

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		Sensors and Transducers in Vehicles		
Lecturer (for lectures)		Dinčić R. Milan, Denić B. Dragan, Radenković N. Dragan		
Lecturer/associate (for exercises)		Pešić T. Miroljub, Miljković S. Goran		
Lecturer/associate (for OFE)		Pešić T. Miroljub, Miljković S. Goran		
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Acquiring knowledge about production technologies, implementation, networking and applications of sensor systems in vehicles.			
Course outcomes	Students will gain theoretical and practical knowledge of types, principles of operation, implementation and application of sensors in cars and vehicles.			
Course outline				
Theoretical teaching	Types of sensors in vehicles, development trends, manufacturing technologies, MEMS sensors, GMP sensors. Functional, safety and control sensors in cars. Position sensors, force and moment sensors, pressure sensors, flow meters, temperature sensors, gas sensors and concentration sensors. Actuators in cars. Processing of sensor signals. Data exchange between automotive electronic systems. Connecting the sensors and actuators to the central computer system in the vehicle. The main requirements and directions of the development of sensors and actuators in the automotive industry. Sensors in autonomous and electrical vehicles.			
Practical teaching (exercises, OFE, study and research)	Practice, laboratory exercises, realization of seminar and project tasks, practical implementation of sensor systems.			
Textbooks/references				
1	D. Denić, M. Dinčić, D. Radenković, "Sensors in vehicles", the script, University of Niš (in Serbian), 2014.			
2	"Bosch Automotive Electrics and Automotive Electronics", 5th edition, Springer, 2014.			
3	S. Bhattacharya, A. K. Agarwal, O. Prakash, S. Singh, ed., "Sensors for Automotive and Aerospace Applications", Springer, 2019.			
4	J. Marek, H.-P. Trah, Y. Suzuki, I. Yokomori, "Sensors applications, volume 4 - Sensors for Automotive Applications", John Wiley and Sons, 2003.			
5	W. Ribbens, "Understanding Automotive Electronics", 8th edition, Elsevier, 2017.			
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, practice, laboratory exercises, realization of project and tasks, consultations.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures	5	Written exam	25	
Exercises	15	Oral exam	25	
Colloquia	30			
Projects				