Akademia Humanistyczno Ekonomiczna w Łodzi

2026-2027

ACADEMIC OFFER

COGNITIVE SCIENCE



COGNITIVE SCIENCE

Language: **English** | Spring **2026-2027** | **Cognitive Science Master**

1ST YEAR / 2ND SEMESTER

Cognitive Linguistics II	lecture + exercises
Natural Language and Comprehension	lecture + exercises
Cognitive Grammar	lecture + exercises
Designing Experiments in Neuroscience	lecture + project
Theory and Methodology of Interdisciplinary Research	lecture
Cognitive Science and Linguistic Methods of Exerting Influence	lecture
Neuroaesthetics	lecture
Cognitive Psychology	project

2ND YEAR / 4TH SEMESTER

Natural Language Processing (II)	lecture + exercises
Application of linguistic corpora in cognitive linguistics (II)	lecture + exercises
The issue of free will and determinism in culture (II)	lecture + exercises
Neurospeech Therapy	lecture + exercises
Discrete Mathematics	lecture
Behavioral Economics	exercises
Legal Impplications of Cognitive Science	exercises
Programming Languages	workshops
Mental Experiments in Cognitive Science	project

Cognitive Linguistics II

lecture

2 ECTS

Teaching methods	interactive lectures / case studies / group work / problem-based discussions based on research results
Method of verifying education	exam / assignments / activity during classes

OBJECTIVES

Expanding knowledge in cognitive linguistics by exploring advanced topics such as conceptual metaphors, imagery schemas, language-thinking relationships, and cultural differences in linguistic structures. Analyzing complex linguistic structures in the context of their cognitive and cultural functions. Applying advanced research methods to language analysis, including corpus-based, experimental, and qualitative approaches. Discussing selected interdisciplinary issues, such as the relationships between language and emotion, memory, and artificial intelligence.

COURSE CONTENT

- An introduction to advanced theories of cognitive linguistics. Mental models and their application to language analysis. Image schemas and the theory of conceptual metaphor.
- Language and culture. Cultural determinants of linguistic structures. Relationships between language and ways of perceiving the world.
- Language, emotions, and memory. Language as a tool for expressing and regulating emotions. The influence of language on the processes of remembering and retrieving information.
- Application of research methods in cognitive linguistics. Corpus analyses in the study of language and thinking. Experimental design in cognitive psycholinguistics.
- An interdisciplinary approach to language. Language and artificial intelligence: modeling language with AI. Language in the context of neuroscience.
- Case studies. Analysis of selected empirical research and their implications for the theory of cognitive linguistics.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows advanced concepts and theories of cognitive linguistics, such as mental models, image schemas, and conceptual integration theory.
- Understands the relationships between language, culture and cognitive processes in the context of diverse cultures and languages.
- Has knowledge of the latest research and methodologies used in cognitive linguistics.

In terms of skills:

- The student is able to critically analyze and interpret complex linguistic data based on advanced cognitive theories.
- Is able to design empirical studies of language in a cognitive context, e.g. experimental tests or corpus analyses.
- Can integrate knowledge from cognitive linguistics with other cognitive sciences, such as psychology and anthropology.

In terms of social competencies:

- The student appreciates the complexity of cultural and linguistic diversity and their impact on cognitive processes.
- Able to collaborate in an interdisciplinary research team and effectively present analytical results.
- Is aware of the ethical aspects of linguistic research, especially in the context of cultural differences.

Cognitive Linguistics II

exercises

2 ECTS

Teaching methods	case studies / group work / individual work / problem-based discussions based on research results
Method of verifying education	project / assignments / activity during classes

OBJECTIVES

Expanding knowledge in cognitive linguistics by exploring advanced topics such as conceptual metaphors, imagery schemas, language-thinking relationships, and cultural differences in linguistic structures. Analyzing complex linguistic structures in the context of their cognitive and cultural functions. Applying advanced research methods to language analysis, including corpus-based, experimental, and qualitative approaches. Discussing selected interdisciplinary issues, such as the relationships between language and emotion, memory, and artificial intelligence.

COURSE CONTENT

- An introduction to advanced theories of cognitive linguistics. Mental models and their application to language analysis. Image schemas and the theory of conceptual metaphor.
- Language and culture. Cultural determinants of linguistic structures. Relationships between language and ways of perceiving the world.
- Language, emotions, and memory. Language as a tool for expressing and regulating emotions. The influence of language on the processes of remembering and retrieving information.
- Application of research methods in cognitive linguistics. Corpus analyses in the study of language and thinking. Experimental design in cognitive psycholinguistics.
- An interdisciplinary approach to language. Language and artificial intelligence: modeling language with AI. Language in the context of neuroscience.
- Case studies. Analysis of selected empirical research and their implications for the theory of cognitive linguistics.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows advanced concepts and theories of cognitive linguistics, such as mental models, image schemas, and conceptual integration theory.
- Understands the relationships between language, culture and cognitive processes in the context of diverse cultures and languages.
- Has knowledge of the latest research and methodologies used in cognitive linguistics.

In terms of skills:

- The student is able to critically analyze and interpret complex linguistic data based on advanced cognitive theories.
- Is able to design empirical studies of language in a cognitive context, e.g. experimental tests or corpus analyses.
- Can integrate knowledge from cognitive linguistics with other cognitive sciences, such as psychology and anthropology.

In terms of social competencies:

- The student appreciates the complexity of cultural and linguistic diversity and their impact on cognitive processes.
- Able to collaborate in an interdisciplinary research team and effectively present analytical results.
- Is aware of the ethical aspects of linguistic research, especially in the context of cultural differences.

Natural Language and Comprehension

lecture

2 ECTS

Teaching methods	lectures with multimedia presentations
Method of verifying education	exam / assignments / activity during classes

OBJECTIVES

A presentation of the mechanisms of language processing in the brain, including their biological foundations. A discussion of the impact of cognitive processes on language comprehension in a neurolinguistic and psycholinguistic context. An introduction to research methods used in neurolinguistics and psycholinguistics, such as neuroimaging and behavioral experiments. An analysis of the interactions between linguistic structures and cognitive functions, including language disorders.

COURSE CONTENT

- Introduction to neurolinguistics and psycholinguistics. Definitions and scope of research. History and development of both fields.
- The biological basis of language processing. Brain organization responsible for language functions: Broca's and Wernicke's areas, neural networks. Mechanisms of neuroplasticity and their importance for language development.
- Cognitive processes in language comprehension. The role of working memory, attention, and perception in linguistic processing. Integration of semantic, syntactic, and pragmatic information.
- Research methods in neurolinguistics and psycholinguistics. Neuroimaging (EEG, fMRI) and its application in language research. Behavioral experiments and their design.
- Language disorders and their analysis. Aphasia, dyslexia, and other language disorders. Neurological and psychological determinants of language processing disorders.
- Practical applications. Technologies supporting language comprehension and production. Language therapies based on neurolinguistic research.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the neural and cognitive mechanisms involved in language processing.
- Understands the role of the brain in interpreting the syntax, semantics, and pragmatics of natural language.
- Is aware of the influence of neurobiological and psychological factors on language development and understanding.

In terms of skills:

- The student is able to analyze data from neurolinguistic and psycholinguistic experiments.
- Is able to assess the influence of cognitive processes, such as working memory or attention, on language comprehension.
- Can use research tools such as EEG, fMRI and behavioral tests to analyze language processing.

In terms of social competencies:

- The student is aware of the interdisciplinary nature of language research and is open to collaboration with representatives of various fields.
- He is aware of the importance of an ethical approach in brain and language research, particularly when working with people with language disorders.
- Is able to critically analyze research results and their impact on theory development and practical applications.

Natural Language and Comprehension

exercises

2 ECTS

Teaching methods	practical exercises / group workshops / individual work
Method of verifying education	project / assignments / activity during classes

OBJECTIVES

A presentation of the mechanisms of language processing in the brain, including their biological foundations. A discussion of the impact of cognitive processes on language comprehension in a neurolinguistic and psycholinguistic context. An introduction to research methods used in neurolinguistics and psycholinguistics, such as neuroimaging and behavioral experiments. An analysis of the interactions between linguistic structures and cognitive functions, including language disorders.

COURSE CONTENT

- Introduction to neurolinguistics and psycholinguistics. Definitions and scope of research. History and development of both fields.
- The biological basis of language processing. Brain organization responsible for language functions: Broca's and Wernicke's areas, neural networks. Mechanisms of neuroplasticity and their importance for language development.
- Cognitive processes in language comprehension. The role of working memory, attention, and perception in linguistic processing. Integration of semantic, syntactic, and pragmatic information.
- Research methods in neurolinguistics and psycholinguistics. Neuroimaging (EEG, fMRI) and its application in language research. Behavioral experiments and their design.
- Language disorders and their analysis. Aphasia, dyslexia, and other language disorders. Neurological and psychological determinants of language processing disorders.
- Practical applications. Technologies supporting language comprehension and production. Language therapies based on neurolinguistic research.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the neural and cognitive mechanisms involved in language processing.
- Understands the role of the brain in interpreting the syntax, semantics, and pragmatics of natural language.
- Is aware of the influence of neurobiological and psychological factors on language development and understanding.

In terms of skills:

- The student is able to analyze data from neurolinguistic and psycholinguistic experiments.
- Is able to assess the influence of cognitive processes, such as working memory or attention, on language comprehension.
- Can use research tools such as EEG, fMRI and behavioral tests to analyze language processing.

In terms of social competencies:

- The student is aware of the interdisciplinary nature of language research and is open to collaboration with representatives of various fields.
- He is aware of the importance of an ethical approach in brain and language research, particularly when working with people with language disorders.
- Is able to critically analyze research results and their impact on theory development and practical applications.

Cognitive Grammar

lecture

3 ECTS

Teaching methods	interactive lectures / discussions / individual work
Method of verifying education	exam / colloquium / activity during classes

OBJECTIVES

A presentation of the basic assumptions of cognitive grammar as a model for describing language in the context of cognitive processes. A discussion of the relationship between linguistic structures and the processes of conceptualization and categorization. A presentation of methods of linguistic analysis in cognitive grammar, including the study of conceptual metaphors and image schemas. An application of cognitive grammar theory to the analysis of linguistic data and the problems of intercultural translation .

COURSE CONTENT

- Introduction to cognitive grammar. Definition and main assumptions. Developmental history and theoretical context in cognitive linguistics.
- Conceptualization in Language. Conceptualization Processes and Their Reflection in Linguistic Structures. Categorization and Prototypality: Eleanor's Theory Rosch .
- Image schemas and their role in cognitive grammar. Types of image schemas (container, path, equilibrium). Examples of image schema applications in linguistic analysis.
- Metaphor and metonymy in cognitive grammar. Conceptual metaphors according to Lakeoff and Johnson. The role of metonymy in linguistic structures and narratives.
- Linguistic data analysis. Applying cognitive grammar to corpus analysis. Examples of analysis involving metaphors and image schemas.
- Practical Applications. Cross-cultural Translation in the Context of Cognitive Grammar. The Impact of Linguistic Differences on Conceptualization and Communication.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the assumptions of cognitive grammar and its place in cognitive linguistics.
- Understands the mechanisms of conceptualization and image schemas in language.
- Knows theories related to conceptual metaphor, metonymy and the role of prototypes in linguistic categorization.

In terms of skills:

- The student is able to analyze linguistic structures in the light of the theory of cognitive grammar.
- Can identify and interpret conceptual metaphors and image patterns in texts and conversations.
- Can apply knowledge of cognitive grammar to practical problems such as translation or cross-cultural analysis.

In terms of social competencies:

- The student is aware of the importance of language as a tool for conceptualizing the world and intercultural communication.
- Able to work in interdisciplinary teams, combining knowledge from linguistics, psychology and cognitive science.
- Appreciates the importance of linguistic and cultural diversity in the context of research on grammar and cognition.

Cognitive Grammar

exercises

3 ECTS

Teaching methods	practical exercises / group projects / workshop method
Method of verifying education	project / assignments / activity during classes

OBJECTIVES

A presentation of the basic assumptions of cognitive grammar as a model for describing language in the context of cognitive processes. A discussion of the relationship between linguistic structures and the processes of conceptualization and categorization. A presentation of methods of linguistic analysis in cognitive grammar, including the study of conceptual metaphors and image schemas. An application of cognitive grammar theory to the analysis of linguistic data and the problems of intercultural translation .

COURSE CONTENT

- Introduction to cognitive grammar. Definition and main assumptions. Developmental history and theoretical context in cognitive linguistics.
- Conceptualization in Language. Conceptualization Processes and Their Reflection in Linguistic Structures. Categorization and Prototypality: Eleanor's Theory Rosch .
- Image schemas and their role in cognitive grammar. Types of image schemas (container, path, equilibrium). Examples of image schema applications in linguistic analysis.
- Metaphor and metonymy in cognitive grammar. Conceptual metaphors according to Lakeoff and Johnson. The role of metonymy in linguistic structures and narratives.
- Linguistic data analysis. Applying cognitive grammar to corpus analysis. Examples of analysis involving metaphors and image schemas.
- Practical Applications. Cross-cultural Translation in the Context of Cognitive Grammar. The Impact of Linguistic Differences on Conceptualization and Communication.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the assumptions of cognitive grammar and its place in cognitive linguistics.
- Understands the mechanisms of conceptualization and image schemas in language.
- Knows theories related to conceptual metaphor, metonymy and the role of prototypes in linguistic categorization.

In terms of skills:

- The student is able to analyze linguistic structures in the light of the theory of cognitive grammar.
- Can identify and interpret conceptual metaphors and image patterns in texts and conversations.
- Can apply knowledge of cognitive grammar to practical problems such as translation or cross-cultural analysis.

In terms of social competencies:

- The student is aware of the importance of language as a tool for conceptualizing the world and intercultural communication.
- Able to work in interdisciplinary teams, combining knowledge from linguistics, psychology and cognitive science.
- Appreciates the importance of linguistic and cultural diversity in the context of research on grammar and cognition.

Designing Experiments in Neuroscience

lecture

2 ECTS

Teaching methods	interactive lectures with multimedia presentations / group discussions / individual work
Method of verifying education	test / assignments / activity during classes

OBJECTIVES

Introducing students to the fundamental principles of experimental design in neuroscience: From defining a hypothesis to data analysis. Discussing modern research methods: neuroimaging techniques, electrophysiological studies, behavioral and psychophysiological methods. Developing practical research design skills. Preparing an experimental protocol and selecting appropriate research methods and tools. Analyzing ethical and methodological challenges: Identifying potential limitations and biases in research design.

COURSE CONTENT

- Introduction to neuroscientific research design. Types of research: experimental, correlational, observational. The process of formulating a research question and hypothesis.
- Research methods in neuroscience. Neuroimaging techniques: fMRI , PET, MEG. Electrophysiological studies: EEG, ERP, TMS. Behavioral and psychophysiological methods.
- Designing the research protocol. Sampling and randomization methods. Preparation of the research procedure and standardization.
- Data Analysis and Statistical Inference. An introduction to basic data analysis techniques.
- Presentation of results and their interpretation in the context of the research hypothesis.
- Ethics in neuroscience. Principles of research ethics: the Declaration of Helsinki, participant consent. Research limitations and responsibility.
- Practical aspects of conducting research. Research project management: from planning to publication.
- Identifying and avoiding potential methodological errors.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the methods used in neurosciences, such as fMRI , EEG, MEG, TMS, and their application in research.
- Understands the principles of planning experiments and statistical analysis of results.
- Knows the ethical standards applicable to research involving humans and animals.

In terms of skills:

- Is able to design a neuroscience experiment, taking into account the purpose of the study, sample selection, tools and procedures.
- Is able to critically evaluate scientific literature in terms of methodological correctness.
- Demonstrates the ability to interpret the results of neuroscientific research and draw conclusions in the context of the hypotheses put forward.

In terms of social competencies:

- The student is aware of the importance of ethics in scientific research and is able to make decisions in accordance with its principles.
- Understands the value of teamwork in interdisciplinary research projects.
- Demonstrates openness to constructive criticism and cooperation in developing research projects.

Designing Experiments in Neuroscience

project

2 ECTS

Teaching methods	group discussions / case studies / project method / creating research protocols and data analysis
Method of verifying education	project / assignments / activity during classes

OBJECTIVES

Introducing students to the fundamental principles of experimental design in neuroscience: From defining a hypothesis to data analysis. Discussing modern research methods: neuroimaging techniques, electrophysiological studies, behavioral and psychophysiological methods. Developing practical research design skills. Preparing an experimental protocol and selecting appropriate research methods and tools. Analyzing ethical and methodological challenges: Identifying potential limitations and biases in research design.

COURSE CONTENT

- Introduction to neuroscientific research design. Types of research: experimental, correlational, observational. The process of formulating a research question and hypothesis.
- Research methods in neuroscience. Neuroimaging techniques: fMRI , PET, MEG. Electrophysiological studies: EEG, ERP, TMS. Behavioral and psychophysiological methods.
- Designing the research protocol. Sampling and randomization methods. Preparation of the research procedure and standardization.
- Data Analysis and Statistical Inference. An introduction to basic data analysis techniques.
- Presentation of results and their interpretation in the context of the research hypothesis.
- Ethics in neuroscience. Principles of research ethics: the Declaration of Helsinki, participant consent. Research limitations and responsibility.
- Practical aspects of conducting research. Research project management: from planning to publication.
- Identifying and avoiding potential methodological errors.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the methods used in neurosciences, such as fMRI , EEG, MEG, TMS, and their application in research.
- Understands the principles of planning experiments and statistical analysis of results.
- Knows the ethical standards applicable to research involving humans and animals.

In terms of skills:

- Is able to design a neuroscience experiment, taking into account the purpose of the study, sample selection, tools and procedures.
- Is able to critically evaluate scientific literature in terms of methodological correctness.
- Demonstrates the ability to interpret the results of neuroscientific research and draw conclusions in the context of the hypotheses put forward.

In terms of social competencies:

- The student is aware of the importance of ethics in scientific research and is able to make decisions in accordance with its principles.
- Understands the value of teamwork in interdisciplinary research projects.
- Demonstrates openness to constructive criticism and cooperation in developing research projects.

Theory and Methodology of Interdisciplinary Research

lecture

2 ECTS

Teaching methods	interactive lectures / workshops on research design / group work / problem-based discussions / individual work
Method of verifying education	exam / project / assignments / activity in class

OBJECTIVES

To present the theoretical and methodological foundations of interdisciplinary research in cognitive science. To discuss the specifics of various research methods used in the humanities, social sciences, and natural sciences. To develop skills in integrating research approaches from various disciplines to design interdisciplinary research. To prepare students for independent interdisciplinary research design, implementation, and analysis of results.

COURSE CONTENT

- An introduction to interdisciplinarity in cognitive science. The history and development of interdisciplinary research. The role of integrating knowledge from different disciplines.
- Fundamentals of research methodology. Basic concepts: hypothesis, operationalization, variables, measurement. Types of research: exploratory, descriptive, experimental.
- Quantitative methods. Statistics in cognitive research: correlational and regression analyses, statistical tests. Experimental design: randomization, control groups, and results validation.
- Qualitative methods. Narrative analysis, interviews, case studies. Ethnography in cognitive research.
- Integration of methods. Combining qualitative and quantitative methods in interdisciplinary research. Practical examples of interdisciplinary research projects.
- Interdisciplinary research ethics. Ethical principles in research design and implementation. Transparency and replication practices.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the methodological principles of conducting interdisciplinary research.
- Understands the role and importance of qualitative and quantitative methods in cognitive research.
- Possesses knowledge of the specificity of various scientific fields in the context of their contribution to cognitive science (e.g. psychology, linguistics, neurobiology, philosophy).

In terms of skills:

- Is able to design interdisciplinary research, combining different scientific methods and approaches.
- Is able to interpret data obtained from research from various theoretical perspectives.
- Is able to critically evaluate the methodology used in existing interdisciplinary research.

In terms of social competencies:

- The student is aware of the need to cooperate with representatives of various disciplines in the implementation of research projects.
- Is aware of the ethical aspects of conducting scientific research, including the need for reliability, responsibility and transparency.
- Demonstrates willingness to learn new research methods and tools.

Cognitive Science and Linguistic Methods of Exerting Influence

lecture

2 ECTS

Teaching methods	interactive lectures / exercises / workshops / case studies / simulations of exerting influence / persuasive messages
Method of verifying education	project / colloquium / assignments / activity in class

OBJECTIVES

Demonstrating the fundamental cognitive mechanisms involved in perception, language, and decision-making: Discussing how the mind processes linguistic messages that influence behavior. Presenting linguistic methods of influence: Analyzing persuasion, manipulation, and argumentation in various social and media contexts. Discussing the applications of cognitive science to communication practices: Understanding how cognitive science supports the development of effective persuasive strategies. Putting theory to practical use in designing persuasive messages: Creating and assessing the effectiveness of linguistic tools of influence in various situations.

COURSE CONTENT

- An introduction to linguistic methods of exerting influence. Definitions and basic concepts: persuasion, manipulation, argumentation. Relationships between cognitive science and linguistics in the context of exerting influence.
- Cognitive mechanisms and linguistic perception. Attention and memory processes in the reception of linguistic messages. Cognitive phenomena such as priming, framing , and the anchoring effect .
- Language as a tool of influence. Rhetoric and argumentative techniques. The roles of narrative and metaphor in persuasion. The influence of grammatical and lexical structures on the interpretation of the message.
- Persuasive communication in practice. Analysis of the language of advertising, politics, and the media. Examples of persuasive and manipulative strategies.
- The ethics of influence. The limits of persuasion: the difference between manipulation and argumentation. The responsibility of the communicator and the recipient.
- Designing and analyzing persuasive messages. Creating effective persuasive messages. Evaluating message effectiveness based on empirical research.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the cognitive mechanisms involved in the processing of linguistic information, including the functions of perception, memory and attention.
- Understands the theories of persuasion and manipulation and their application in communication.
- Knows the linguistic tools of influence, such as rhetoric, framing and narrative.

In terms of skills:

- Is able to analyze and interpret persuasive linguistic messages, identifying their structures and mechanisms of action.
- Is able to design an effective persuasive message based on acquired cognitive and linguistic knowledge.
- Demonstrates the ability to critically evaluate media content and public communication in terms of persuasion and manipulation.

In terms of social competencies:

- The student is aware of the ethical implications of using methods of persuasion and manipulation.
- Understands the importance of responsibility in communication and ensuring the transparency of linguistic messages.
- Demonstrates openness to various forms of argumentation and the ability to conduct dialogue.

Neuroaesthetics

lecture

2 ECTS

Teaching methods	lectures with multimedia / cae studies / discussions / workshop method / individual work / seminars
Method of verifying education	project / test / assignments / activity in class

OBJECTIVES

Familiarize students with the fundamentals of neuroaesthetics : Understand the brain mechanisms responsible for the perception, interpretation, and creation of works of art. Discuss cognitive and emotional phenomena related to aesthetics: Analyze aesthetic perception processes and their connections to emotions and social functions. Present the results of neuroaesthetic research: Discuss selected research on the role of brain structures such as the visual cortex, limbic system, and reward-related areas in aesthetic perception. Introduction to the applications of neuroaesthetics : Understand how knowledge of neuroaesthetics can be used in artistic practice, therapy, and spatial design.

COURSE CONTENT

- Introduction to Neuroaesthetics. Definition and scope of neuroaesthetics as an interdisciplinary field of study. A brief history of aesthetics research: from philosophy to neuroscience.
- The brain and aesthetic perception. Brain structures involved in art perception: the role of the visual cortex, limbic system, and reward-related areas. Attention and memory processes in the context of aesthetics.
- Emotions and aesthetics. The role of emotions in the perception and creation of works of art. The neural basis of aesthetic pleasure.
- Neuroaesthetics in practice. Research on visual aesthetics, music, and literature. Applications of neuroaesthetics in therapy, education, and spatial design.
- Ethics and the Future of Neuroaesthetics . The Frontiers of Neuroaesthetic Research: Methodological and Ethical Challenges. Neuroaesthetics and the Commercialization of Art and Media.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the neural mechanisms related to aesthetic perception.
- Understands the role of cognitive, emotional and motivational processes in the perception of art.
- Knows selected research methods used in neuroaesthetics , such as neuroimaging (fMRI , EEG).

In terms of skills:

- The student knows the neural mechanisms related to aesthetic perception.
- Understands the role of cognitive, emotional and motivational processes in the perception of art.
- Knows selected research methods used in neuroaesthetics , such as neuroimaging (fMRI , EEG).

In terms of social competencies:

- The student demonstrates sensitivity to aesthetic and cultural diversity.
- Understands the importance of neuroaesthetics in shaping the environment and designing spaces that promote well-being.
- Able to collaborate in interdisciplinary research or project teams.

Cognitive Psychology

project

1 ECTS

Teaching methods	lecture / didactic discussion / problem method / group and individual work
Method of verifying education	project / test / assignments / activity in class

OBJECTIVES

A presentation of the functional organization of the mind and its biological substrates. An overview of methods used in cognitive behavioral, psychophysiological, and neuroimaging research. An introduction to research design. A discussion of selected theories and research findings related to key cognitive functions: perception, attention, memory, learning, control, language, judgment and decision-making, thinking, and reasoning.

COURSE CONTENT

- Research methods in cognitive psychology and neuroscience.
- Perception
- Attention
- Awareness
- Action
- Executive functions
- Tongue
- Cognition and emotions

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student has extended knowledge in the field of psychology of cognitive processes.
- He is familiar with the main directions of research and theoretical solutions in this field.
- Understands the connections between cognitive psychology and other fields of knowledge, especially cognitive science and neuroscience.

In terms of skills:

- The student reads with understanding scientific literature in the field of cognitive psychology.
- Can list specific research methods, including those used in contemporary neuroscience.
- Uses cognitive terminology efficiently.
- Is able to formulate a research or diagnostic problem in this field and propose a solution.

In terms of social competencies:

- The student is ready to interpret human behavior and social phenomena in the light of theories developed in cognitive psychology.
- He is ready to apply his knowledge to solve problems that arise.
- It acknowledges the complexity of determining human behavior without underestimating or minimizing the influence of cognitive factors.

Natural Language Processing (II)

lecture

3 ECTS

Teaching methods	lecture with practical examples / video materials
Method of verifying education	exam / colloquium / assignments / activity during classes

OBJECTIVES

A presentation of the theoretical foundations of natural language processing (NLP) and its applications in various fields. An overview of text analysis techniques, language modeling, and algorithms used in NLP. An introduction to the tools and programming environments used in NLP. Developing skills in implementing NLP solutions in practice.

COURSE CONTENT

- Introduction to NLP: Basic concepts, goals and applications.
- Linguistic foundations of NLP: Syntax, semantics, morphology, pragmatics.
- Text data processing: Tokenization, lemmatization, stemming .
- Models language : TF-IDF, word embeddings (Word2Vec, GloVe), transformers (BERT, GPT).
- Text classification: Sentiment analysis, document categorization.
- Named Entity Recognition (NER): Techniques and Algorithms.
- Text generation: Sequential models and the application of neural networks.
- Machine translation and text summarization: Models and technologies.
- NLP applications in various fields: Chatbots , business analytics, medicine.
- Ethics and challenges in NLP: Algorithmic biases, data privacy.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands theories and concepts related to natural language processing.
- Knows and understands the algorithms and models used in NLP, such as statistical models, neural networks and language models.
- Knows and understands linguistic structures and their importance in text analysis.
- Knows and understands the applications of NLP in industry, science and everyday life.

In terms of skills:

- The student is able to analyze and process text data using appropriate tools.
- Can implement NLP algorithms to solve practical problems such as text classification, sentiment analysis, and text generation.
- Can use programming libraries and tools such as NLTK, spaCy , Hugging Face Transformers .
- Evaluate and optimize language models.

In terms of social competencies:

- The student is ready to critically evaluate NLP solutions in terms of their ethical and social consequences.
- Is willing to collaborate in interdisciplinary teams on NLP-related projects.
- Is willing to continuously improve his technical and linguistic skills in a dynamically developing field.

Natural Language Processing (II)

exercises

3 ECTS

Teaching methods	programming workshops using NLP / team projects / exercises in language model implementation
Method of verifying education	implementation of NLP algorithms / report on text analysis / activity during classes

OBJECTIVES

A presentation of the theoretical foundations of natural language processing (NLP) and its applications in various fields. An overview of text analysis techniques, language modeling, and algorithms used in NLP. An introduction to the tools and programming environments used in NLP. Developing skills in implementing NLP solutions in practice.

COURSE CONTENT

- Introduction to NLP: Basic concepts, goals and applications.
- Linguistic foundations of NLP: Syntax, semantics, morphology, pragmatics.
- Text data processing: Tokenization, lemmatization, stemming .
- Models language : TF-IDF, word embeddings (Word2Vec, GloVe), transformers (BERT, GPT).
- Text classification: Sentiment analysis, document categorization.
- Named Entity Recognition (NER): Techniques and Algorithms.
- Text generation: Sequential models and the application of neural networks.
- Machine translation and text summarization: Models and technologies.
- NLP applications in various fields: Chatbots , business analytics, medicine.
- Ethics and challenges in NLP: Algorithmic biases, data privacy.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands theories and concepts related to natural language processing.
- Knows and understands the algorithms and models used in NLP, such as statistical models, neural networks and language models.
- Knows and understands linguistic structures and their importance in text analysis.
- Knows and understands the applications of NLP in industry, science and everyday life.

In terms of skills:

- The student is able to analyze and process text data using appropriate tools.
- Can implement NLP algorithms to solve practical problems such as text classification, sentiment analysis, and text generation.
- Can use programming libraries and tools such as NLTK, spaCy , Hugging Face Transformers .
- Evaluate and optimize language models.

In terms of social competencies:

- The student is ready to critically evaluate NLP solutions in terms of their ethical and social consequences.
- Is willing to collaborate in interdisciplinary teams on NLP-related projects.
- Is willing to continuously improve his technical and linguistic skills in a dynamically developing field.

Application of linguistic corpora in cognitive linguistics (II)

exercises

2 ECTS

Teaching methods	lectures with multimedia / didactic discussions / computer laboratories / design workshops
Method of verifying education	project / written assignments / activity during classes

OBJECTIVES

An introduction to the use of corpora in linguistic and cognitive research. Developing skills in analyzing corpus data in the context of studying language meaning and structure. Discussing the methodology used in corpus linguistics to study conceptualizations and cognitive schemas. Applying digital tools to language analysis and semantic pattern discovery.

COURSE CONTENT

- Introduction to Corpus Linguistics: Basic Concepts and Methodology.
- Types of linguistic corpora: Synchronous, diachronic, specialized and parallel corpora.
- Corpus Analysis Tools: A Review of Software and Their Applications.
- Analysis of meaning and conceptualization: Examining metaphors, schemas, and prototypes in corpus data.
- Collocation and frequency research: Techniques for quantitative and qualitative analysis.
- Linguistic cognitive patterns in different contexts: Applications to discourse analysis, education, and artificial intelligence.
- Designing your own corpus research: From formulating hypotheses to interpreting results.
- Case studies: Analysis of selected research projects using corpora.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the principles of functioning of linguistic corpora and their applications in cognitive research.
- Knows and understands key theories of cognitive linguistics and their practical implications in corpus analysis.
- Knows and understands methods of analyzing corpus data, including the extraction and interpretation of linguistic patterns.
- Knows and understands the importance of empirical data in research on the conceptualization and use of language.

In terms of skills:

- The student is able to use linguistic corpora to analyze linguistic representations of conceptualizations.
- Can use corpus data analysis tools such as AntConc , Sketch Engine or NLTK.
- Is able to formulate research questions and conduct empirical research using corpus data.
- Can interpret the results of corpus analysis in the context of cognitive linguistics theory.

In terms of social competencies:

- The student is ready to cooperate in interdisciplinary research teams.
- Is ready to use the results of corpus research in practical linguistic and educational applications.
- Is ready to use linguistic data responsibly, taking into account the principles of data protection and research ethics.
- Is ready to develop his/her own competences in the use of digital technologies in humanities research.

The issue of free will and determinism in culture (II)

lecture

1 ECTS

Teaching methods	lectures with elements of discussion / text analysis / webinars with workshop elements
Method of verifying education	exam / activity during classes

OBJECTIVES

An analysis of the concepts of free will and determinism in various cultural, philosophical, and scientific traditions. An examination of the role of free will and determinism in shaping social, ethical, and cultural practices. Developing critical thinking skills in relation to contemporary debates on free will and determinism.

COURSE CONTENT

- Introduction to the issue. Definitions of free will and determinism. History of the debate: from antiquity to the present.
- Free will and determinism in philosophical traditions. Natural, theological, and logical determinism. Indeterminism and compatibilist concepts.
- Cultural contexts. Interpretations of free will in different cultures and religions. The role of free will and determinism in literature and art.
- Social and ethical consequences. Free will and moral responsibility. The importance of determinism in legal and social systems.
- Contemporary scientific perspectives. The neurobiology of free will. Determinism in physics and the social sciences.
- Summary and reflection. Current dilemmas and challenges related to the issue of free will.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the main theories of free will and determinism and their historical and cultural contexts.
- Understands how these concepts are interpreted in different philosophical and scientific traditions.
- Can identify key ethical disputes and dilemmas arising from the issues of free will and determinism.

In terms of skills:

- The student is able to analyze and compare different approaches to free will and determinism in the context of culture and science.
- Is able to formulate his/her own arguments and critically evaluate the positions of others.
- Is able to apply the concepts learned in the analysis of contemporary social and cultural problems.

In terms of social competencies:

- The student develops philosophical awareness in relation to the problems of free will and determinism.
- It is open to dialogue and a diversity of philosophical and cultural perspectives.
- Develops intellectual responsibility in the context of discussions on the ethical and social consequences of the issues discussed.

The issue of free will and determinism in culture (II)

exercises

1 ECTS

Teaching methods	workshops and group discussions / presentations
Method of verifying education	project / activity during classes

OBJECTIVES

An analysis of the concepts of free will and determinism in various cultural, philosophical, and scientific traditions. An examination of the role of free will and determinism in shaping social, ethical, and cultural practices. Developing critical thinking skills in relation to contemporary debates on free will and determinism.

COURSE CONTENT

- Introduction to the issue. Definitions of free will and determinism. History of the debate: from antiquity to the present.
- Free will and determinism in philosophical traditions. Natural, theological, and logical determinism. Indeterminism and compatibilist concepts.
- Cultural contexts. Interpretations of free will in different cultures and religions. The role of free will and determinism in literature and art.
- Social and ethical consequences. Free will and moral responsibility. The importance of determinism in legal and social systems.
- Contemporary scientific perspectives. The neurobiology of free will. Determinism in physics and the social sciences.
- Summary and reflection. Current dilemmas and challenges related to the issue of free will.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the main theories of free will and determinism and their historical and cultural contexts.
- Understands how these concepts are interpreted in different philosophical and scientific traditions.
- Can identify key ethical disputes and dilemmas arising from the issues of free will and determinism.

In terms of skills:

- The student is able to analyze and compare different approaches to free will and determinism in the context of culture and science.
- Is able to formulate his/her own arguments and critically evaluate the positions of others.
- Is able to apply the concepts learned in the analysis of contemporary social and cultural problems.

In terms of social competencies:

- The student develops philosophical awareness in relation to the problems of free will and determinism.
- It is open to dialogue and a diversity of philosophical and cultural perspectives.
- Develops intellectual responsibility in the context of discussions on the ethical and social consequences of the issues discussed.

Neurospeech Therapy

lecture

2 ECTS

Teaching methods	interactive lectures / group workshops / case studies / multimedia presentations and educational films
Method of verifying education	project / test / activity during classes

OBJECTIVES

Presentation of the theoretical and practical foundations of speech therapy as a field concerned with the diagnosis and treatment of neurological speech disorders. Discussion of the neurobiological mechanisms involved in speech and communication processes. Development of skills in the analysis and interpretation of clinical cases involving speech and language disorders. Introduction to the diagnostic tools and therapeutic methods used in speech therapy.

COURSE CONTENT

- Introduction to Neurologic Neurology: Scope, Objectives, and Importance.
- Neuroanatomy and neurophysiology of the speech apparatus: Brain speech centers, neural pathways.
- Neurological speech disorders: Aphasia, dysarthria, apraxia of speech, neurogenic stuttering.
- Diagnostic methods in neuro-speech therapy: Tests, observations, speech analysis.
- Neurological speech therapy: Approaches and techniques used in rehabilitation.
- Application of technology in neuro-speech therapy: Biofeedback , applications supporting therapy.
- Ethical issues in the work of a speech therapist : Cooperation with the patient and his family.
- Applications of speech therapy in cognitive science: Supporting communication in people with cognitive disorders.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the neurobiological mechanisms related to speech, language and communication processes.
- Knows and understands neurological speech disorders such as aphasia, dysarthria, stuttering and other communication disorders.
- Knows and understands the diagnostic and therapeutic methods used in neuro-speech therapy.
- Knows and understands the relationship between damage to the central nervous system and human communication functioning.

In terms of skills:

- The student is able to recognize symptoms of speech disorders with a neurological basis.
- Can analyze clinical cases and select appropriate diagnostic tools.
- Able to design speech therapy plans tailored to the patient's individual needs.
- Is able to use scientific literature and available sources to deepen knowledge in the field of neurological speech therapy.

In terms of social competencies:

- The student is ready to collaborate in interdisciplinary teams including neurologists, speech therapists and psychologists.
- Ethical approach to the diagnosis and treatment of people with speech disorders.
- Continuously improve your skills and expand your knowledge in the field of neuro-speech therapy.

Neurospeech Therapy

exercises

3 ECTS

Teaching methods	practical exercises / group workshops / individual work / clinical case analysis / practical exercises
Method of verifying education	project / test / activity during classes

OBJECTIVES

Presentation of the theoretical and practical foundations of speech therapy as a field concerned with the diagnosis and treatment of neurological speech disorders. Discussion of the neurobiological mechanisms involved in speech and communication processes. Development of skills in the analysis and interpretation of clinical cases involving speech and language disorders. Introduction to the diagnostic tools and therapeutic methods used in speech therapy.

COURSE CONTENT

- Introduction to Neurologic Neurology: Scope, Objectives, and Importance.
- Neuroanatomy and neurophysiology of the speech apparatus: Brain speech centers, neural pathways.
- Neurological speech disorders: Aphasia, dysarthria, apraxia of speech, neurogenic stuttering.
- Diagnostic methods in neuro-speech therapy: Tests, observations, speech analysis.
- Neurological speech therapy: Approaches and techniques used in rehabilitation.
- Application of technology in neuro-speech therapy: Biofeedback , applications supporting therapy.
- Ethical issues in the work of a speech therapist : Cooperation with the patient and his family.
- Applications of speech therapy in cognitive science: Supporting communication in people with cognitive disorders.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the neurobiological mechanisms related to speech, language and communication processes.
- Knows and understands neurological speech disorders such as aphasia, dysarthria, stuttering and other communication disorders.
- Knows and understands the diagnostic and therapeutic methods used in neuro-speech therapy.
- Knows and understands the relationship between damage to the central nervous system and human communication functioning.

In terms of skills:

- The student is able to recognize symptoms of speech disorders with a neurological basis.
- Can analyze clinical cases and select appropriate diagnostic tools.
- Able to design speech therapy plans tailored to the patient's individual needs.
- Is able to use scientific literature and available sources to deepen knowledge in the field of neurological speech therapy.

In terms of social competencies:

- The student is ready to collaborate in interdisciplinary teams including neurologists, speech therapists and psychologists.
- Ethical approach to the diagnosis and treatment of people with speech disorders.
- Continuously improve your skills and expand your knowledge in the field of neuro-speech therapy.

Discrete Mathematics

lecture

4 ECTS

Teaching methods	lectures / problem-solving method / group work / practical exercises / interactive mathematical exercises
Method of verifying education	test / design / assignments / activity in class

OBJECTIVES

An introduction to the fundamental concepts of discrete mathematics and their applications in cognitive science, including mathematical logic, graph theory, and combinatorics. An overview of discrete mathematics' applications in cognitive modeling and data analysis. Developing analytical thinking and problem-solving skills using discrete mathematics tools.

COURSE CONTENT

- Introduction to Discrete Mathematics: Basic Concepts, Importance in Cognitive Science.
- Mathematical Logic: Theorems, Proofs, Propositional Logic, and Quantifiers.
- Theory of sets and relations: Sets, set operations, relations and functions.
- Combinatorics: Permutations, combinations, inclusion-exclusion principle.
- Graph theory: Types of graphs, trees, graph algorithms.
- Probability in the context of discrete mathematics: Introduction, events and conditional probability.
- Algorithms and their complexity: Applications of discrete mathematics to the analysis of algorithms.
- Applications of discrete mathematics in cognitive science: Modeling of cognitive processes, analysis of neural networks.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the concepts of discrete mathematics, such as logic, relations, functions, graphs, combinatorics, permutations and probability.
- The student knows and understands the applications of discrete mathematics in various fields, including data analysis, cryptography, and algorithm theory.
- The student knows and understands the relationships between mathematical structures and their applications in cognitive science.

In terms of skills:

- The student is able to model problems in the field of cognitive science using the tools of discrete mathematics.
- Can solve tasks requiring the use of logic, graph theory and combinatorics.
- Is able to analyze and interpret the results of mathematical analyses in the context of cognitive processes.
- Can use appropriate mathematical methods to design algorithms and analyze their complexity.

In terms of social competencies:

- The student is ready to work in teams on projects requiring the use of discrete mathematics.
- Is ready to independently develop knowledge and skills in mathematics and its applications.
- Is ready to critically analyze data and draw conclusions based on sound mathematical foundations.

Behavioral Economics

exercises

2 ECTS

Teaching methods	lectures / didactic discussion / case analysis / preparing essays and reports / research project
Method of verifying education	project / test / assignments / activity in class

OBJECTIVES

A discussion of the psychological theories and mechanisms that influence economic decisions.
An analysis of deviations from the assumptions of classical economics and their implications for economic theory and practice. An introduction to the research methods used in behavioral economics and experimental design. A presentation of the applications of behavioral economics in various fields, such as marketing, public policy, and management.

COURSE CONTENT

- Introduction to Behavioral Economics: Origins, basic assumptions, differences from classical economics.
- Heuristics and cognitive biases: Types of heuristics, their impact on decisions, and examples in everyday situations.
- Prospect theory: Decisions under risk and uncertainty.
- Bounded rationality: Decision-making mechanisms in the context of cognitive and information constraints.
- The influence of emotions on economic decisions: The role of affect and emotions in decision-making processes.
- Experiments in behavioral economics: Research design, analysis of results, and their interpretation.
- Applications of behavioral economics: Marketing, management, public policy.
- Ethical aspects of behavioral economics: The influence of manipulation on the decisions of individuals and groups.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows the concepts and theories of behavioral economics, including bounded rationality, heuristics, and cognitive biases.
- Knows the differences between classical and behavioral economic theory.
- Knows the psychological mechanisms influencing economic decisions and their social consequences.
- Knows the application of behavioral economics theory in practice, including in the design of marketing policies and strategies.

In terms of skills:

- The student is able to analyze and interpret economic behavior from the perspective of behavioral economics.
- Is able to design experimental studies to test hypotheses about economic behavior.
- Can use knowledge of behavioral economics to solve practical problems, such as increasing the effectiveness of public policies or designing marketing strategies.
- Is able to identify and assess cognitive biases and their impact on the decisions of individuals and organizations.

In terms of social competencies:

- The student is ready to critically evaluate the effects of economic decisions in a social and ethical context.
- He is ready to collaborate in interdisciplinary teams on projects in the field of behavioral economics.
- Is ready to independently improve knowledge and skills in a dynamically developing field.

Legal Implications of Cognitive Science

exercises

1 ECTS

Teaching methods	interactive lectures / legal documents analysis / group dscussions on ethical and legal problems
Method of verifying education	project / test / assignments / activity in class

OBJECTIVES

A presentation of legal issues related to the development of cognitive science, artificial intelligence, and cognitive technologies. A discussion of legal liability, data protection, intellectual property rights, and ethical regulations in the context of cognitive science research. Developing skills in analyzing complex legal problems in science and technology. An introduction to international law in the context of artificial intelligence and intervention in human cognitive processes.

COURSE CONTENT

- Introduction to legal aspects of cognitive science: History, scope, and current challenges.
- Artificial Intelligence Regulation: European Union Law and Other Legal Systems.
- Legal liability in cognitive technology applications: Issues related to errors and side effects of technology.
- Protection of personal data and privacy: GDPR and other international regulations.
- Intellectual property rights: Issues related to patenting algorithms and cognitive technologies.
- Ethics and law: Ethical principles in the context of interference in human cognitive processes.
- Cognitive technologies and international law: Examples of cooperation and regulation at the global level.
- Case Studies: Analysis of Selected Legal Cases Related to Cognitive Science.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the main legal regulations regarding artificial intelligence, data protection and research ethics.
- Knows and understands issues related to legal liability for technologies using cognitive knowledge.
- Knows and understands legal and ethical concepts related to interference with human cognitive processes.
- Knows and understands the international legal framework regarding the development and application of artificial intelligence.

In terms of skills:

- The student is able to analyze and interpret legal provisions in the context of cognitive science and cognitive technologies.
- Is able to recognize potential legal threats related to the application of cognitive science in practice.
- Is able to develop legal risk management strategies in research and technology projects.
- Is able to lead an interdisciplinary discussion on the legal and ethical implications of cognitive science.

In terms of social competencies:

- The student is ready to make responsible decisions related to legal issues in science and technology.
- He is willing to collaborate with experts in law, science and social sciences to solve complex problems.
- He is ready to promote an ethical approach to the application of cognitive science knowledge in practice.
- It is ready to act in accordance with the principles of sustainable development and protection of human rights.

Programming Languages

workshops

2 ECTS

Teaching methods	lectures with code demonstrations / computer labs / group projects / programming exercises
Method of verifying education	project / test / assignments / activity in class

OBJECTIVES

Introduce students to the fundamental concepts of programming languages, including syntax, semantics, and the differences between various programming paradigms (procedural, object-oriented, functional). Discuss the relationship between programming languages and cognitive processes, including modeling cognitive processes through code. Develop practical programming skills in one or more popular languages (e.g., Python, Java, C++). Prepare students for work with programming tools and introduce them to creating and testing computer applications.

COURSE CONTENT

- Introduction to programming languages: History, classification, applications.
- Basic elements of programming languages: Variables, data types, operators, control statements.
- Programming paradigms: Procedural, object-oriented, functional, logical.
- Selected programming language: Syntax and semantics (e.g., Python, Java, C++). Creating functions, modules, and classes.
- Programming Practice: Creating an App Step by Step.
- Debugging and testing code: Tools and techniques.
- Applications to cognitive science: Programming simulations and cognitive models.
- Application Development: Introduction to Frameworks and Libraries.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the main programming paradigms and their characteristics.
- Knows and understands the syntactic and semantic structures of programming languages.
- Knows and understands the principles of designing and implementing computer code in selected programming languages.
- Knows and understands the applications of programming languages in cognitive science, including the modeling of cognitive processes.

In terms of skills:

- The student is able to write and debug code in selected programming languages.
- Can analyze and optimize code for performance and readability.
- Can create simple programs, applications and simulation models.
- Can use programming support tools such as version control systems, IDEs and external libraries.

In terms of social competencies:

- The student is ready to collaborate in project teams on joint solutions to programming problems.
- Is ready to systematically develop skills in new technologies and programming languages.
- Is ready to take responsibility for the quality and ethical aspects of the software being created.
- Is ready to develop innovative approaches to problem-solving using programming tools.

Mental Experiments in Cognitive Science

project

2 ECTS

Teaching methods	interactive lectures / text analysis / design workshops / group work on selected philosophical problems
Method of verifying education	project / test / assignments / activity in class

OBJECTIVES

A discussion of the role of thought experiments in research on the mind, cognition, and artificial intelligence. An analysis of the most famous thought experiments, such as the Chinese room, brain in a vat, and philosophical zombies , and their impact on the development of cognitive science. Developing skills in designing and critically analyzing thought experiments in philosophical, scientific, and technological contexts. Using thought experiments to explore new research problems and generate hypotheses.

COURSE CONTENT

- Introduction to Thought Experiments. Definition, History, and Importance in Science and Philosophy.
- Classic thought experiments. Brain in a vat (Hilary Putnam). The Chinese room (John Searle). Philosophical zombies (David Chalmers).
- Thought experiments and artificial intelligence. Turing problems, tests for AI consciousness.
- A Critique of Thought Experiments. Limitations and Alternative Approaches.
- Designing Thought Experiments. Principles, Objectives, and Methodology.
- Thought experiments in interdisciplinary research. Examples from neurobiology, psychology, and computer science.
- Contemporary thought experiments. An analysis of new examples and their impact on research.

DESCRIPTION OF THE EXPECTED LEARNING RESULTS

In terms of knowledge:

- The student knows and understands the concepts and goals of thought experiments in the context of cognitive science.
- Knows and understands the most important classical thought experiments and their significance for the philosophy of mind and artificial intelligence research.
- Knows and understands various approaches to the analysis of thought experiments, including their criticisms and limitations.
- Knows and understands the use of thought experiments in developing scientific and philosophical theories.

In terms of skills:

- The student is able to critically analyze thought experiments and evaluate their theoretical implications.
- Can design his/her own thought experiments in response to specific research problems.
- Can discuss the philosophical and scientific implications of selected thought experiments.
- Can use thought experiments as tools to generate hypotheses and inspire empirical research.

In terms of social competencies:

- The student is ready for open dialogue on complex and controversial philosophical issues.
- Is ready to think critically and formulate independent opinions based on theoretical analysis.
- He is willing to collaborate in research teams to develop thought experiments.
- Is ready to recognize ethical aspects arising from the analyzed experiments.