Specification for the book of courses

Study program			Control Systems	
Module			Computer Control Systems and Measurement Techniques	
Type and level of studies			Master studies	
The name of the course			Modern Sensor Technologies and Systems	
Lecturer (for lectures)			Dinčić R. Milan, Radenković N. Dragan	
Lecturer/associate (for exercises)			Miljković S. Goran, Jocić V. Aleksandar	
Lecturer/associate (for OFE)			Miljković S. Goran, Jocić V. Aleksandar	
Number of ECTS	5	**Course status (obligatory/elective)**		Elective
Prerequisites				
Course objectives	Introduction of students with modern sensor technologies (MEMS sensors, optical fiber sensors), modern sensor systems (IoT (Internet of Things), systems for measurement and analysis of vibration signals, wireless sensor systems), modern technologies for wireless transfer of measurement data (via mobile networks, using 5G wireless systems), modern platforms for realization of sensor systems (Arduino, Raspberry Pi, LabVIEW, FPGA).			
Course outcomes	Students will gain theoretical and practical knowledge of modern sensor technologies and systems. Also, students will master knowledge about hardware-software realization of sensor systems.			
Course outline				
Theoretical teaching	Characteristics, technology of production, principles of operation and applications of MEMS sensors and optical fiber sensors. Characteristics, applications and hardware-software technologies for the implementation of the IoT system. Characteristics and communication technologies for realization of wireless sensor systems. Measurement of the vibration signal. Application of vibration signals in predictive maintenance in industry. Hardware-software platforms for the implementation of sensor systems (Arduino, Raspberry Pi, LabVIEW, FPGA).			
Practical teaching (exercises, OFE, study and research	Practice, laboratory exercises, realization of project and seminar tasks, in order to enable students to master practical knowledge in the design and implementation of sensor systems.			
Textbooks/references				
1	Krzysztof Iniewski (editor), "Optical, acoustic, magnetic, and mechanical sensor technologies", CRC Press, 2012.			
2	Castañer, Luis, "Understanding MEMS : principles and applications", Wiley, 2015.			
3	Hamid Sharif, Hamid Sharif, Yousef S. Kavian, "Technological breakthroughs in modern wireless sensor applications", 2015.			
4	Dejan Drajić, "Introduction to IoT", 2018 (in Serbian).			
5	Dogan Ibrahim, "Raspberry Pi 3, from basic to advanced projects", 2014.			

Number of classes of active education per week during semester/trimester/year				
Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
2	1	1		
Teaching methods	Lectures using modern presentation tools, discussion of student solutions, consultations, practice, laboratory exercises.			

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	5	**Written exam**	25
Exercises	20	**Oral exam**	25
Colloquia	25		
Projects			