SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

Deep Learning Methods

Educational subject description sheet

Basic information

Field of study
Course Offer for exchange students - second cycle studies, including uniform master studies (MA programmes)

Speciality
-

Organizational unit
Course Offer for exchange students

Study level
second cycle studies, including uniform master studies (MA programmes)

Study form
full-time studies

Education profile
General academic

Didactic cycle
2024/25

Subject code
PWMPWM2S_D.B100000S.02500.24

Lecture languages
english

Mandatory
Obligatory subjects

Block
Special subjects

Disciplines
Technical computing and telecommunications

Coordinator	Bartosz Świderski
Teacher	Bartosz Świderski

Period	**Examination**	**Number of ECTS points**
Winter semester	Exam **Activities and hours** Lecture: 15 Laboratory exercises: 30	4

Goals

Code	Goal
C1	Knowledge of the basics of deep learning

Entry requirements

Knowledge of mathematical analysis, probability, and mathematical statistics

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	artificial intelligence algorithms and issues related to their implementation ; optimization methods and decision support systems, modern trends in this field; methods, techniques and tools used to solve simple IT tasks in the field of problems related to computational complexity and artificial intelligence; information acquisition and knowledge discovery technology; mathematics (including: statistics, differential and difference equations, elements of functional analysis) in the field of creating models of neural networks and other typical activities in the field of computer science.		Oral exam, Project, Case
Skills – Student can:			
U1	describe the proposed model, extended by the formulation of own opinions and a critical selection of data and methods of analysis (is able to select the appropriate IT and statistical tools to analyze social and economic problems).		Oral exam, Project, Case
Social competences – Student is ready to:			
K1	providing information on the importance of artificial intelligence methods in the current state of technology.		Oral exam

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	To acquaint students with the topics: - Fully Connected Neural Networks - Convolution Neural Networks - Siamese Networks - Autoencoders - Recurrent Neural Network - Generative Adversarial Networks - Reinforcement learning Examples of implementations of deep model models	W1, U1, K1	Lecture, Laboratory exercises

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture, Problem lecture, Conversation lecture, Case study, Problem solving, Laboratory (experiment), learning by experiment
Laboratory exercises	Lecture, Case study, Problem solving, Individual work

Activities	Examination method	Percentage
Lecture	Project	20%
Lecture	Oral exam	20%
Lecture	Case	10%
Laboratory exercises	Project	20%
Laboratory exercises	Oral exam	20%
Laboratory exercises	Case	10%

Activities	Credit conditions
Lecture	the project, its defense, answers during classes
Laboratory exercises	the project, its defense, answers during classes

Literature

Obligatory

1. 1. Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press book, www.deeplearningbook.org 2. Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow, Concepts, Tools, and Techniques to Build Intelligent Systems, Geron Aurelien 3 . Deep Learning with TensorFlow and Keras, Amita Kapoor Antonio Gulli, Sujit Pal

Calculation of ECTS points

Activity form	Activity hours*
Lecture	15
Laboratory exercises	30
Preparing a report	16
Preparation for exercises	24
Self-study on the content covered in class	20
Conducting literature research	15
Student workload	**Hours** 120

Number of ECTS points	ECTS 4

* hour means 45 minutes