

Study program: Mechanical engineering			
Type and level of studies: Doctoral studies			
Course unit: Digital processing of experimental data			
Teacher in charge: prof. dr. Zlatan Šoškić			
Language of instruction: English			
ECTS: 5			
Prerequisites: None			
Semester: Summer			
Course unit objective: To introduce students with problems and concepts of digital data acquisition, and to teach them digital data processing techniques which enable reliable description of studied objects and processes by the acquired data.			
Learning outcomes of the Course unit A student is able to design an adequate data acquisition system, select its components and select an appropriate data processing procedure that would enable measurements within the sufficient error limits.			
Course unit contents <i>Theoretical classes</i> An overview of structure and characteristics of measurement systems. Classification and concepts of digital signal representation. Sampling, digitalization and reconstruction of signals. Data processing techniques: frequency analysis, filtering, correlation and spectral power analysis. <i>Practical classes</i> A student project consists of design and software implementation of data processing procedure relevant for research interest of the student. The project is tested on experimental or simulated data.			
Literature J.G. Proakis, Digital Signal Processing, Prentice Hall, 2006 E.O.Doebelin, Measurement Systems-Applications and Design, McGraw-Hill, 1990 J.P. Holman, Experimental Methods for Engineers, McGraw-Hill, 1985 A.S. Morris, Measurement and Instrumentation Principles, Butterworth-Heinemann, 2001			
Number of active teaching hours			Other classes
Lectures: 3	Practice: 1	Other forms of classes: Independent work: 1	
Teaching methods Lectures are carried out in classrooms, using multimedia presentations. Exercises are carried out in classrooms under the supervision of teacher, practicing examples of data processing procedures taught at classes. However, the course is attended by a single student, the lectures and exercises in classroom are replaced by mentoring of the student by the lecturer. On the other hand, the student project comprises autonomous work of the student with consultations with the teacher.			
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		
Project	50		
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	