reasonable possibility, methods of reaching logical conclusions, logic and action, scientific method, cognitive dialogue. | 6 | lecture |
| 3 | Natural language and meaning, defining and definitions, ambiguity and vagueness, explanation of meanings, role of context. | 4 | seminar |
| 4 | Methods for clarifying and explaining meanings, ambiguity of sentences, classification of sentences. | 4 | seminar |
| 5 | Logic and rhetoric, line of division, errors of reasoning errors and eristic tricks, use of formal logic, clarifying meaning by synthesizing sentences and context, quantifier phrases, hierarchies of values. | 6 | seminar |
| 6 | A method of logical analysis of reasoning in natural language | 2 | project |

4. Prerequisites

List of prerequisites relating to knowledge, skills and other competences for course participants.

General education

5. Learning outcomes

List of learning outcomes at level 8 of the Polish Qualifications Framework assigned to the course (mark the learning outcomes in the last column).

| Symbol | Learning outcome | |
|--------|--|-------------------------------------|
| | <i>KNOWLEDGE. Doctoral student knows and understands:</i> | |
| SzD_W3 | the main trends in the development of the scientific or artistic disciplines covered in the curricula; | <input checked="" type="checkbox"/> |
| SzD_W4 | research methodology; | <input checked="" type="checkbox"/> |
| SzD_W5 | the rules for the dissemination of scientific results, including in open access mode; | <input type="checkbox"/> |
| SzD_W6 | the fundamental dilemmas of modern civilization; | <input checked="" type="checkbox"/> |
| SzD_W7 | the legal and ethical conditions of scientific activity; | <input type="checkbox"/> |
| SzD_W8 | the economic and other relevant conditions of scientific activity; | <input type="checkbox"/> |



| | | |
|--|--|-------------------------------------|
| SzD_W9 | basic principles of knowledge transfer to the economic and social spheres and commercialisation of results of scientific activity and know-how related to these results. | <input type="checkbox"/> |
| <i>SKILLS. Doctoral student is able to:</i> | | |
| SzD_U2 | use knowledge from different fields of science or art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular: - define the purpose and subject of scientific research, formulate a research hypothesis, - develop research methods, techniques and tools, and use them creatively, - draw conclusions on the basis of scientific research; critically analyse and evaluate the results of scientific research, expertise and other creative work and their contribution to knowledge development; transfer the results of scientific activities to the economic and social spheres; | <input checked="" type="checkbox"/> |
| SzD_U3 | communicate on specialised topics to the extent that they enable an active participation in the international scientific community; | <input checked="" type="checkbox"/> |
| SzD_U4 | disseminate research results, including in popular forms; | <input checked="" type="checkbox"/> |
| SzD_U5 | initiate debates and participate in a scientific discourse; | <input checked="" type="checkbox"/> |
| SzD_U6 | be able to speak a foreign language at B2 level of the Common European Framework of Reference for Languages to a level that enables them to participate in the international scientific and professional environment; | <input type="checkbox"/> |
| SzD_U7 | plan and implement an individual or collective research or creative activity, including in an international environment; | <input type="checkbox"/> |
| SzD_U8 | independently plan and act for one's own development and inspire and organize the development of others; | <input type="checkbox"/> |
| SzD_U9 | plan classes or groups of classes and implement them using modern methods and tools. | <input checked="" type="checkbox"/> |
| <i>SOCIAL COMPETENCES. Doctoral student is ready to:</i> | | |
| SzD_K3 | fulfilling the social obligations of researchers and creators, initiate public interest activities, thinking and acting in an entrepreneurial way; | <input type="checkbox"/> |
| SzD_K4 | maintaining and developing the ethos of research and creative environments, including: - carrying out scientific activities in an independent manner, - respecting the principle of public ownership of research results, taking into account the principles of intellectual property protection. | <input checked="" type="checkbox"/> |

6. Evaluation

Short description of the method(s) used to evaluate the learning outcomes assigned to the course, e.g., exam, test, report, presentation, etc.

Written presentation using the methods of text analysis learned during the course

7. Teaching methods

Short description of the teaching methods used during the course, e.g., multimedia presentation, discussion, literature studies, developing written documents, own work, etc.

multimedia presentation, discussion, developing written documents, own work.



8. Literature

List of primary and secondary literature used to prepare the course and including additional knowledge for participants, e.g., books, textbooks, research papers, standards, web pages, etc.

PRIMARY LITERATURE:

- [1] L.A. Groarke, C.W. Tindale, Good Reasoning Matters! (A Constructive Approach to Critical Thinking), wyd. 4, Oxford University Press, Oxford 2008
- [2] A. Kisielewicz, Logika i argumentacja, PWN, Warszawa 2017

SECONDARY LITERATURE:

- [3] R. Descartes, Discours de la méthode, 1637 (wyd. polskie: Rozprawa o metodzie, PWN, Warszawa 1981)
- [4] A. Kisielewicz, Sztuczna inteligencja i logika, WNT, Warszawa 2011
- [5] B. Pascal, The Art of Persuasion, w: Thoughts, Letters and Minor Works (Harvard Classics, Part 48), New York, P.F. Collier and Son, 1908
- [6] T. Pszczołowski, Umiejętność przekonywania i dyskusji, Wiedza Powszechna, Warszawa 1963
- [7] A. Schopenhauer, Erystyka czyli sztuka prowadzenia sporów, Wydawnictwo Literackie, Kraków 1976

9. Other remarks

Additional remarks, comments, (e.g., language of the course)

Language of the course: Polish.