

Study program: Mechanical engineering				
Type and level of studies: Doctoral studies				
Course unit: Multicriteria Decision Making				
Teacher in charge: prof. dr Milan Kolarević				
Language of instruction: English				
ECTS: 5				
Prerequisites: None				
Semester: Autumn				
Course unit objective: Introduction to the modern concepts of decision theory and learning the theoretical and practical methods for decision making.				
Learning outcomes of the course unit Mastering the methods of multi-criteria decision-making to solve practical engineering and business problems.				
Course unit contents				
<i>Theoretical classes</i>				
<ul style="list-style-type: none"> • Fundamentals of decision theory. The decision process. Models and modeling. Decision making under certainty. Decision making under risk. Decision making under uncertainty. Wood and sequential decision making. • Solving of the model of multicriteria decision making. The method of global criteria. Lexicographical methods. Method STEM. Methods of goal programming (CP). • Troubleshooting Multiple Attribute Decision Making. Transforming attributes. Defining the weight coefficients for the criteria. Methods Domination. Method of simple additive weight. ELECTRE Methods I-IV. Methods PROMETHEE I-IV. Analytic hierarchy process (AHP). • Selected examples of multi-criteria decision-making. 				
<i>Practical classes</i>				
The practical problem solving multi-criteria decision-making				
Literature				
C.Zopounidis, P.M. Pardalos, <i>Handbook of Multicriteria Analysis</i> , Springer, 2010, e-ISBN 978-3-540-92828-7				
N.Munier, <i>A Strategy for Using Multicriteria Analysis in Decision-Making</i> , Springer, 2011, e-ISBN 978-94-007-1512-7				
G.H. Tzeng, J.J. Huang, <i>Multiple Attribute Decision Making</i> , CRC Press, Taylor & Francis Group, 2011.				
J.Fodor, M.Roubens, <i>Fuzzy Preference Modelling and Multicriteria Decision Support</i> , Springer, e-ISBN 978-94-017-1648-2				
Number of active teaching hours				Other classes
Lectures: 3	Practice: 1	Other forms of classes:	Independent work: 1	
Teaching methods				
Lectures. Numerical computational exercises. Seminar. The practical realization of experiments in the laboratory.				
Examination methods (maximum 100 points)				
Exam prerequisites		No. of points:	Final exam	No. of points:
Student's activity during lectures			oral examination	
practical classes/tests			written examination	50
Seminars/homework		50	
Project				
Other				
Grading system				
Grade	No. of points		Description	
10	91-100		Excellent	
9	81-90		Exceptionally good	
8	71-80		Very good	
7	61-70		Good	
6	51-60		Passing	
5	Less than 50		Failing	