## RĪGAS TEHNISKĀ UNIVERSITĀTE

### RTU Course "Business Analytics"

12309 Mākslīgā intelekta un sistēmu inženierijas katedra

### General data

| | |
|---|---|
| Code | DPI721 |
| Course title | Business Analytics |
| Course status in the programme | Compulsory/Courses of Limited Choice |
| Responsible instructor | Ilze Birzniece |
| Volume of the course: parts and credits points | 1 part, 4.0 Credit Points, 6.0 ECTS credits |
| Language of instruction | LV, EN |
| Abstract | The volume of data worldwide is growing daily and potential business value lay in the data. Looking for new business opportunities in data today is an essential part of the growth of business in any sector. Knowledge discovery from data is a helical process that includes data retrieval, data pre-processing, selection and application of appropriate analytical methods, and interpretation of results. Data mining is the use of statistical and machine-learning techniques on historical data aiming to obtain an explanation or prediction. The course deals with key data mining approaches from supervised and unsupervised learning – regression, classification, clustering and association rules mining - by introducing the most popular methods in each of them. The need and opportunities for analytics arise in variaty of tasks., e,g, sensor data processing, social network analysis, customer relationship etc. Text mining and dealing with unstructured and semi-structured data is one of the topical classification targets. The course focuses on compreheanson and practice, using freeware tool Weka (additionally - Python language for experienced users) to analyse real data sets and interpret the insights. Students work in teams and apply their knowledge and skills in data analysis to develop a capstone project. |
| Goals and objectives of the course in terms of competences and skills | The goal of the course is to provide knowledge of data analytics capabilities and skills to select and apply appropriate approaches to particular business data needs.<br><br>The objectives of the course:<br>1. Introduce the needs and opportunities of business analytics.<br>2. Raise awareness of data extraction and processing to acquire data-driven knowledge.<br>3. Provide knowledge and skills to work with data mining techniques and tools.<br>4. Promote analytical capabilities, critical thinking and academic writing skills. |
| Structure and tasks of independent studies | Through independent studies, students perform both individual and group works to learn the main course subjects, drill the practical skills and explore in depth individual subjects. These activities are done in accordance to the principles of academic integrity. Independent studies include home works – analysis of the relevant literature, essays, capstone project development, as well as preparing to demonstrate achieved results in presentations and examination. |
| Recommended literature | Obligātā / Mandatory:<br>1.Data Mining, 4th Ed., Ian H. Witten, Eibe Frank, Mark A. Hall, Christopher Pal, 2016 (3rd Ed. 2011)<br>2.Fundamentals of Business Intelligence, Wilfried Grossmann, Stefanie Rinderle-Ma, 2015<br><br>Papildu / Additional:<br>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/<br>2.Data Mining for Business Analytics: Concepts, Techniques and Applications in Python, Galit Shmueli, Peter C. Bruce, Peter Gedeck, Nitin R. Patel, 2019<br>3.Business Analytics: Data Analysis and Decision Making, 7th Ed., S. Christian Albright, Wayne L. Winston, 2020 |
| Course prerequisites | Basic knowledge about data storage and processing. |
| Courses acquired before | |

### Course contents

| Content | Full- and part-time intramural studies | | Part time extramural studies | |
|---|---|---|---|---|
| | Contact Hours | Indep. work | Contact Hours | Indep. work |
| Business intellingece, metrics, key performance indicators, dashboards for managerial decision making | 12 | 14 | 0 | 0 |
| Data analytics: business needs analysis, data exploratory analysis, preprocessing, statistics, data representation | 16 | 20 | 0 | 0 |
| Data mining: regression, classification, clustering, asociation rules. Credibiltiy. State-of-the-art data mining applications | 14 | 18 | 0 | 0 |
| Data mining tools, their practical application in data analysis | 14 | 28 | 0 | 0 |
| Demonstration of learning outcomes through presentations and examination | 8 | 16 | 0 | 0 |

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|---|---|---|---|---|
| Total: | 64 | 96 | 0 | 0 |

### Learning outcomes and assessment

| Learning outcomes | Assessment methods |
|---|---|
| Characterize data pre-processing tasks and conduct data transformations | Project, examination |
| Discriminate data mining approaches, select and apply appropriate methods for particular data | Practical works, project, examination |
| Analyze business needs and link them to capabilities data analytics | Home works, project, examination |
| Derive data-driven business decisions | Home work, project, examination, practical works |
| Apply at least one data mining tool | Practical works, project |
| Perform different tasks according the principles of academic integrity | Home works, group work, project, examination, practical works |

### Evaluation criteria of study results

| Criterion | % |
|---|---|
| Home works | 15 |
| Practical woks (labs) | 25 |
| Group project | 30 |
| Examination | 30 |
| Total: | 100 |

### Course planning

| Part | Semester | | | CP | ECTS | Hours per Week | | | Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Autumn | Spring | Summer | | | Lectures | Practical | Lab. | Test | Exam | Work |
| 1. | * | | | 4.0 | 6.0 | 2.0 | 2.0 | 0.0 | | * | |