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: Spring	

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

Theoretical classes

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.

Practical classes

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-Heinmann, 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 unders 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 exrcises 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