



Subject card

Subject name and code	Business Data Semantics and Representation, PG_00053100						
Field of study	Data Engineering						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
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			English		
Semester of study	6	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Informatics In Management -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Sławomir Ostrowski					
	Teachers	dr inż. Sławomir Ostrowski mgr Jaromir Durkiewicz					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60	8.0		57.0		125
Subject objectives	The aim of the course is to present the possibilities of applying web intelligence methods in business.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] identifies veracious sources of information relevant to the analyzed issues	The student knows and understands the methods of obtaining and assessing the reliability of data used to build ontologies and knowledge bases in business analyses, in particular data from industry reports, databases, and online resources.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U07] uses information technologies to improve the acquisition, analysis and processing of data in business applications	The student is able to use Semantic Web technologies (e.g., RDF, OWL) and ontology engineering tools to model knowledge and integrate business data from various sources.			[SU4] Assessment of ability to use methods and tools		
	[K6_K02] makes competent and ethical decisions to create and maintain economic, social and environmental values	The student is prepared to make responsible decisions regarding the use of data and knowledge in business analysis, particularly in the context of data reliability, source transparency, and ethical use of information.			[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills		

Subject contents	Course content – lecture Idea of the Semantic Web
	Monitoring of the Internet, brand protection
	NLP as a knowledge discovery method of the Semantic Web, sentiment analysis
	Social networks analysis
	Introduction to ontologies
	Resource Description Framework (RDF)
	Web Ontology Language (OWL)
	Semantic Web Rule Language (SWRL) as an extension of OWL
	Description Logic (DL) and inference algorithms
	Knowledge bases vs. databases
	Elements of ontology engineering
	Application of semantic technologies in business
	Course content – laboratory
	1. Introduction to laboratories and project work organization.
	2. Identification and analysis of a selected business sector as a domain for knowledge modeling.
	3. Acquisition and analysis of business knowledge sources (industry reports, market data, literature).
	4. Introduction to knowledge modeling and ontology in a business context.
	5. Designing ontologies for a selected area of economic activity.
	6. Building ontologies using the Protégé tool.
	7. Defining classes, relationships, and properties of ontologies for business knowledge representation.
	8. Creating ontology instances and building a knowledge base for the analyzed industry.
	9. Integrating data and documenting knowledge sources used in the project.
	10. Developing a knowledge base and using it to support managerial decisions.
	11. Designing simple applications or scenarios using the developed knowledge base.
	12. Presentation and discussion of project results ontology and knowledge base (R1 report).
	13. Developing an application to support the activities of a company in the analyzed industry.

	14. Presentation and evaluation of final team projects (R2 report).		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	60.0%	50.0%
	Reports	60.0%	50.0%
Recommended reading	Basic literature	Hitzler, P., Krötzsch, M., Rudolph, S. (2020). Foundations of Semantic Web Technologies (2nd ed.). CRC Press.	
		Allemang, D., Hendler, J. (2020). Semantic Web for the Working Ontologist (3rd ed.). Morgan Kaufmann.	
		Hogan, A. et al. (2021). Knowledge Graphs. Morgan & Claypool.	
	Supplementary literature	Antoniou, G., van Harmelen, F. (2008). A Semantic Web Primer. MIT Press.	
		Hitzler, P., Krötzsch, M., Rudolph, S. (2010). Foundations of Semantic Web Technologies. CRC Press.	
		Allemang, D., Hendler, J. (2011). Semantic Web for the Working Ontologist. Morgan Kaufmann.	
		Baader, F. (2003) The description logic handbook: theory, implementation, and applications, Cambridge University Press	
		Goczyła, K. (2011) Ontologie W Systemach Informatycznych, Exit	
		Mykowiecka, A (2007) Inżynieria Lingwistyczna, PJWSTK	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Application of sentiment monitoring tools fondness in brand protection		
	Detection of trends in social networks		
	Semantic data integration		
Practical activities within the subject	Not applicable		

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