Subject card

Subject name and code	Natural Language Processing, PG_00053344					
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering					
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024	
Education level	second-cycle studies		Subject group		Optional subject group / Subject group related to scientific research in the field of study	
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	Department of Intelligent Interactive Systems -> 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	Learn the fundamentals of natural language processing.		

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 evaluation of received contents, accepting significance of knowledge in solving research and practical problems in the domain of natural language processing	[SK2] Assessment of progress of work / [SK5] Assessment of ability to solve problems that arise in practice
	[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 profoundly understands mathematics in the extent necessary for formulating and solving complex aspects concerning natural language processing	[SW1] Assessment of factual knowledge / [SW3] Assessment of knowledge contained in written work and projects
	[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 conduct experiments in natural language processing, including measurements and computer simulations, to interpret the results and draw the conclusions	[SU1] Assessment of task fulfilment / [SU4] Assessment of ability to use methods and tools
	[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 fundamental dilemmas of contemporary civilization, main trends in scientific disciplines significant for natural language processing	[SW1] Assessment of factual knowledge

Subject contents	Lecture: 1. Segmentation 2. Lexicon 3. Embedding 4. Text retrieval 5. Spelling correction 6. Tagging 7. Syntax 8. Parsing 9. Dialog systems 10. Question answering 11. Coreference resolution 12. Summarization 13. Machine translation		
Prerequisites and co-requisites	Knowledge of mathematics, practical programming skills in Python.		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	sum of the above	50.0%	0.0%
	evaluation of 5 projects	40.0%	50.0%
	exam	40.0%	50.0%

Recommended reading	Basic literature	1. Daniel Jurafsky, James H. Martin, Speech and Language Processing. An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, Second Edition, Pearson/Prentice Hall, 2009. 3rd edition draft: https://web.stanford.edu/~jurafsky/slp3/ 2. Kenneth R. Beesley, Lauri Karttunen, Finite State Morphology, CSLI Publications, 2003. 3. Rayesh Arumugam, Rajalingappa Shanmugamani, Hands-on Natural Language Processing with Python. A practical guide to applying deep learning architectures to your NLP applications, Packt, 2018. 4. Paul Deitel, Harvey Deitel,Python for Programmers: with Big Data and Artificial Intelligence Case Studies, Pearson Education, Inc, 2019. 5. Steven Bird, Ewan Klein, Edward Loper, Natural Language Processing with Python Analyzing Text with Natural Language Toolkit, OReilly Media, 2009. Updated version available at: http://www.nltk.org/book/.
	Supplementary literature	1. Alicja Nagórko, Podręczna gramatyka języka polskiego, Wydawnictwo Naukowe PWN, Warszawa, 2012. 2. Grammatical dictionary of Polish. Available at: sgjp.pl.
	eResources addresses	Uzupełniające Adresy na platformie eNauczanie: Przetwarzanie języka naturalnego -AITech-2024 - Moodle ID: 36656 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36656

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable