NAME OF THE COURSE	Business Intelligence					
Code	EUB311	Year of study	1 (graduate)			
Course teacher	Full professor Nikša Alfirević, PhD Full professor Mario Jadrić, PhD	Credits (ECTS)	5 ECTS			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			26		26	
Status of the course	Compulsory/Elective	Percentage of application of e-learning	40%			

COURSE DESCRIPTION

Course objectives	Objective of the course is to introduce the theoretical foundations and the selected practical tools for data warehousing and analysis, as directed toward managerial decision-making.
Course enrolment requirements and entry competences required for the course	Elementary practical knowledge, related to the usage of a personal computer, a Web browser and office productivity (Word, Excel, Powerpoint).
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Learning Outcomes (LOs): 1. Evaluate forms, importance and application of information in theory and practice of contemporary business 2. Assess the concept, sources and the role of business information and the multidisciplinary definitions of business and competitive intelligence 3. Recommend a relevant process and methods of business intelligence, with the application of the CRISP methodology 4. Appraise the concept, objectives and processes of Web analytics, with the application of relevant Web analytics metrics (Key Performance Indicators – KPIs, benchmarks and Web analytics outcomes)

Course content broken down in detail by weekly class schedule (syllabus)

Week	Lectures		Exercises:	
	Topic	Hours	Topic	Hours
1	*Introduction to Business Intelligence (BI).* Forms, importance and application of information in theory and practice of contemporary business.	2	Introductory discussion. Context and the concept of Business Intelligence (BI). Methodologies and hierarchical levels of BI. Data mining and Knowledge Discovery in Databases. Data mining vs. OLAP.	2
2	*Information science and the information science concepts.* Information and communication science and/vs. BI. Intelligence activities.	2	*Multi-dimensional data analysis in MS Excel.*	2
3	*Business information, BI and Competitive Intelligence (CI).* The concept, sources and the role of business information. Multidisciplinary definition of BI and CI.	2	Data quality. Pre-processing data. Extraction, transformation and loading of data (ETL processes). Data mining processes, according to CRISP and SEMMA methodologies. An ETL example. Data sources.	2

	4	*Business information systems (IS) in BI.* Definition and characteristics of an IS in BI. Tehnological foundations of BI. Data warehouses and data warehousing (DW).	2	Model-building in Rapid Miner. Preparing data. Correlations and data association.	2
	5	*Architecture and building a DW system.* Fundamental forms of DW system architecture. ETL processes.	2	Model-building in Rapid Miner. Association rules.	2
	6	*Enterprise Information Architecture and data integration.* DW vs. Data Lake.	2	Model-building in Rapid Miner. K-means clustering.	2
	7	*User applications (front-end) in BI.* Reporting and search tools. OLAP.	2	Model-building in Rapid Miner. Text mining.	2
	8	***Evaluation 1***	2		2
	9	*User applications in BI (continued).* Indicator dashboards and scorecards. Analytic applications.	2	Model-building in Rapid Miner. Linear regression.	2
	10	*Spontaneous/unmanaged BI systems* (Data Shadow systems).	2	Model-building in Rapid Miner. Logistic regression.	2
	11	*Managerial and organizational aspects of BI.* Teams and employees, BI training and data ownership.	2	Model-building in Rapid Miner. Decision trees.	2
	12	*Fundamentals of Web analytics.* The Web analytics concept, objectives and process.	2	All-round discussion. Creating own Data Mining models, by using a realistic dataset.	2
	13	*Application of Web analytics in business decision-making.* Web analytics metrics – Key Performance Indicators and becnchmarks. Outcomes of Web analytics.	2	. Presentations of the working versions of data mining models. All-round discussion	2
	14	*Technological foundations of CI.* Related concepts (HUMINT and OSINT). Information infrastructure for CI.	2	Presentations of the working versions of data mining models. All-round discussion	2
	15	***Evaluation 2***	2		2

Format of instruction	**x lectures** **x seminars and workshops** **x exercises** ☐ *on line* in entirety **x partial e-learning** ☐ field work	**x independent assignments** ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Students have to participate in classes and individual assignments. The assignments need to be submitted to the lecturers, by using the Moodle LMS, by the previously designated deadlines. Requirement for the successful completion of the course is 50% of class attendance for full-time students and 25% for part-time students. Students are also required to participate in 2 self-evaluation quizzes on	

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<tr><td></td><td colspan="6">the Moodle system, as to be allowed to participate in final evaluation.</td></tr>
<tr><td rowspan="5">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td>0.5 ECTS**</td></tr>
<tr><td>Experimental work</td><td>0,5 ECTS</td><td>Report</td><td></td><td>Individual assignments - exercises</td><td>1 ECTS*</td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Individual evaluation (Other)</td><td>1.5 ECTS****</td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td></td><td>(Other)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td>1.5 ECTS***</td><td>(Other)</td><td></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">* Students are required, on the weekly basis – as a preparation for exercises, to individually study the previously published study material (case studies, videos, professional articles, etc.), available on the Moodle LMS. Once in the semester, students are expected to prepare an individual presentation of a selected topic, from the field of BI methodologies and information systems. This presentation will be discussed in class (exercises). Students are expected to participate in discussions, covering all LOs in this subject (during exercises).
**Each week, students are required to provide a solution to an assignment, related to a selected problem, which is published on the Moodle LMS. The assignment form is a short essay, submitted by the designated deadline, by using the Moodle LMS. These forms of evaluation cover the individual achievement of all LOs.
*** Students are required, by continuous work during the semester, to design and present (at the end of semester), a conceptual solution of a business problem, with the application of BI methodologies and tools. This form of evaluation covers the group achievement of all LOs.
**** Two individual, problem-based evaluations are organized during the semester, with the allowed use of the study material (“open book evaluations”). To participate in the second evaluation, a student needs to have a positively evaluated first one. The score is calculated as a mean of scores for both evaluations. If the student fails to pass the evaluations, those can be substituted by a final evaluation at the end of the semester. This form of evaluation evaluates the individual success in achieving all the course LOs.
Complete evaluation of student work is based on the following weights:
• Evaluation of individual LO achievement – based on the two individual evaluations, during the semester, or the final cumulative evaluation (40% of the complete evaluation);
• Evaluation of individual LO achievement, based on the homework – short essays, submitted weekly by using the Moodle LMS, after the exercises (24% of the complete evaluation);
• Evaluation of individual LO achievement, based on the preparation and presentation of a selected topic from the field of BI methodologies and information systems (during the exercises), including the active participation in all group discussions (6% of the complete evaluation);
• Evaluation of group LO achievement, based on the design of a conceptual solution of a BI problem, by using the BI methodologies and tools, including the presentation at the end of semester (30% of the complete evaluation).
Score of an individual evaluation is presented as a percentage (on the scale of 0%</td></tr>
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<tr><td></td><td colspan="3">to 100%).
Overall evaluation is based on the weighted average score. The minimum score for the class to be successfully completed is 50% of the overall weighted average score.
Marks, describing the LO achievement, are associated with the following values of the overall weighted average score:
• 70 - 74% - satisfactory (2)
• 75 - 79% - good (3)
• 80 - 85% - very good (4)
• 86 - 100% -excellent (5).</td></tr>
<tr><td rowspan="10">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>1. Sherman, R.: „Business Intelligence Guidebook – From Data Integration to Analytics“ (1st Ed), Morgan Kaufmann/Elsevier, Amsterdam, 2015.</td><td></td><td></td></tr>
<tr><td>2. Sharda, R., Delen, D., Turban, E.: „Business Intelligence, Analytics, and Data Science: A Managerial Perspective“ (4th Ed), Pearson, Harlow/New York, 2017.</td><td></td><td></td></tr>
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<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Dominiković, Ivana; Ćukušić, Maja; Jadrić, Mario, The Role of Artificial Intelligence in Smart Cities: Systematic Literature Review // Data and Information in Online Environments: Second EAI International Conference (DIONE 2021),Springer International Publishing, 2021. str. 64-80
Kekez, Ivan; Ćukušić, Maja; Jadrić, Mario Data Mining Approach for Business Value Analysis in Basketball // Zbornik Veleučilišta u Rijeci / Journal of the Polytechnic of Rijeka, 9 (2021), 1; 227-248
Jadrić, Mario; Mijač, Tea; Ćukušić, Maja Text Mining the Variety of Trends in the Field of Simulation Modeling Research // Perspectives in Business Informatics Research. BIR 2020. Lecture Notes in Business Information Processing, vol 398.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">• Monitoring student’s class attendance (teacher)
• Class quality supervisions (Vice Dean for education and student affairs)
• Analysis of student success (Vice Dean for education and student affairs)
• Student survey on the quality of teachers and teaching (University of Split, Centre for Quality Improvement)
• All LOs are evaluated as previously described. The evaluation content and methodology are reassessed periodically, as to assess if they are relevant for achievement of LOs.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
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