UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION	
Study program	Mechatronics and Control
Study Module (if applicable)	-
Course title	Micromechatronics
Level of study	☐Bachelor ☒Master's ☐ Doctoral
Type of course	☒Obligatory ☐ Elective
Semester	☒Autumn ☐Spring
Year of study	I
Number of ECTS allocated	7
Name of lecturer/lecturers	Nenad D. Pavlović, Miloš Milošević
Teaching mode	☒Lectures ☒Group tutorials ☐Individual tutorials ☒Laboratory work ☒Project work ☐Seminar ☐Distance learning ☐Blended learning ☐Other

PURPOSE AND OVERVIEW (max. 5 sentences)

The purpose of this course is to gain some basic knowledge from the field of micromachining technologies, examples of microstructures application and physical effects for transforming signals at microsensors, that is, for transformation of energy in micro actuators. Students should gain the ability for suitable selection and calculation of microstructures and microsensors, for recognizing the transformation of energy in micro actuators, as well as the application of micromachining technologies for the realization of microstructures and devices.

SYLLABUS (brief outline and summary of topics, max. 10 sentences)

- Physical basis of micromachining (characteristics of materials in micromachining, physical effects for signals transforming).
- Fabrication and manufacture (silicon processes: lithographic processes, manufacturing techniques of thin layers, etching processes, technology processes of laser processing in micromachinig, LIGA and SLIGA processes, bonding and assembly processes).
- Applications: basic structures and elements of bulk micromachining; microsensors and transducers (sensors of

pressure, acceleration and vibration, force, flow velocity and flow, thermal radiation, for gas analysis, miniature quartz crystal resonators as sensors with frequency modulated outputs); mikroactuators (microswitches, modulators of light and elements of optical displays, microfluidic devices, elements for micropositioning, micro-motors, miniature grippers for microassembly, medical applications, mini- and micromechanisms.

- Introduction to modeling of multiphysical effects on which the functioning of the micromechatronical systems is based.

LANGUAGE OF INSTRUCTION

☒Serbian (complete course) ☐English (complete course) ☐ Other _____ (complete course)

☒Serbian with English mentoring ☒Serbian with German mentoring

ASSESSMENT METHODS AND CRITERIA

Pre exam duties	**Points**	**Final exam**	**points**
Activity during lectures	**10**	**Written examination**	
Homework	**10**	**Oral examination (3 Teaching Colloquia)**	**Max. 30+20+20**
Laboratory work	**10**	**OVERALL SUM**	**100**

***Final examination mark is formed in accordance with the Institutional documents**