

Specification for the book of courses

Study program	Electronics and Microsystems			
Module	Electronics and Microsystems			
Type and level of studies	Master studies			
The name of the course	Microsensors and Microsystems			
Lecturer (for lectures)	Vračar M. Ljubomir			
Lecturer/associate (for exercises)	Vračar M. Ljubomir			
Lecturer/associate (for OFE)	Vračar M. Ljubomir			
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Acquiring the knowledge needed to understand the application of modern sensors in measuring and controlling systems.			
Course outcomes	Students became capable of understanding the microsystem principals and independently be able to connect sensors with microcontrollers forming a basic microsystem.			
Course outline				
Theoretical teaching	Introduction to microsensors technologies. Integrated microsensors: thermal, optical, magnetic, velocity and accelerometer sensors, chemical sensors, biosensors. Microsystems design and operation. Microsensors and microcontrollers. Interface circuits. Analog to digital conversion. Data processing in time domain. Microcontroller programming. Standards and protocols.			
Practical teaching (exercises, OFE, study and research)	Practical teaching refers to student training for independent programming the microcontrollers. Students will be assigned with final project including the independently design of basic microsystem and verification of its proper operation.			
Textbooks/references				
1	Gardner J., Varadan V., Awadelkarim O. "Microsensors, MEMS and smart devices: technology, applications & devices ", Wiley, UK (2001)			
2	Fraden J., Handbook of modern sensors: Physics, designs and applications, Springer-Verlag, (2004)			
3				
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	1		
Teaching methods	Auditorial teaching, Laboratory exercise, student tutorials			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures	10	Written exam		
Exercises	20	Oral exam	50	
Colloquia				
Projects	20			