



Subject card

Subject name and code	Basics of deep learning, PG_00063889						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2028/2029		
Education level	first-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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Computer Architecture -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jan Cychnerski				
	Teachers		mgr inż. Karol Draszawka				
Lesson types	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	Introduction to theory and practice of deep learning.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment		Based on the analysis of the problem, the available training data, a student is able to select the appropriate architecture of a deep neural network and the training algorithm of this model to solve the problem. He/She can determine the quality of the prepared system.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[K6_U11] can plan and organise individual and team work		Student: - performs an individual assignment - takes part in a group assignment		[SU1] Assessment of task fulfilment		
Subject contents	Course content – lecture 1. Fundamentals of supervised machine learning 2. Fundamentals of artificial neural networks - basic models, layers, training algorithms 3. Convolutional neural networks 4. Recurrent neural networks 5. Transformer-like neural networks 6. Methods of regularization of neural networks 7. Practical tips for projects using deep neural networks						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Practical exercise		50.0%		50.0%		
	Midterm colloquium		50.0%		50.0%		

Recommended reading	Basic literature	Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016 Michael Nielsen, Neural Networks and Deep Learning
	Supplementary literature	Andrew Ng, Machine Learning Yearning Tutorials on deep learning frameworks (e.g. PyTorch, Keras)
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> Describe the architecture of convolutional neural networks, indicate their advantages over MLP networks and their typical applications. During the development of a project using deep model learning, the developer observed a low training error, but high validation error. What could be the reason for this? Consider several scenarios. Suggest ways to improve. 	
Practical activities within the subject	Not applicable	

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