



Syllabus

Term: 2025/26/2 **Subject name:** Business Intelligence **Subject code:** M23KOA02E

Unit (Unit code) Department of Management Science (KMI)

Lecturer responsible for the course: Dr. KRUZSLICZ Ferenc

Requirement: Exam

Classes per week : 4/0/0

Classes per term:

Purpose of education:

Description and aims

This course provides an introduction to the concepts of decision support information systems focusing on components and functionality of business intelligence (BI). It explores how business problems can be solved effectively by using operational data to create and use data warehouses, and then applying data mining tools and analytics combined with machine learning (ML) to gain new insights into organizational operations. Detailed discussion of the analysis, design and implementation of systems for BI, including the different types of visual and automatic reporting and analytics. Wide range of BI related real world business problems and approaches are investigated in order to introduce their standard solution schema. Also methods and techniques are demonstrated how the effectiveness of such various solutions can be measured. The major topics covered like enterprise data warehousing, big data and data/text mining helps to understand the new challenges in data, information and knowledge management. Theoretical knowledge is applied and tested in practice using BI software tools and modeling. Case studies are used to explore the use of the CRISP-DM approach, the success and limitations of BI application, as well as their technical, social and ethical issues.

Contents:

Content, schedule

1. Introduction: BI and Big Data
(*RA: Textbook chapter 1 & Workbook chapter 13*)
2. Data Warehouses, OLAP operations, KPIs, Balanced Scorecards
(*RA: Textbook chapter 3 & Workbook chapter 1*)
3. Data Exploration and Visualization
(*RA: Textbook chapter 2 & Workbook chapter 2*)
4. Data Preprocessing and Cleansing, CRISP-DM
(*RA: Textbook chapter 4 & Workbook chapter 3*)
5. Data Analytics, Data Mining Techniques, Lazy and Eager Methods



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- (RA: Workbook chapter 4.1, 4.4)
- 6. Classification Evaluation, Validation, Performance Metrics
(RA: Workbook chapter 8, 4.2)
- 7. Statistical and Machine Learning, Naive Bayes and Artificial Neural Networks
(RA: Workbook chapter 4.5, 4.6)
- 8. Association analysis
(RA: Workbook chapter 6)
- 9. Segmentation methods, Big Data
(RA: Textbook chapter 7 & Workbook chapter 7)
- 10. Text Mining, Web Mining, Sentiment Analysis
(RA: Textbook chapter 5 & Workbook chapter 9)
- 11. Optimization and Simulation
(RA: Textbook chapter 6 & Workbook chapter 5)
- 12. Privacy and Managerial Considerations
(RA: Textbook chapter 8)

Learning and teaching strategy, methodology

Principal teaching methodologies: Lectures and Case studies

Theoretical foundations strictly follow the text book. Reading assessments are short quizzes used for measuring the preparation level. Presentations and other supplementary course materials are provided. (CILOs 1,2,7,8) In class the selected topic is discussed and small scale illustrative examples and exercises are solved. (CILOs 3,4,5) The corresponding computer lab exercises are simulated data mining projects of different fields and real data sets. Students have to read the case study and do the basic data exploratory steps in advance, and group work is allowed. (CILOs 5,6,7) Along with the course progresses less detailed instructions are given and the data analytic goals are getting more ambiguous. Midterm exams based on similar exam cases, where students have to understand and build a working model on computer, evaluate it, and interpret the results. (CILOs 4,5,8)

System of examing and valuation:

Assessment

Formative assessment elements:

Learning progression is measured and visualized with a "robo-dog" gamification tool. Correct answers of RAs are revealed after evaluation referring to the appropriate chapter of the core materials. Complete clues are given for weekly group works how the problems was modeled, but with the final exact solution, which must be



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System of examing and valuation:

reproduced. Students are involved in course and faculty level competitions, where the results can be compared to the others in ranking lists.

Summative assessment elements:

Individual Assessment 100% **Group Assessment** 0%

Name of the element	Weight	Type	Details	Retake opportunity	Req.*	Related CILOs
Reading assessment	20%	individual written	weekly quizzes	no	no	1,2,7
Midterm exam	40%	individual written	computer exercise	yes	yes	3,4,6
Final exam	40%	individual written	essay questions	yes	yes	1,2,5,7,8
<i>Home work bonus</i>	<i>(5%)</i>	<i>optional group work</i>	<i>computer task</i>	<i>no</i>	<i>no</i>	<i>4,5,6</i>
<i>Competition bonus</i>	<i>(5%)</i>	<i>optional individual</i>	<i>modeling tasks</i>	<i>no</i>	<i>no</i>	<i>3,4,5,6</i>

* Req.: Completion of the element is required to pass the course, irrespective of the performance in other elements.

Bibliography:

Learning materials



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Bibliography:

- Essential
 - Ramesh Sharda, Dursun Delen, Efraim Turban: Business Intelligence, Analytics, and Data Science: A Managerial Perspective, Pearson 2017, (4th Global Edition) ISBN: 978-1292220543, pp.512.
 - Bala Deshpande, Vijay Kotu: Predictive Analytics and Data Mining (Concepts and Practice with RapidMiner) Morgan Kaufmann Publishing 2014, (1st Edition) ISBN: 978-0128014608, pp. 446

Bibliography:

- Recommended
 - Afolabi Ibukun Tolulope: Data Science and Analytics for SMEs - Consulting, Tools, Practical Use Cases, Springer, 2022 ISBN: 1484286693, pp. 356
 - Markus Hofmann, Ralf Klinkenberg: RapidMiner: Data Mining Use Cases and Business Analytics Applications, Chapman & Hall/CRC, 2013 ISBN: 1482205491, pp. 525
 - Anil Maheshwari: Business Intelligence and Data Mining (Big Data and Business Analytics) Business Expert Press 2014, (1st Edition) ISBN: 978-1631571206, pp. 180