

Study program: Mechanical engineering			
Type and level of studies: PhD studies			
Course unit: Structural analysis of material handling machines			
Teacher in charge: prof. dr Mile Savković			
Language of instruction: English			
ECTS: 5			
Prerequisites: Structural and stress analysis			
Semester: Summer			
Course unit objective: Systematic gaining a higher level of knowledge in the field of structural analysis of material handling machines, as well as their design on the basis of which they achieve advanced performance.			
Learning outcomes of the Course unit Mastering the principles and knowledge in the field of structural analysis of material handling machines, which includes: static, dynamic and frequency analysis that can be used for design optimization of material handling machines.			
Course unit contents <i>Theoretical classes</i> Classification of analysis methods. Analytical methods. Numerical methods. Finite element method. Method of deformation. Geometric and discrete model. Discretization errors. Pre and post processing. Defining loads and constraints. Static, dynamic and modal analysis of supporting structures of the material handling machines. Nonlinear structural analysis. The dynamic response of the structure to the external excitation. Contact problems in material handling machines. <i>Practical classes</i> Examples of reliability analysis of material handling machines . Laboratory exercises using the software packages.			
Literature Meirovitch L., Fundamentals of vibrations, McGRAW-HILL INTERNATIONAL EDITION, 2001. O.C.Zienkiewicz, R.L.Taylor, J.Z.Zhu, "The Finite Element Method ", Elsevier, 2005. Huei-Huang Lee, Finite Element Simulations with ANSYS Workbench 14, SDC Publications, 2012.			
Number of active teaching hours			Other classes
Lectures: 3	Practice: 0	Other forms of classes: Independent work: 0	
Teaching methods Lectures are carried out in the standard classroom, using multimedia presentations and lecture board. Independent exercises are performed in the standard and computer classroom.			
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	