



## Subject card

Subject name and code	Natural Language Processing, PG_00053344						
Field of study	Biomedical Engineering						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
Education level	second-cycle studies	Subject group			Optional subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jan Daciuk				
	Teachers		dr hab. inż. Jan Daciuk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		2.0		18.0	50
Subject objectives	The purpose of this subject is to familiarize students with basic techniques used in natural language processing and to prepare them for work on development of applications for that domain.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W01] knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study	knows and understands profoundly mathematics in the scope that is necessary for formulating and solving complex issues in natural language processing			[SW1] Assessment of factual knowledge		
	[K7_W08] knows and understands, to an increased extent, the fundamental dilemmas of modern civilisation, the main development trends of scientific disciplines relevant to the field of education	Knows and profoundly understands the influence of natural language processing techniques on contemporary civilization and its current development trends.			[SW1] Assessment of factual knowledge		
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems	is ready for critical assessment of incoming contents, accepting significance of knowledge in solving cognitive and practical problems in scope of the natural language processing			[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	can plan and can conduct experiments concerning natural language processing, interpret the results and draw conclusions			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		

Subject contents	<p>Lecture:</p> <ul style="list-style-type: none"> <li>Lexicons: data structures, morphology.</li> <li>Vector representation of semantics.</li> <li>Document retrieval.</li> <li>Spelling correction.</li> <li>POS tagging.</li> <li>Syntax.</li> <li>Parsing.</li> <li>Dialogue systems.</li> <li>Question answering.</li> <li>Reference resolution.</li> <li>Summarization.</li> <li>Machine translation.</li> </ul> <p>Project:</p> <ul style="list-style-type: none"> <li>Text preprocessing.</li> <li>Morphology.</li> <li>Document retrieval.</li> <li>Parsing.</li> <li>Dialogue system.</li> </ul>											
Prerequisites and co-requisites	Knowledge of higher mathematics and machine learning, programming skills, especially in Python. Basic knowledge of Polish linguistics is a plus.											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>projects</td> <td>50.0%</td> <td>50.0%</td> </tr> <tr> <td>exam</td> <td>50.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	projects	50.0%	50.0%	exam	50.0%	50.0%
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Recommended reading	Basic literature	<p>Daniel Jurafsky, James H. Martin, <i>Speech and Language Processing. An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, Second Edition</i>, Pearson/Prentice Hall, 2009. Third edition draft: <a href="https://web.stanford.edu/~jurafsky/slp3/">https://web.stanford.edu/~jurafsky/slp3/</a></p> <p>Kenneth R. Beesley, Lauri Karttunen, <i>Finite State Morphology</i>, CSLI Publications, 2003.</p> <p>Rayesh Arumugam, Rajalingappa Shanmugamani, <i>Hands-on Natural Language Processing with Python. A practical guide to applying deep learning architectures to your NLP applications</i>, Packt, 2018.</p> <p>Paul Deitel, Harvey Deitel, <i>Python for Programmers: with Big Data and Artificial Intelligence Case Studies</i>, Pearson Education, Inc, publishing as Prentice Hall, 2019</p>										
	Supplementary literature	<p>Alicja Nagórko, <i>Podręczna gramatyka języka polskiego</i>, Wydawnictwo Naukowe PWN, Warszawa, 2012.</p> <p>Zygmunt Saloni, Włodzimierz Gruszczyński, Marcin Woliński, Robert Wołosz, <i>Grammatical Dictionary of Polish - on-line version</i>.</p>										
	eResources addresses	<p>Podstawowe</p> <p><a href="https://web.stanford.edu/~jurafsky/slp3">https://web.stanford.edu/~jurafsky/slp3</a> - Draft of the third edition of Daniel Jurafsky, James H. Martin, <i>Speech and Language Processing. An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition</i></p> <p>Uzupełniające</p> <p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											

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