UNIWERSYTET IM. ADAMA MICKIEWICZA W POZNANIU

Problem Solving

Educational subject description sheet

Basic information

Study programme Research in Cognitive Science **Speciality** - **Organizational unit** Faculty of Psychology and Cognitive Science **Study level** Second-cycle programme **Study form** Full-time **Education profile** General academic	**Didactic cycle** 2024/25 **Subject code** 23RCSS.21HS.15945.24 **Lecture languages** English **Course type** Obligatory **Block** Humanities and social subjects

Subject coordinator	Mariusz Urbański
Lecturer	Mariusz Urbański

Period	**Activities and hours**	**Number of ECTS points**
Semester 1	• Lecture: 30, Exam • Classes: 30, Graded credit	5

Goals

Code	Goal
C1	The course aims to deepen participants' insights into contemporary theory and practice of reasoning and inference focused on problem-solving issues.
C2	On the theoretical side, we shall discuss the fundamentals of problem-solving from the point of view of cognitive science, considering the impact of the influential psychologistic paradigm in research on forms of reasoning.
C3	On the practical side, we shall examine certain important developments in the analysis of problem-solving processes and their applications concerning moral reasoning and decision-making, the concept of rationality, as well as some methodological issues of empirical research on human reasoning. Our initial case study will be a profound question: what is the University for?

Subject learning outcomes

Code	Outcomes in terms of	Learning outcomes	Examination methods
Knowledge – Student:			
W1	Is able to articulate contemporary theories of reasoning and problem-solving, demonstrating an understanding of cognitive science perspectives.	RCS_K2_W01, RCS_K2_W03, RCS_K2_W05	Essay, Report
W2	Is able to critically assess concepts of moral reasoning and rationality, applying these theories to analyze decision-making processes and their applications in various contexts.	RCS_K2_W04, RCS_K2_W06, RCS_K2_W09	"Open book" exam, Report
Skills – Student:			
U1	Skilfully analyzes and applies reasoning processes to practical scenarios, particularly in moral reasoning and decision-making, demonstrating a thorough understanding of the underlying principles.	RCS_K2_U03, RCS_K2_U04, RCS_K2_U06, RCS_K2_U15	Essay, Report
U2	Can design and conduct empirical research on human reasoning and problem-solving, addressing methodological issues and effectively evaluating research findings.	RCS_K2_U01, RCS_K2_U14, RCS_K2_U17	"Open book" exam, Report
Social competences – Student:			
K1	Can articulate complex concepts related to reasoning and problem-solving clearly and persuasively, fostering improved communication in academic and professional settings.	RCS_K2_K02, RCS_K2_K03, RCS_K2_K04, RCS_K2_K09	"Open book" exam, Essay, Report
K2	Is able to critically engage with diverse perspectives on reasoning and cognition, fostering open-mindedness and the ability to participate constructively in academic and interdisciplinary discussions.	RCS_K2_K01, RCS_K2_K05, RCS_K2_K11	"Open book" exam, Essay, Report

Study content

No.	Course content	Subject learning outcomes	Activities
1.	What is the University for?	W1, K1	Lecture, Classes

No.	Course content	Subject learning outcomes	Activities
2.	Two system theories of cognitive processes.	W1, K2	Lecture, Classes
3.	Moral reasoning and decision-making.	W2, U1, K2	Lecture, Classes
4.	Rationality.	W2, U2, K2	Lecture, Classes
5.	Problem-solving: theory and practice.	W1, U1, K1	Lecture, Classes

Additional information

Activities	Teaching and learning methods and activities
Lecture	Lecture with a multimedia presentation of selected issues, Conversation lecture, Discussion, Work with text
Classes	Discussion, Work with text, Case study, Problem-based learning, Research method (scientific inquiry)

Activities	Credit conditions
Lecture	There are max 110 pts possible: - tutorials: 80 pts - exam: 30 pts Exam grade: 0 to 55 - 2 (fail) more than 55 to 70 - 3 more than 70 to 80 - 3.5 more than 80 to 90 - 4 more than 90 to 100 - 4.5 more than 100 to 110 - 5
Classes	There are max 80 pts to be earned from tutorials: - 4 tasks (30 pts max); - term paper (50 pts); Tutorials grade: 0 to 35 - 2 (fail) more than 35 to 45 - 3 more than 45 to 50 - 3.5 more than 50 to 55 - 4 more than 55 to 65 - 4.5 more than 65 to 80 - 5

Literature

Obligatory

1. W. Ruegg (ed.), "Universities in the Nineteenth and Early Twentieth Centuries (1800–1945)", Cambridge UP, 2004.
2. k. Stenning and M. van Lambalgen, "Human Reasoning and Cognitive Science", The MIT Press, 2008.
3. J. E. Adler and L. Rips (eds.) "Reasoning. Studies of Human Inference and Its Foundations", Cambridge UP, 2008.
4. A. R. Mele and P. Rawling (eds.), "The Oxford Handbook of Rationality", Oxford UP, 2004.
5. Z. Pizlo, "Problem Solving. Cognitive Mechanisms and Formal Models", Cambridge UP, 2022.

Optional

1. R. K. Sawyer (ed.), "The Cambridge Handbook of the Learning Sciences", Cambridge UP, 2005
2. M. Knauff and W. Spohn (eds.), "The Handbook of Rationality", MIT Press, 2021.
3. K. Frankish, “Dual-Process and Dual-System Theories of Reasoning”, Philosophy Compass, 5/10, 914–926, 2010.
4. A. W. Kruglanski and G. Gigerenzer, “Intuitive and Deliberate Judgments Are Based on Common Principles”, Psychological Review, Vol. 118, No. 1, 97–109, 2011.
5. B. Musschenga, “The promises of moral foundations theory”, Journal of Moral Education, Vol. 42, No. 3, 330–345, 2013.

Calculation of ECTS points

Activities	**Activity hours***
Lecture	30
Classes	30
Preparation for classes	10
Reading the indicated literature	30
Report preparation	10
Paper preparation	30
Student workload	**Hours** 140
Number of ECTS points	**ECTS** 5

* academic hour = 45 minutes

Efekty uczenia się dla kierunku

Kod	Treść
RCS_K2_K01	The graduate is ready to undertake an in-depth critical analysis of one's ideas, positions, and opinions and is prepared to change them in the light of data and arguments, knows the limitations of one's knowledge
RCS_K2_K02	The graduate is ready to demonstrate an active approach in problem-solving based on the analysis and evaluation of available data, their own research experience, and, when necessary, expert opinions
RCS_K2_K03	The graduate is ready to demonstrate sensitivity to issues of intellectual honesty in one's own and other people's actions; ensuring the reliability of conducted research (taking into account the role of the team leader)
RCS_K2_K04	The graduate is ready to conduct ethical conduct in its educational, research and publishing activities
RCS_K2_K05	The graduate is ready to collaborate with representatives from various disciplines, aimed at fostering a shared professional environment
RCS_K2_K09	The graduate is ready to actively and independently deepen and synthesize knowledge in selected fields of science
RCS_K2_K11	The graduate is ready to notice the existence of theoretical and methodological pluralism in scientific research and to recognize the consequences of this pluralism in one's own and others' research work
RCS_K2_U01	The graduate can fluently search for information from literature, databases and other sources, including the Internet, being aware of the mechanisms operating therein
RCS_K2_U03	The graduate can independently design, prepare and conduct empirical research, as well as perform statistical analysis and interpretation of results; select (or create) an appropriate research method for a given problem and an appropriate statistical method for a given problem and type of analyzed data
RCS_K2_U04	The graduate can recognize and critically evaluate the course of research reasoning conducted in the paradigms of the basic sciences of cognitive science and its subdisciplines
RCS_K2_U06	The graduate can recognize logical flaws and errors in oral and written statements and determines the impact of these flaws on the persuasiveness of arguments and their role in reasoning processes
RCS_K2_U14	The graduate can create detailed documentation of the results of carrying out a research task; prepare a study containing a discussion of these results
RCS_K2_U15	The graduate can communicate his own and other people's research reports, created in the context of the scientific research process or professional practice, precisely and coherently formulating oral and written statements
RCS_K2_U17	The graduate can use English at least at level B2+ of the Common European Framework of Reference for Languages, including a range of professional vocabulary in the field of cognitive science
RCS_K2_W01	The graduate knows and understands in an in-depth way the multidisciplinary nature of cognitive science and its sources, the position of cognitive science within the system of sciences, its subject-specific and methodological characteristics, as well as the main trends in its development
RCS_K2_W03	The graduate knows and understands various approaches to the study of the mind (e.g. computational, neuroscientific, philosophical, evolutionary), as well as the limitations and advantages of individual approaches
RCS_K2_W04	The graduate knows and understands relevant theories or research results (including his own), based on which he formulates in-depth opinions on complex cognitive science issues
RCS_K2_W05	The graduate knows and understands in an in-depth way the cognitive processes that cognitive science studies and explains: perception, consciousness, representations, emotions, memory, speech, communication, social cognition
RCS_K2_W06	The graduate knows and understands in-depth the types of disorders of processes, structures and cognitive mechanisms and the factors determining the development of these disorders

Kod	Treść
RCS_K2_W09	The graduate knows and understands the applications of cognitive science in addressing civilizational challenges such as new technologies, health, education, marketing and management, economics, spatial design, rehabilitation, social relations, human-computer communication, and also proposes new forms and fields of cognitive science applications