



UNIVERSITY "UKSHIN HOTI" PRIZREN
International Summer School (ISS) 2023
Faculty of Computer Science

SYLLABUS				
Academic unit / faculty:	Faculty of Computer Science		ISS edition:	2023
Course title:	Data Mining for Business Intelligence: A Coding and Non-Coding Perspective			
Course status:	Obligatory	Code :	ECTS credits:	4
Teaching days/weeks:	14 days / 2 weeks	Teaching hours:	Lectures:	Exercises:
			3	1
Office hours:	Daily (Monday-Friday, 2 Weeks)			
Course professor 1. / Supervisor:	Zenun Kastrati	E-mail:	zenun.kastrati@lnu.se	
		Tel.:	+46 700 97 87 32	
Course co-professor 2. / Co-supervisor:	Endrit Fetahu	E-mail:	+383 45 819 915	
		Tel.:	endrit.fetahu@uni-prizren.com	
COURSE CONTENT:				
<p>The course aims to provide the students an understanding of the fundamental principles, concepts, and techniques of data mining and business intelligence from both coding and non-coding perspectives. Students will learn about data preparation and pre-processing, as well as various data mining techniques such as classification, clustering, and association rule mining. They will also be introduced to predictive modeling and evaluation, text mining and sentiment analysis, and non-coding tools for data mining and business intelligence. Through real-world cases and hands-on exercises, students will develop practical skills and knowledge that can be applied to solving real-world business problems. By the end of the course, students will have a solid foundation in data mining and business intelligence and will be equipped with the tools and techniques needed to analyse and extract insights from large and complex data sets.</p>				

Course objectives:		Course learning outcomes:	
<ul style="list-style-type: none"> ▪ Introduce students to the fundamental principles and concepts of data mining and business intelligence. ▪ Equip students with practical skills to analyse and extract insights from large and complex data sets. ▪ Provide an understanding of the different data mining techniques and their applications. ▪ Identify emerging trends in data mining and business intelligence research and understand their potential implications for the future. ▪ Develop student's ability to create predictive models and evaluate their accuracy using appropriate metrics. 		<ul style="list-style-type: none"> ▪ Understand the basic principles and concepts of data mining and business intelligence. ▪ Identify and apply appropriate data preparation and pre-processing techniques to handle large and complex data sets. ▪ Analyse and interpret data using various data mining techniques such as classification, clustering, and association rule mining. ▪ Develop predictive models and evaluate their accuracy using appropriate metrics. ▪ Apply text mining and sentiment analysis techniques to analyse unstructured data. 	
TEACHING METHODS:			
Lectures, hands-on exercises, discussions, course projects, homework, office hours (consultations) etc.			
CONDITIONS FOR COURSE IMPLEMENTATION:			
Classroom equipped with computer, projector and other IT devices.			
STUDENT EVALUATION METHODS AND GRADING SCALE:			
<p>The course is subject to continuous evaluation. At regular intervals we also ask students to participate in a more comprehensive evaluation. Student evaluation is done by exam, and the final grade consists of the following components:</p> <ul style="list-style-type: none"> ▪ Course project: 40%, ▪ Final exam: 60%, 	GRADING SCALE		
	Evaluation in %	Final grade	
	91 – 100	10	(ECTS – A)
	81 – 90	9	(ECTS - B)
	71 – 80	8	(ECTS - C)
	61 – 70	7	(ETCS - D)
	51 – 60	6	(ETCS - E)
0 – 50	5*	(ETCS – FX)	
LANGUAGE OF EXAMINATION:			
The examination tests are provided in English language, and students submit response in English.			
STUDENT DUTIES AND OBLIGATIONS:			
Lectures		Exercises and other study activities	
<ul style="list-style-type: none"> ▪ Regular and active lecture attendance ▪ Active participation in discussions ▪ Respect of the University Code of Ethics etc. 		<ul style="list-style-type: none"> ▪ Regular attendance of exercises and study activities ▪ Respect of the University Code of Ethics etc. 	

STUDENT WORKLOAD:			
Activity	Hours	Days	Total hours
Lectures	3	10	30
Exercises	1	10	10
Field work visits	0	0	0
Reading (Own study time)	3	10	30
Assignments (project, presentation, homework)	2	5	10
Exam preparation	1.5	10	15
Exam assessment	2	3	6
Total student workload:			101
Note: 1 ECTS credit = 25 hours, for example if the course has 4 ECTS credits a student must have workload of at least 100 hours during the International Summer School (ISS).			

DAY	LECTURES		EXERCISES	
	Topic	Hours	Topic	Hours
1.	Introduction to Data Mining and Business Intelligence <ul style="list-style-type: none"> - Overview of the course and its objectives - Introduction to data mining and business intelligence - Importance of data mining and business intelligence in decision-making - Ethical considerations in data mining and business intelligence 	3	Exercises for topic 1	1
2.	Data Preparation and Data Pre-processing <ul style="list-style-type: none"> - Data cleaning and data integration - Data reduction and data transformation - Handling missing values and noisy data - Introduction to data visualization 	3	Exercises for topic 2	1
3.	Data Mining Techniques for Classification <ul style="list-style-type: none"> - Introduction to classification techniques - Decision trees and random forests 	3	Exercises for topic 3	1

	<ul style="list-style-type: none"> - Naive Bayes classifiers - Support vector machines 			
4.	Data Mining Techniques for Clustering <ul style="list-style-type: none"> - Introduction to clustering techniques - K-means clustering - Hierarchical clustering - Density-based clustering 	3	Exercises for topic 4	1
5.	Data Mining Techniques for Association Rule Mining <ul style="list-style-type: none"> - Introduction to association rule mining - Apriori algorithm - Evaluation metrics for association rule mining 	3	Exercises for topic 5	1
6.	Predictive Modeling and Evaluation <ul style="list-style-type: none"> - Introduction to predictive modeling - Linear regression and logistic regression - Model evaluation metrics - Overfitting and underfitting 	3	Exercises for topic 6	1
7.	Text Mining <ul style="list-style-type: none"> - Introduction to text mining - Text preprocessing and feature extraction 	3	Exercises for topic 7	1
8.	Sentiment Analysis <ul style="list-style-type: none"> - Sentiment analysis techniques - Applications of text mining and sentiment analysis 	3	Exercises for topic 8	1
9.	Non-Coding Approaches to Data Mining and Business Intelligence <ul style="list-style-type: none"> - Introduction to non-coding tools for data mining and business intelligence - Overview of existing BI tools and their capabilities - Interactive visualization tools - Dashboarding and reporting tools 	3	Exercises for topic 9	1
10.	Emerging Trends and Future Directions <ul style="list-style-type: none"> - Emerging trends in data mining and business intelligence - Case studies and real-world applications - Future directions in data mining and business intelligence research - Recap of the course and closing remarks 	3	Exercises for topic 10	1

LITERATURE:

Books:

- Shmueli, G., Bruce, P. C., Yahav, I., Patel, N. R., & Lichtendahl Jr, K. C. (2017). *Data mining for business analytics: concepts, techniques, and applications in R*. John Wiley & Sons.
- Provost, F., & Fawcett, T. (2013). *Data Science for Business: What you need to know about data mining and data-analytic thinking*. " O'Reilly Media, Inc."

Additional:

- Kumar, U. D. (2017). *Business analytics: The science of data-driven decision making*. Wiley.

REMARKS FOR STUDENTS:

- Student should be aware of and respect the institution and Code of ethics.
- Student should respect the schedule of lectures, exercises and other study activities.
- Student should possess and show student ISS ID card during exam.
- Student course project/presentation/homework must comply with professor instructions.
- During the exam is strictly forbidden to use of mobile phone devices.