

COURSE DESCRIPTION CARD

Bialystok University of Technology Faculty of Engineering Management									
Field of study	Management							Degree level and programme type	first degree/ second degree
Specialisation/ diploma path	-							Study profile	-
Course name	Methods of artificial intelligence							Course code	IS-FM-00105S
								Course type	elective
Forms and number of hours of educational activities	L	C	LC	P	SW	FW	S	Semester	summer
					30			No. of ECTS credits	6
Entry requirements	-								
Course objectives	<p>The aim of the subject is to acquaint students with modern IT methods and tools used for modeling and improving business processes and for effective management. During the course, the student learns about the nature, evolution and typology of selected artificial intelligence methods, including primarily artificial neural networks and expert systems. The student also acquires the ability to use these tools to support business decisions. He can use and link this knowledge to the key aspects of innovative enterprise management. As part of the course, the student develops the ability to independently conduct analysis, select the appropriate tools taking into account the specific nature of the problem as well as to model the economic processes. The student also acquires skills to make advantage of this knowledge in practice, using among others: Sphinx Software (PC-Shell) and Statistca package (Neural Networks module).</p>								
Course content	<p>Knowledge: Artificial intelligence methods. Fundamentals of expert systems, types, functioning and structure of expert systems, representation of expert knowledge, methods of reasoning. Classification, construction and main tasks of artificial neural networks.</p> <p>Skills: Construction of expert systems supporting the decision-making process in enterprise management. Designing the expert systems using modern IT tools (PC - Shell). Examples of neural network applications for solving problems in economics and management. Selection of neural network architecture and testing their parameters. Choosing the learning method and the fundamentals of training process. Testing neural model in Statistica Automated Neural Networks.</p> <p>Social competences: Working in a team</p>								
Teaching methods	case studies, multimedia presentation, discussion								
Assessment method	written test, assessments of preparation for classes, evaluation of the final project								

Symbol of learning outcome	Learning outcomes	Reference to the learning outcomes for the field of study
	Knowledge: the graduate knows and understands	
LO1	modern IT tools in the field of artificial intelligence and know how to apply appropriate solutions to solve various types of management problems	-
	Skills: the graduate is able to	
LO2	apply artificial neural networks to forecast economic processes and phenomena and use them to solve regression and classification problems related to management (Statistica software)	-
LO3	to navigate the PC-Shell software and use this skill to design and build applications (expert systems) supporting business decisions and problem-solving	-
LO4	conduct the deduction, synthesis, analysis and interpretation of results and on this basis make appropriate operational and strategic decisions in the field of company management	-
	Social competence: the graduate is ready to	
LO5	work in a team	-
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	written test, assignments of preparation for classes	SW
LO2	written test, evaluation of the final project	SW
LO3	written test, evaluation of the final project	SW
LO4	evaluation of the final project, discussions, observations of working during classes	SW
LO5	observations of working during classes, evaluation of the final project	SW
Student workload (in hours)		No. of hours
Calculation	participation in specialization workshops	30
	preparation for specialization workshops	30
	participation in student-teacher sessions related to the specialization workshops	5
	preparation for written test	20
	study of the literature	25
	final project preparation	40
	TOTAL:	150
Quantitative indicators		HOURS
		No. of ECTS credits
Student workload – activities that require direct teacher participation		35
Student workload – practical activities		125
		1,4
		5

Basic references	<ol style="list-style-type: none"> 1. Surma J., Business Intelligence. Making Decisions Through Data Analytics, Business Expert Press, 2011. 2. Tuffery S., Data mining and statistics for decision making, Wiley, 2011. 3. Ünal, Muhammet ; Ak, Ayça ; Topuz, Vedat ; Erdal, Hasan, Artificial Neural Networks, Studies in Computational Intelligence, Optimization of PID Controllers Using Ant Colony and Genetic Algorithms, 2013, pp.5-17 	
Supplementary references	<ol style="list-style-type: none"> 1. Rutkowski L., Computational Intelligence: Methods and techniques, Springer, 2008. 2. Parkes, D. C., and M. P. Wellman. 2015. "Economic Reasoning and Artificial Intelligence." Science 349 (6245) (July 16): 267–272. doi:10.1126/science.aaa8403. http://dx.doi.org/10.1126/science.aaa8403. https://www.sciencedirect.com/journal/neural-networks/about/aims-and-scope 	
Organisational unit conducting the course	International Department of Logistics and Service Engineering	Date of issuing the programme
Author of the programme	Julia Siderska, PhD	17.02.2022

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar