GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Business Data Semantics and Representation, PG_00053100		
Field of study	Data Engineering, Data Engineering		
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	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	mgr Jaromir Durkiewicz dr inż. Sławomir Ostrowski	

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_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.	[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice
[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

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
Reports	60.0%	50.0%
Exam	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. 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 activites within the subject	Not applicable

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