

RTU Course "Advanced Analytics and Knowledge Technologies"**33000 Faculty of Computer Science, Information Technology and Energy****General data**

Code	DE0749
Course title	Advanced Analytics and Knowledge Technologies
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Ilze Birzniece
Academic staff	Mārīte Kirikova Māra Romanovska
Volume of the course: parts and credits points	1 part, 6.0 credits
Language of instruction	EN
Annotation	Advanced analytics and knowledge technologies nowadays play a key role in dealing with varied forms of information, structured and unstructured, at the intersection of people, processes and technology in order to create value for the organization. In the study course, students will learn about knowledge management in enterprises and understand the challenges related to processing different data types. The study course will provide insight into appropriate analytical methods and tools to be deployed to create, extract, maintain, renew and propagate business knowledge in order to capitalise from the information assets.
Goals and objectives of the course in terms of competences and skills	The goal of the study course is to provide the knowledge of capabilities from data analytics and knowledge management in enterprises as well as skills to extract the knowledge from data. The objectives of the study course are: 1. to develop competencies for identifying, extracting, and managing data and knowledge within organizations; 2. to acquaint with analytics for different kinds of data and tasks; 3. to provide skills in selecting and applying methods of advanced analytics and other knowledge technologies; 4. to improve an understanding of the role of these technologies in organizational knowledge management.
Structure and tasks of independent studies	Individual and group assignments for learning high-level analytics, knowledge technologies and knowledge management methods and tools.
Recommended literature	Obligātā/Obligatory: 1. Fundamentals of Business Intelligence, Wilfried Grossmann, Stefanie Rinderle-Ma, 2015. 2. Data Mining, 4th Ed., Ian H. Witten, Eibe Frank, Mark A. Hall, Christopher Pal, 2016 (3rd Ed. 2011). Papildu/Additional: 1. Business Analytics: Data Analysis and Decision Making, 7th Ed., S. Christian Albright, Wayne L. Winston, 2020. 2. Social network analysis, 3rd Ed., John Scott. Los Angeles, SAGE, 2013. 3. Business process modeling, simulation and design, 3rd Ed., Johan Marklund. Boca Raton : CRC Press, Taylor & Francis Group, 2019. 4. Data Mining and Machine Learning: Fundamental Concepts and Algorithms, 2nd Ed., Mohammed J. Zaki and Wagner Meira, Jr, 2020 (online book: https://dataminingbook.info/book_html/). 5. Data Mining for Business Analytics: Concepts, Techniques and Applications in Python, Galit Shmueli, Peter C. Bruce, Peter Gedeck, Nitin R. Patel, 2019.
Course prerequisites	Knowledge in databases and basics of artificial intelligence.

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Nature of human and artificial knowledge, traditional approaches to knowledge management, business intelligence. Integrating classical knowledge management and advanced knowledge technologies.	10	10	0	0
From data to knowledge: data provisioning, representation and reporting. Open data.	10	10	0	0
Data mining approaches: regression, classification, clustering, association rules mining. Data preprocessing. Credibility.	12	12	0	0
Analytical and data mining tools, their practical application in data analysis.	12	24	0	0
Advanced analytics in various applications: structured and unstructured data usage in temporal, business process, social network etc. analytics. Emotional intelligence in knowledge management.	12	24	0	0
Demonstration of learning outcomes through presentations and examination.	8	16	0	0
Total:	64	96	0	0

Learning outcomes and assessment

Learning outcomes	Assessment methods
Understands the role of knowledge management in enterprises.	Individual assignment ((students' presentations on the most important factors of knowledge management).
Understands commonalities and differences in human and artificial knowledge.	Individual assignment (students' presentations on the most important common and different features of natural and artificial knowledge).
Is able to describe the main analytical approaches and recommend appropriate solutions, linking the possibilities and needs of the problem area with the available analytical solutions.	Practical works, project (group assignment), examination.
Is able to apply data mining and knowledge representation tools and select methods that allow supporting data properties and business needs.	Practical works, project (group assignment), examination.
Understands the challenges and opportunities of Big Data, Linked and Open Data.	Examination.
Is able to integrate classical knowledge management methods and advanced knowledge technologies.	Individual assignment (homework).
Orients in technologies of advanced analytics and their capabilities in varied applications.	Individual assignment (students' presentation), examination.
Is able to perform different tasks according to the principles of academic integrity and ethics in research and business.	Individual assignments, practical works, project (group assignment), examination.

Evaluation criteria of study results

Criterion	%
Individual assignments (presentations, homework)	15
Practical works	25
Project	30
Examination	30
Total:	100

Study subject structure

Part	CP	Hours			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	6.0	32.0	32.0	0.0		*	