RTU Course "Business Analytics with Machine Learning"

33000 Datorzinātnes, informācijas tehnoloģijas un enerģētikas fakultāte

General data

Code	DE0940
Course title	Business Analytics with Machine Learning
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Ilze Birzniece
Volume of the course: parts and credits points	1 part6.0 ECTS credits
Language of instruction	LV, EN
Abstract	The volume of data worldwide is growing daily, and potential business value hides in data. Looking for new business opportunities in data today is an essential part of the growth of business in any sector. The knowledge provided in this study course complements previous study experience to shape an integrated view of business analytics as a field of data science. The needs of business analytics are addressed through a perspective of machine learning project lifecycle, providing hands-on experience in the opportunities and challenges of data analytics.
Goals and objectives of the course in terms of competences and skills	The goal of the study course is to create a comprehension of data science and skills to develop data-based solutions for particular business needs. The objectives of the study course: - to introduce the needs and opportunities of business analytics; - to raise awareness of data science building blocks and machine learning project lifecycle; - to develop experience in data extraction and processing to acquire data-based knowledge; - to develop skills to select and apply machine learning methods as well as analyse their results; - to promote analytical capabilities, domain ethics and academic writing skills.
Structure and tasks of independent studies	Through independent studies, students perform both individual and group works to learn the main study course subjects, drill the practical skills and explore in depth individual subjects. These activities are done in accordance with the principles of academic integrity. Independent studies include homework – analysis of the relevant literature, capstone project development, as well as preparing to demonstrate achieved results in presentations and examination.
Recommended literature	Obligātā / Obligatory: 1. Business analytics: combining data, analysis & judgement to inform decisions, Mary Ellen Gordon. London: SAGE Publications Ltd, 2023. 2. Thompson, Simon. Managing Machine Learning Projects: from design to deployment, Manning, 2023. Papildu / Additional: 1. 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/). 2. Data Mining for Business Analytics: Concepts, Techniques and Applications in Python, Galit Shmueli, Peter C. Bruce, Peter Gedeck, Nitin R. Patel, 2019. 3. Business Analytics: Data Analysis and Decision Making, 7th Ed., S. Christian Albright, Wayne L. Winston, 2020. 4. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python 2nd Edition, Peter Bruce, Andrew Bruce, Peter Gedeck. O'Reilly Media, 2020.
Course prerequisites	Basic knowledge of supervised machine learning methods, Python programming language, data base technologies.

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Data analytics: business needs analysis, data exploratory analysis, data representation.	8	8	0	0
Data preparation: data acquisition, statistical analysis, preprocessing.	12	16	0	0
Machine learning. Unsupervised machine learning: clustering, association rules mining, dimensionality reduction. Recap on supervised learning methods. Big data.	12	18	0	0
Machine learning project life cycle: theory and practice.	8	20	0	0
The credibility of machine learning results, interpretation, ethics of data science.	8	8	0	0
No-code tools and code libraries for data analysis, visualization and machine learning applications.	8	10	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	Learning outcomes assessment methods and assessment criteria
Knows characterize data preparation tasks and conduct data preliminary analysis, transformations, visualization.	Fulfilled practical works, project, homework,examination. The student demonstrates an understanding of data preprocessing tasks and skills to fulfill them with appropriate means.

Is able to discriminate machine learning approaches, select and apply appropriate methods for particular data.	Fulfilled practical works, project, homework,examination. The student demonstrates an understanding of the nature of machine learning methods, common and distinct aspects of them, as well as ability to develop software appropriate to the problem being solved.
Is able to interpret results of analysis and derive data-driven business decisions.	Fulfilled practical works, project, homework,examination. The student demonstrates competence in the interpretation of the obtained results.
Using knowledge in data analysis and ability to apply appropriate tools, is able to create solutions for business necessities.	Fulfilled practical works, project, homework,examination. The student demonstrates an understanding of the business analytics life cycle, as well as the ability to develop a task-oriented software solution set.
Is able to perform different tasks according to the principles of professional and academic integrity.	Fulfilled practical works, project, homework,examination. The student demonstrates competence to accomplish individual and group tasks in accordance to professional and academic ethics.

Course tests

Tests	% of final assessment
Homework	20
Practical woks	15
Project	35
Examination	30
Total:	100

Course planning

Part	Semester			CP	Academic hours			Tests		
	Autumn	Spring	Summer		Lectures	Practical	Lab.	Test	Exam	Work
1.		*		6.0	32.0	32.0	0.0		*	