

EFEKTY UCZENIA SIĘ I TREŚCI PROGRAMOWE ZAJĘĆ

Kierunek: **Language, Mind, Technology**

Poziom studiów: **studia drugiego stopnia**

Course name: **Foreign language course - Spanish**

**On successful completion of this course, a student
in terms of skills:**

1. knows, understands and can use grammatical structures in a foreign language
2. understands/reads texts on topics corresponding to selected thematic areas
3. is able to correctly use vocabulary from selected thematic ranges
4. is able to formulate linguistically correct statements on selected topics
5. is ready to work in a group, communicate effectively with other people
6. is able to use learning aids and the latest information technologies in the field of Spanish language and culture

Course learning content:

Vocabulary from selected thematic blocks, such as: personal profile, family members, likes and dislikes, physical and mental states, colours, demonymes, jobs, description of people and things, etc.

Grammatical/lexical exercises developing and checking the ability to properly use language structures and grammar of a foreign language, such as: use of SER & ESTAR & TENER verbs, tense - Presente de Indicativo, verb GUSTAR and verbs like GUSTAR

Exercises developing oral statements within certain thematic blocks

Developing communication skills within a group

Course name: **Foreign language course - German**

**On successful completion of this course, a student
in terms of knowledge:**

1. understands the vocabulary used in the lecturer's statements; is familiar with and comprehends the grammatical structures necessary for expressing opinions.

in terms of skills:

1. can take notes from listening, communicate with the surroundings, articulate opinions clearly, engage in casual conversations with other German speakers, react in urgent situations, defend and exchange views. Can write detailed texts, essays, short stories, formal and informal letters, as well as simple critical sketches.

in terms of social competences:

1. is ready for self-directed learning, ready to engage in discussions at their language proficiency level. Is prepared to offer advice on topics and matters within their knowledge.

Course learning content:

Getting to know each other - welcoming rituals, describing behaviors, addressing sensitive topics.

Places of residence - city and village, family home, issues related to large cities.

Leisure time - intentions and their realization, extreme sports.

Daily life - daily schedule, timetable, weekends, celebrations, nutrition.

Education and profession - characteristics of professions, career advice, job offers.

Interpersonal relationships - giving advice, handling disputes, and their resolution, human personality types.

Media - communication issues, computer vs. book, window to the world or a dead-end street.

Course name: **Trends and advances in language science**

**On successful completion of this course, a student
in terms of knowledge:**

1. has knowledge of the current state of language research, taking into account such branches of linguistics as syntax, pragmatics, translation research, phonetics and phonology, psycholinguistics, sociolinguistics, and language and technology research.
2. has knowledge of modern developments and trends in interdisciplinary language research, including such branches of linguistics as syntax, pragmatics, translation research, phonetics and phonology, psycholinguistics, sociolinguistics, and language and technology research.

in terms of skills:

1. can critically present the state of linguistic research and refer to the scientific discourse.

2. can use their knowledge of research methods used in various branches of linguistics in order to try to prepare a research project on a selected linguistic topic that goes beyond the current (traditional) framework of the selected branch of linguistics.

in terms of social competences:

1. is able to evaluate available scientific evidence and update their knowledge and views on a given linguistic phenomenon in light of this evidence

Course learning content:

State of the art and modern developments in the field of phonetics and phonology
State of the art and modern developments in the field of syntax
State of the art and modern developments in the field of pragmatics
State of the art and modern developments in the field of sociolinguistics
State of the art and modern developments in the field of psycholinguistics
State of the art and modern developments in the field of translation research
State of the art and modern developments in the field of language and technology

Course name: **Elements of statistics in R**

On successful completion of this course, a student

in terms of knowledge:

1. knows basic statistical concepts; can present empirical distribution of a variable under study in tabular and graphical form; knows basic descriptive statistics and can interpret them.

2. knows basic concepts of probability theory, applicable to statistics.

3. knows and can apply basic statistical tests used in linguistics: t-test and related, chi-squared test, correlation test, ANOVA, linear regression.

in terms of skills:

1. can import, transform and visualize data in R statistical environment.

2. can write up a conducted statistical procedure, as well as interpret write-ups of statistical procedures conducted by other researchers.

Course learning content:

Basic statistical concepts
Basics of the R statistical environment
Descriptive statistics
Introduction to probability
Estimating unknown quantities from samples
Hypothesis testing
Continuous data analysis
Categorical data analysis

Course name: **Academic discourse**

On successful completion of this course, a student

in terms of knowledge:

1. knows academic language and its discourse conventions - both in writing and in speech

2. knows the WA Stylesheet and understands the rationale behind it

in terms of skills:

1. is able to critically read an academic text and select information that is relevant to their own study

2. is able to plan and conduct the writing process in an organized way according to the stages planned in advance

3. is able to produce sections of an academic text in a stylistically correct and communicative way

4. is able to competently prepare public speeches in terms of their visual and academic content

5. is able to present their speech in a communicative and visually effective fashion

in terms of social competences:

1. is able to cooperate with prospective employers

Course learning content:

reading and analysing an academic text in a critical and effective way
brainstorming and formulating hypotheses
planning the work in stages
writing sections of an academic text,
critical proofreading of one's own and peers' academic texts,
describing language data,
preparing a public speech: structure and visualisation of an academic presentation,
presenting experimental data: content, structure and visualisation,

performing publically: body language and other good speaker's skills,
participating in a study visit

Course name: **Natural language processing**

**On successful completion of this course, a student
in terms of knowledge:**

1. knows the basic applications of natural language processing, knows the limits of technological possibilities, can list the basic techniques of language processing
2. knows the concept of formal grammar, can design his own grammar and modify an existing one, implements context-free grammar in Python.
3. knows the techniques of splitting a text into sentences and words, understands the challenges associated with it (especially in languages that do not use spaces), can define the rules of splitting into sentences and words.
4. knows what the morphological analysis of a text is, knows electronic morphological dictionaries for various languages, knows disambiguation techniques.
5. knows the most popular NLP toolkits, can install and run them.
6. knows the applications of machine learning techniques in language processing, can implement the Bayesian classifier using a ready
7. knows statistical regression techniques and their application in natural language processing.
8. understands the concept and knows the use of neural networks in language modeling and classification problems.
9. knows statistical methods of language modeling, can train a model of any language based on text resources.
10. knows the techniques of automatic spell checking, can run a spell checker.
11. understands the concept of shallow parsing, can run a shallow parser.
12. knows the concept of deep parsing and syntax analysis. Can run a deep parser and analyse its results.
13. knows the techniques of automatic web scraping of language resources

in terms of skills:

1. can write a regular expression, use regular expressions for practical tasks in the field of text processing, use regular expressions in Python.
2. can run a Linux shell, knows the basic commands for text processing under Linux, understands the concept of the command pipeline.
3. can run a deep parser and analyse its results.

in terms of social competences:

1. is prepared and eager to cooperate with prospective employers.

Course learning content:

Applications of natural language processing, basic terminology related to this field, the limits of NLP, running NLP programs.

Regular expressions - defining the language of regular expressions, using it to search and modify text. Grammars and formal languages, building your own contextual grammar, using formal grammars for text analysis.

Linux commands, the concept of a pipe, application in word processing.

Text segmentation - splitting into sentences (segments) and words, SRX formalism, tokenization algorithms.

Morphological analysis - morphological dictionaries, disambiguation problem, running tools for morphological analysis.

NLP Toolkits - overview and application of the most popular NLP toolkits available for Python: NLTK and spaCy.

Introduction to machine learning, the use of machine learning in language processing, Bayes classifier. Linear and logistic regression methods in natural language processing with examples of their practical application.

The concept of neural networks, their role and application in natural language processing.

Statistical methods of language modelling and their practical application.

The problem of automatic spelling correction, the use of spelling correction programs in practice, the efficiency of algorithms

Shallow parsing as an efficient method of superficial text analysis with applications.

Deep parsing, differences from shallow parsing, application and examples.

Automated download of linguistic resources from the Internet, practical exercises.

Participation in a study visit.

Course name: **Integrated skills**

On successful completion of this course, a student in terms of knowledge:

1. understands written academic texts in English at an advanced level, related to themes defined by the course.
2. understands oral texts in English within the thematic areas defined by the course.

in terms of skills:

1. forms fluent statements in English at an advanced level, while maintaining control over grammatical structures and phonetics.
2. critically analyses written academic texts in English at an advanced level related to themes defined by the course.
3. critically analyses oral texts in English within the thematic areas defined by the course.
4. maintains a type of register appropriate to the context at an advanced level.
5. uses a wide range of vocabulary at an advanced level.
6. conducts self-assessment and reflects on their own progress in learning English.
7. carries out effective and independent research on themes defined by the course.

in terms of social competences:

1. conducts self-assessment and reflect on their own progress in learning English.
2. applies a variety of language learning strategies.

Course learning content:

Techniques of studying at the academic level.

Introduction, analysis and overview of topics related to the following thematic areas: Education, Science & Technology, Psychology, Politics & Society, Work & Careers, Ethical issues, Health & lifestyle, Current trends in science

Introducing and expanding vocabulary related to the following thematic areas: Education, Science & Technology, Psychology, Politics & Society, Work & Careers, Ethical issues, Health & lifestyle, Current trends in science

Analysis of written and spoken texts related to the thematic areas discussed during the course.

Planning and conducting discussions and presentations related to topics defined by the course (Education, Science & Technology, Psychology, Politics & Society, Work & Careers, Ethical issues, Health & lifestyle, Current trends in science)

Course name: **Clinical linguistics**

On successful completion of this course, a student in terms of knowledge:

1. is familiar with basic symptoms of selected speech and language disorders
2. is familiar with the etiology and neurobiological basis of a selected language disorder
3. is familiar with selected methods used in the treatment of language disorders

in terms of skills:

1. can list the basic symptoms of selected speech and language disorders
2. can present the etiology and neurobiological basis of a selected language disorder
3. can present selected methods used in the treatment of language disorders
4. can interpret the results of research on speech and language disorders

in terms of social competences:

1. can critically evaluate the topic under discussion
2. can provide constructive comments and respond to criticism

Course learning content:

Aphasia: Symptoms, etiology and neurobiological basis

Therapeutic tools used in aphasia

Dyslexia: Symptoms, etiology and neurobiological basis

Therapeutic tools used in dyslexia

Autism: Symptoms, etiology and neurobiological basis

Therapeutic tools used in autism

Schizophrenia: Symptoms, etiology and neurobiological basis

Therapeutic tools used in schizophrenia

Neurobiological changes in the aging brain

Language disorders in a bilingual perspective

Course name: **Programming in Python**

**On successful completion of this course, a student
in terms of knowledge:**

1. knows how to create complex programs, using functions and self-created modules.
2. understands the concept of functional programming and knows how to use it

in terms of skills:

1. can use regular expressions and create advanced text analysis tools; can read text from a file and save to a file.
2. can create objects, use classes and class-inheritance
3. can work with a database and create a Python script to read from database and write to database.

Course learning content:

Keyword function arguments, default function arguments, *args function arguments, **kwargs function arguments

General variables & local variables (function example), list unpacking, complex list sorting, anonymous function and Lambda expression, map() function.

List comprehensions, dictionary comprehensions, dictionary sorting.

Recursion.

Using divide-and-conquer algorithm (DAC), ternary operator.

Debugging, exceptions, handling exceptions and raising exceptions.

Input-output operations, reading from a file, writing to a file.

Regular expressions.

Object-Oriented-Programming (OOP), creating and using classes. Inheritance. Encapsulation. Creating modules.

Working with a database (read and write operations using Python).

Course name: **Theme seminar**

**On successful completion of this course, a student
in terms of knowledge:**

1. has in-depth knowledge of selected aspects of linguistics
2. has knowledge about different research and interpretation methods
3. has knowledge about trends in linguistic and interdisciplinary research
4. knows the rules of copyright protection

in terms of skills:

1. is able to develop analytic skills and use them in research work
2. is able to integrate knowledge from various disciplines
3. is able to draw critical conclusions from the discussed literature, argue for them and evaluate the oral statements of other participants in the discussion
4. is able to write a research text in English

in terms of social competences:

1. is able to draw critical conclusions from the discussed literature and update their views in light of new evidence or when exchanging arguments with other in a scientific discussion

Course learning content:

presentation of and discussion on topics serving the expansion of students' knowledge in the field of linguistics

reading and individual analysis of subject literature developing students' in-depth knowledge of selected topics in the field of linguistics

searching, selecting and synthesis of information, working on definitions of linguistics terms

rules of protection of personal data of subjects taking part in experiments

Course name: **Lab and fieldwork-oriented research practice**

**On successful completion of this course, a student
in terms of knowledge:**

1. has knowledge of advanced language research methodology
2. has knowledge of the ethics of research involving humans (physical or psychological intervention) and the rules regarding the processing of personal data
3. has knowledge of organizational and administrative aspects related to the management of the laboratory

in terms of skills:

1. is able to use knowledge and methodological skills in order to learn, popularize and revitalize a language, in particular the languages of ethnic minorities and endangered languages
2. can use research tools in a selected laboratory

3. can cooperate in a research team

in terms of social competences:

1. is aware of organizational and administrative aspects related to research laboratory management
2. is aware of and reflects on the ethics of research involving humans (physical or psychological intervention) and the rules regarding the processing of personal data
3. is able to effectively cooperate in a research team
4. is aware of and reflects on the need to popularize and revitalize a language, in particular the languages of ethnic minorities and endangered languages

Course learning content:

research methodology in a selected laboratory (e.g. behavioral research, palatographic research, electrophysiological research, eye-tracking research)
laboratory management and administration
ethics in human research
principles of personal data protection of a research participant
using an interdisciplinary research methodology to learn, popularize and revitalize the languages of ethnic minorities and endangered languages

Course name: **Introduction to bilingual brain**

On successful completion of this course, a student

in terms of knowledge:

1. knows the anatomy, structures and functions of the brain in relation to perception, representation, understanding of language, and biological and physiological processes and mechanisms related to language processing in bilinguals
2. knows the structural and functional similarities and differences of monolingual and bilingual brains, takes into account factors (e.g., second language acquisition age, proficiency level, second language acquisition modality) that affect the density of grey matter structures and the quality of white matter pathways in bilingual brains
3. knows the dynamics of neuroplastic processes underpinning qualitative changes in bilingual brains; understands the 'foreign language effect' as represented in recent neuro-science research

in terms of skills:

1. can formulate appropriate questions regarding the monolingual and bilingual brain's anatomy, structure and functions and knows how to convert research findings into hypotheses;
2. holistically understands and interprets the results of neuroimaging studies showing the cortical and subcortical structures involved in the processing of the first and second language in the bilingual brains
3. can interpret research results and formulate conclusions related to the study of linguistic processes in the brains of bilinguals

Course learning content:

An introduction to the anatomy of the bilingual brain
Anatomy and physiology of the central nervous system
Chemistry and Electricity - Brain Languages
Cortical and subcortical centers involved in language processing - universal and L1, L2 specific
Cyto-architectural organization of the neocortex
Similarities and differences in the structure of grey and white matter in the Universal Language network of bilingual people
Factors influencing differences in gray matter density and white matter pathway networks in bilingual brains
Neuro-plasticity of brain structures in bilingual people
The degree of embodiment (embodiment) of the second language - a review of neuroimaging research
The Foreign Language Effect - neurological research perspective

Course name: **Biological and Evolutionary Roots of Language**

On successful completion of this course, a student

in terms of knowledge:

1. knows basic concepts in anthropogenesis, as well as the development and the evolution of speech;
2. is familiar with key concepts in the domain of ontogeny of speech and the neurobiological correlates of language
3. knows the basic similarities and differences between human and non-human animal communication;
4. is familiar with the main trends in computer modelling of language evolution

in terms of skills:

1. is able to write, in collaboration with others, a short academic essay of between 600 and 1500 words on a selected topic related to the subject of the course and present it in class
2. is able to integrate information from the scope of human phylogeny and ontogeny as well as other areas of science (neurobiology of speech, studies of animal communication/language, genetics, language evolution modeling) in order to describe, according to the current state of knowledge, the possible biological and evolutionary foundations of speech and language.

in terms of social competences:

1. reflects on the acquired knowledge and the need to update it in light of new scientific evidence
2. cooperates with others in a group; can lead discussions

Course learning content:

Basic facts about the theory of evolution
Human phylogeny and theories of language origin
Genes FOXP2 and CNTNAP2 and speech
Neurobiological correlates of language and speech.
Typical and atypical language acquisition in children
Human language versus non-human animal communication
Language evolution as a system – computer models simulating evolution
Principles of writing a scientific essay; teamwork
Student presentations

Course name: **Introduction to computer science and programming**

On successful completion of this course, a student

in terms of knowledge:

1. knows the basic terminology and has the ability to convert decimal numbers to binary and vice versa; understands the computer's working pattern; knows and understands the concept of low-level and high-level languages.
2. knows how to present example tasks in the form of flowcharts
3. knows the basics of Git and is able to use them
4. understands the concept of data structure; distinguishes elementary data structures, at least lists, tuples, dictionaries

in terms of skills:

1. concerning C ++, uses data types and control structures; can write a simple program in C ++.
2. concerning Python, uses data types and control structures; can write a simple program in Python.
3. can present a simple algorithm in the form of a flowchart and implement it in Python or C++

Course learning content:

Terminology, notion of algorithm, brute-force algorithm, basic computer architecture.
Computer language, number systems.
Print function, primitive types (numbers, strings, booleans), operators.
Basic Window's command prompt commands. Git installation, GitHub account creation, basics of working with Git.
Input function. Comments.
Conditional statements. Unicode & ASCII.
Methods vs Functions. String methods.
Iteration, loops. Range function.
Lists, tuples, dictionaries.
Creating own functions
Getting started with C++

Course name: **M.A. Seminar**

On successful completion of this course, a student

in terms of knowledge:

1. has in-depth knowledge of selected aspects of linguistics
2. has knowledge about the MA thesis structure and academic writing style
3. knows the rules of copyright protection

in terms of skills:

1. is able to read with understanding and properly analyze (critically) scientific texts (articles, monographs) in the field of selected aspects of linguistics
2. is able to place this knowledge in the broader context of English linguistics and other fields of science and culture

3. is able to draw critical conclusions from the discussed texts and evaluate the oral statements of other participants in the discussion
4. is able to collaborate on the preparation of a joint research project
5. is able to present a selected scientific problem and conduct a discussion on the problem
6. is able to use the acquired skills of critical reading of scientific texts and in-depth analysis when writing a thesis, while being aware of the importance of copyright laws
7. Is able to write a master's thesis on a selected topic in the field of English linguistics with the appropriate style, structure and format

in terms of social competences:

1. is able to place the acquired knowledge in the broader context of English linguistics and other fields of science and culture
2. is able to use the acquired skills of critical reading of scientific texts and in-depth analysis when writing a thesis, while being aware of the importance of copyright laws

Course learning content:

The content of MA seminar will be specified by the MA supervisor.

Course name: **Specialized statistical tools for linguists**

On successful completion of this course, a student

in terms of knowledge:

1. is familiar with a variety of exploratory and confirmatory statistical methods, including mixed-effects linear and binary regression modeling, conditional inference trees and random forests, cluster analysis, multi-dimensional scaling, principal component analysis and factor analysis.

in terms of skills:

1. can build and interpret mixed-effects linear and binomial logistic regression models
2. can apply conditional inference trees and random forests
3. can perform cluster analysis
4. can make maps and perform multidimensional scaling
5. can perform Principle Component Analysis and Factor Analysis

Course learning content:

Linear regression
Binomial logistic regression
Mixed-effects regression
Conditional inference trees and random forests
Cluster analysis
Multidimensional scaling
Principal Component Analysis & Factor Analysis

Course name: **Debating and argumentation**

On successful completion of this course, a student

in terms of knowledge:

1. knows the history of debate and its significance for the civil society
2. is familiar with the principles of proper argumentation, debate formats and basic logical fallacies

in terms of skills:

1. can write down and present logical arguments for a debate based on reliable scientific data and sources from the field of linguistics or other disciplines

in terms of social competences:

1. can prepare and conduct a full debate on a chosen linguistic or social topic, working as a team member and respecting others

Course learning content:

The history of debate; debate as an element of the civil society
Propositions and their classification
Evidence and data in a debate
Warrants and the Toulmin Model
Types of arguments
Formal and informal logical fallacies
The Oxford Union debate format
Carl Popper debate format
Searching for data and resources
Student debate sessions

Course name: **Artificial intelligence**

On successful completion of this course, a student in terms of knowledge:

1. knows the basic terms used in the field of Artificial Intelligence (AI).
2. knows the history of the field of AI.knows modern practical applications of AI and their socio-economic challenges.
3. has general knowledge of the inner workings of the most popular machine learning algorithms as well as the technologies used for working with them.
4. has general knowledge of conducting AI Research & Development (R&D), including agile software development.

in terms of skills:

1. can create an AI R&D project proposal.
2. can present an AI R&D project proposal to a wide target audience and defend his/her position.

in terms of social competences:

1. is ready to manage his/her own AI R&D work as well as the work of a team.
2. is ready to follow and share with others the best practices for working with AI.
3. is ready to self-assess his/her knowledge and skills as well as to develop them according to professional requirements.

Course learning content:

Introduction to Artificial Intelligence (AI): basic terms, history of the field, disciplines that contributed ideas and methods to AI

State of the art and practical applications of AI in science and businessSocioeconomic challenges (e.g. discrimination and increasing inequality, human error vs. machine error, job losses, carbon footprint)

Machine learning approaches (supervised, semi-supervised, unsupervised, reinforced, active)Most popular problems solved with machine learning (regression, classification, clustering, anomaly detection, time series analysis)

Machine learning model life cycle (data collection, data labelling, data & code versioning, data exploration & visualization, model training, inference)Most popular machine learning algorithms (linear regression, logistic regression, naïve Bayes classifier, support vector machine, decision trees and random forests, gradient boosting, k-nearest neighbours, k-means, probabilistic graphical models)

Deep learning (artificial neural networks: feedforward, recurrent, convolutional, LSTM)Natural language processing: normalisation, n-gram models, sentiment analysis, vector semantics & embedding, neural language models, machine translation, written language generation, speech recognition and synthesis, automated scoring of spoken & written language)

Practical aspects of model operationalisation (deployment, monitoring, scaling, managing data life cycle)Cloud data processing and machine learning (advantages & disadvantages, providers, practical considerations, e.g. best virtual machines for a given problem)Creating in-house models vs. reusing existing ones, incl. managed cloud services

Legal aspects of R&D in Poland; intellectual property and patentsAI R&D project life cycle; frameworks for managing such projects (e.g. TDSP)Agile software development methods (Scrum, Kanban), as used in the field of AI

Practical challenges and most common mistakes in AI R&D projectsFormal and informal requirements for model transparency in selected industriesLegal aspects of data processing (GDPR, RODO, problematic cases)Managing R&D personnel (researchers, machine learning engineers)Administrative aspects of R&D in Poland (employment type, creative work, 50% revenue-earning costs)Industrial visit (AI R&D unit)

Critical analysis of example R&D projects (in science and business)Presentation techniques for R&D project proposals (in science and business)Creating & presenting your own AI R&D project proposal