

Study program: Mechanical engineering			
Type and level of studies: Doctoral studies			
Course unit: Multi-Criteria 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			
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	