

NAME OF THE COURSE		BUSINESS DECISION MAKING				
Code	EUB401	Level of study	graduate			
Course teacher	assistant professor, Tea Šestanović, PhD associate professor, Blanka Škrabić Perić, PhD associate professor, Branka Marasović, PhD	Credits (ECTS)	5			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			26		26	
Status of the course	-	Percentage of application of e-learning	40%			
COURSE DESCRIPTION						
Course objectives	Acquiring knowledge and skills for identifying and quantifying different problems and models of business decision-making, with particular emphasis on the multicriteria decision making problems.					
Course enrolment requirements and entry competences required for the course	Course signature requirements: as determined by the Statute of the Faculty of Economics and Rules and Regulations for Studies and Study Programmes. Entry competencies: English language proficiency level B2-C1 (CEFR) and computer skills (Microsoft Office Package).					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Learning outcome of the subject:</p> <p>1. To select and apply appropriate mathematical methods for enacting business decisions under conditions of risk and uncertainty.</p> <p>Specific learning outcomes:</p> <p>1. To identify the ways to solve decision-making problems under risk and uncertainty.</p> <p>2. To choose the procedure for attribute transformation with respect to the defined multiattribute decision making problem.</p> <p>3. To compare the basic methods for determining and assessing the importance of criteria for the multiattribute decision making problem.</p> <p>4. To compare the methods for solving the multiattribute decision making problem.</p> <p>5. To identify the possibilities of applying data envelopment analysis in business decision making.</p> <p>6. To identify the possibilities of applying neural networks in business decision making.</p>					
Course content broken down in detail by weekly class schedule (syllabus)	Lectures		Exercises			
	Topic	Hours	Topic	Hours		
	Fundamentals of decision theory. Decision making under risk.	2	Fundamentals of decision theory. Decision making under risk.	2		
	Decision making under uncertainty.	2	Decision making under uncertainty.	2		

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	Multiple criteria decision making. Decision matrix. Transformation of attributes.	2	Multiple criteria decision making. Decision matrix. Transformation of attributes.	2		
	Methods for assessing weights – group weight assessment.	2	Methods for assessing weights – group weight assessment.	2		
	Methods for assessing weights – weight assessment for single decision maker.	2	Methods for assessing weights – weight assessment for single decision maker.	2		
	Multiple attribute decision making – Methods for selecting alternative(s)	2	Multiple attribute decision making – Methods for selecting alternative(s)	2		
	Dominance method, maximin, maximax, conjunctive and disjunctive method	2	Dominance method, maximin, maximax, conjunctive and disjunctive method	2		
	Simple additive weighting method. Linear assignment method.	2	Simple additive weighting method. Linear assignment method.	2		
	TOPSIS method	2	TOPSIS method	2		
	PROMETHEE method	4	PROMETHEE method	4		
	Data envelopment analysis	2	Data envelopment analysis	2		
	Neural networks in business decision making	2	Neural networks in business decision making	2		
Format of instruction	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> <u>seminars and workshops</u> <input checked="" type="checkbox"/> exercises <input type="checkbox"/> <i>on line</i> in entirety <input checked="" type="checkbox"/> <u>partial e-learning</u> <input type="checkbox"/> field work		<input checked="" type="checkbox"/> <u>independent assignments</u> <input checked="" type="checkbox"/> <u>multimedia</u> <input type="checkbox"/> <u>laboratory</u> <input checked="" type="checkbox"/> work with mentor <input type="checkbox"/> (other)			
Student responsibilities	<p>Students are required to attend classes and actively participate in classes. Students' activity will be monitored through self-evaluation quizzes that will be available to students on the course websites within the Moodle platform. In case the student takes two self-evaluation quizzes during the semester and attends less than 50% of lectures and exercises, the student will be denied a signature. The condition for taking the exam is a signature.</p>					
Screening student work (<i>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</i>)	Class attendance	2	Research		Practical training	
	Experimental work		Report		Self-evaluation quizzes (Other)	0.5
	Essay		Seminar essay	1*	(Other)	
	Colloquiums	1.5*	Oral exam	1**	(Other)	
	Written exam	1.5**	Project		(Other)	
Grading and evaluating student work in class and at the final exam	<p>During the semester two colloquiums will be organized. They are solved on computers by using available software packages (Excel, WINQSB, Decision Lab, R, STATISTICA). The condition for taking all the colloquia and / or the exam is that the student has solved all the self-evaluation quizzes from the part of the material that is evaluated by the colloquium / exam. * Positively resolved colloquiums yield 90% of the total grade, whereas other 10% of total grade is accomplished through seminar</p>					

	<p>essay. **Alternatively, students can pass the written exam during the exam period. After successfully passing the written exam one can undertake the oral part of the exam. The final grade is formed as the average score of the written and oral exam. Key points and appropriate grades for written exam:</p> <p>0-49 inadequate (1) 50-62 sufficient (2) 63-75 good (3) 76-88 very good (4) 89-100 excellent (5)</p>		
Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Babić, Z.: <i>Modeli i metode poslovnog odlučivanja</i> , Ekonomski fakultet Split, 2011.	5	
	Teachers' handouts and other on-line materials for preparation of mid-term exams and final exams (available on the Moodle).		Moodle
Optional literature (at the time of submission of study programme proposal)	<ol style="list-style-type: none"> 1. Bonini, Ch.P., W.H.Hausman, H.Bierman: <i>Quantitative Analysis for Management</i>, Irwin McGraw-Hill Companies, 1997. 2. Cochran, J. J. (ed.): <i>Wiley Encyclopedia of Operations Research and Management Science</i>, John Wiley & Sons, Inc., 2011. 3. Babić, Z.: <i>Linearno programiranje</i>, Ekonomski fakultet Split, 2010. 4. Patterson, D.W.: <i>Artificial neural networks. Theory and applications</i>, Prentice Hall, 1995. 5. T. Perić, Z. Babić, I. Veža: <i>Vendor Selection and Supply Quantities Determination in a Bakery by AHP and Fuzzy Multi-Criteria Programming</i>, International Journal for Computer Integrated Manufacturing, Vol. 26, Issue 9, 2013. p. 816-829. 6. Z. Babić, T. Perić (2014): <i>Multiproduct Vendor Selection with Volume Discounts as the Fuzzy Multi-Objective Programming Problem</i>, International Journal of Production Research, Vol 52. No 14, p. 4315-4331. 7. Tea Poklepović, Zoran Babić (2015): <i>Stock selection using a hybrid MCDM approach</i>, Croatian Operational Research Review, Vol. 5, No. 2, 273-290. 8. Z. Babić, T. Perić (2015): <i>A New Linearization Approach for Solving Multi Objective Linear Fractional Programming Problem</i>, Proceedings of the 13th International Symposium on Operations Research, SOR '15, Bled, Slovenia, p. 265-270. 9. Z. Babić, T. Perić, B. Marasović (2017): <i>Production Planning in the Bakery Via De Novo Programming Approach</i>, Proceedings of the 14th International Symposium on Operations Research, SOR '17, Bled, Slovenia, p. 481-486. 10. Tunjo Perić, Zoran Babić, Josip Matejaš (2018): <i>Comparative analysis of application efficiency of two iterative multi objective linear programming methods (MP method and STEM method)</i>, CEJOR 11. T. Šestanović, J. Arnerić: <i>Neural network structure identification in inflation forecasting</i>. Journal of Forecasting. 2020; p. 1– 18. 12. J. Zhu (2003) <i>Solving DEA via Excel. In: Multi-Objective Programming and Goal Programming</i>. Advances in Soft Computing, vol 21. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-36510-5_44 13. Aljinović, Zdravka; Marasović, Branka; Šestanović, Tea (2021) <u>Cryptocurrency Portfolio Selection—A Multicriteria Approach</u> <i>Mathematics</i>, 9 (14),p. 1677, 21 doi:10.3390/math9141677 		

	(međunarodna recenzija, članak, znanstveni)
Quality assurance methods that ensure the acquisition of exit competences	<p>Registering students' success in carrying out of their duties (lecturer).</p> <p>Monitoring lectures and practice sessions (Vice Dean for Education).</p> <p>Students' Performance analysis in each course (Vice Dean for Education).</p> <p>Student questionnaire on the quality of lecturers and lessons for each course (University of Split, Quality Assurance Centre)</p> <p>Examination is used as an instrument to evaluate individual course outcomes by the course lecturer. The content of exam is reassessed periodically in order to assure compliance with the course outcomes.</p>
Other (as the proposer wishes to add)	The course is taught in Croatian and/or English.