

WSB University				
Field of study: Production Management and Engineering				
Course: Business Intelligence				
Educational profile: practical				
Education level: second-cycle studies				
Number of hours per semester	1		2	
	I	II	III	IV
Full-time studies (L/C/lab/pr/e)*				
Part-time studies (L/C/lab/pr/e)*			14 c	
LANGUAGE OF CONDUCTING CLASSES	Elements of English vocabulary, introduction of key terminology			
LECTURER				
FORM	classes			
COURSE OBJECTIVES	The aim is to familiarize students with and practise data analysis issues using appropriate tools. As part of classes, students in subgroups implement a project that is a practical application of data analysis tools to investigate/solve a specific business or research problem.			
Reference to learning outcomes		Description of learning outcomes	Method of verification of the learning outcomes	
Field-related learning outcome	PQF			
KNOWLEDGE				
The student				
ZIP2_W03 ZIP2_W05	P7S_WG	identifies and describes the environment of the selected data analysis package correctly	Electronic multiple-choice test Verification of the student's knowledge during the group task	
ZIP2_W03 ZIP2_W05	P7S_WG	demonstrates knowledge of the key concepts of data analysis, distinguishes and understands the concepts of data and information, knows the difference between data mining and machine learning	Electronic multiple-choice test Verification of the student's knowledge during the group task	
ZIP2_W03 ZIP2_W05	P7S_WG	demonstrates knowledge of data mining processes, understands and explains the objectives of each phase	Electronic multiple-choice test Verification of the student's knowledge during the group task	
ZIP2_W03 ZIP2_W05	P7S_WG	lists and describes the methods and objectives of the pre-processing of data, including data integration, cleaning and filtration	Electronic multiple-choice test Verification of the student's knowledge during the group task	
ZIP2_W03 ZIP2_W05	P7S_WG	demonstrates knowledge of data analysis techniques, including grading, grouping, association rules, generation and use of decision trees	Electronic multiple-choice test Verification of the student's knowledge during the group task	

SKILLS

The student			
ZIP2_U01 ZIP2_U03 ZIP2_U04	P7S_UW	chooses how to solve specific problems posed within the group task in the field of data analysis tools	A project and its presentation
ZIP2_U01 ZIP2_U03 ZIP2_U04	P7S_UW	solves practical design problems, proposes alternative solutions, uses and configures algorithms for the operation of a program	A project and its presentation
ZIP2_U11 ZIP2_U13	P7S_UK P7S_UO	discusses the software solutions used; in order to do so, he/she can use the available knowledge and cooperate with the team	A project and its presentation
SOCIAL COMPETENCES			
The student			
ZIP2_K01 ZIP2_K02 ZIP2_K03 ZIP2_K05	P7S_KK P7S_KO P7S_KR	Can perform tasks autonomously and responsibly, seek the necessary information in available sources of knowledge, including the Internet, communicate efficiently, maintain openness to arguments contrary to his or her ideas, engage in activities and implementation of the project, performs his or her work on time	implementation of the project, active participation in classes – presentation and discussion of progress in the implementation of the work, discussion on applied solutions and possible alternative solutions, search for solutions and their implementation
Student's own workload (1h teaching hour=45 minutes)**			
Full-time participation in lectures = participation in classes = preparation for classes = preparation for lectures/tutorial = preparation for an end-of-term test/examination = project tasks = e-learning = credit/examination = other = Total: ECTS points: Including practical classes:		Part-time participation in lectures = participation in classes = 14h preparation for classes = 14h preparation for lectures/tutorials = preparation for an end-of-term test//examination = 18h project tasks=25 e-learning = credit/examination = 2h other = 2h consultation Total:75h ECTS points: 3 Including practical classes: 3h	
PREREQUISITES	The student should have knowledge of mathematics and statistics and basic IT tools and techniques.		
COURSE CONTENT	Contact hours: MS Teams platform <ul style="list-style-type: none"> • Data and Information. Explanation of differences in basic concepts of data analysis. • Data mining and machine learning • Objectives and areas of application of data mining, definitions, facts and myths concerning the advantages and disadvantages of data mining • Definitions and descriptions of data mining processes (<i>KDD: Knowledge Discovery in Data, CRISP: Cross Industry Standard Process for Data Mining</i>) • Data mining techniques: overview of data mining algorithms: <ul style="list-style-type: none"> ○ classification algorithms, ○ grouping algorithms, ○ algorithms for constructing decision trees, ○ algorithms for discovering association rules, ○ algorithms for discovering sequence patterns, ○ other statistical algorithms (e.g. linear regression) • Machine learning techniques, differences between machine learning and data mining • Structural data descriptions (records based on rules: classifications and associations, decision- 		

	<p>making trees, abbreviated data sets after optimization and other)</p> <ul style="list-style-type: none"> • Methods of preparation of data sets for data mining, data cleaning, reducing the dimension of the input set, pre-processing of data. Methods for analyzing sets containing incomplete data. • Case study: sample data sets used for simple academic analyses • Case study: domain applications examples –real applications of data mining • Ethical issues related to data mining: data anonymity, legality of the scope of data analysis <p>End-of-term assignment:</p> <ul style="list-style-type: none"> • Analysis of data using data analysis tools based on the selected recognized data mining package
COMPULSORY LITERATURE	<ol style="list-style-type: none"> 1. Making sense of data I : a practical guide to exploratory data analysis and data mining / Glenn J. Myatt, Wayne P. Johnson. - John Wiley & Sons, Inc., cop. 2014
OPTIONAL LITERATURE	<ol style="list-style-type: none"> 1. Waikato Environment for Knowledge Analysis: http://www.cs.waikato.ac.nz/ml/weka/documentation.html 2. J. Hand, H. Mannila, P. Smyth, Principles of Data Mining, MIT Press, 2001 3. Available sources of knowledge on the Internet (technical documents, Internet fora, electronic books, etc. — links from the teacher) 4. Business Intelligence. J. Surma . – PWN, 2021.
TEACHING METHODS	<p>Contact hours: Multimedia presentations, case studies, discussions, tasks in subgroups.</p>
TEACHING AIDS	<p>multimedia presentations, sample programs and tutorials, discussion, documentation available on the Internet</p>
PROJECT (if implemented in the framework of a classes module)	
FORM AND CONDITIONS OF ASSESSMENT	<p>Implementation of the group task, passing a test in the electronic form</p> <p>Written assignment</p> <p>Objective: Using knowledge of data analysis methods and tools in practice to solve a specific business or research problem.</p> <p>Scope:</p> <ul style="list-style-type: none"> • identification and selection of data analysis tools • (actual) data analysis • evaluation and interpretation of data analysis results <p>project documentation including final conclusions</p> <p>The work is verified by the teacher in terms of the correctness and quality of implementation of the various stages. The results of the evaluation and interpretation of the analysis results will also be assessed. The final grade is influenced by the student's active work during the course.</p>

* L-lecture, C- classes lab- laboratory, pr- project, e- e-learning