

Study program / course: Mechanical engineering			
Type and level of study: Master academic studies			
Course: Mechatronics of motor vehicles and motors			
Lecturers: Radonjić R. Dragoljub, Pešić B. Radivoje			
Status of course: Elective, joint for modules M ₃ and M ₈ , III semester			
Number of ECTS: 6			
Precondition: None			
The objective of course Getting to know the modern mechatronic systems of vehicles. Operating principles of some mechatronic systems and ways to integrate them into modern vehicles.			
The outcome of course At the end of course the students should know: the principles of the functioning of mechatronic systems on the motor vehicles; operating principles of sensors and actuators, as well as ways to determine their function in the vehicle; to define requirements that mechatronic systems in the vehicle must meet in both technical and functional sense and to integrate mechatronic systems into the motor vehicle.			
Syllabus			
Theoretical study - General principles of application of mechatronics systems to control of vehicles and engines systems. Electronic systems for measurement and control of the motor vehicle. Open and closed control systems. Analog and digital measurement and control systems. - Basic electronic circuits and electronic components in the vehicles. Sensors. Actuators. A/D and D/A converters. Microprocessors and microcontrollers. - Mechatronic control systems of internal combustion engines. Electronic ignition systems. Electronic fuel injection. Electronic control of idle speed, recirculation of exhaust gases and evaporation of petrol gases. - Electronic transmission control. - Antilock braking electronic systems (ABS). - Electronic control of active suspension. - Communication systems in vehicles. - Signal, safety, security and information devices and systems in the vehicle. - Systems for improvement of comfort of drivers and passengers. - Diagnostic systems in the car.			
Practical Studies: Within the framework of study research, the students will be qualified for basic research in the area of this course.			
Recommended reading: 1.Taranović, D.: "Mehatronika MVM", skripta, 2004. 2.Grujović, A.: "Elektronika automobila", Mašinski fakultet, Kragujevac, 2008 (in press). 3.Radonjić, D., Pešić, R., Taranović, D.: "Mehatronika MVM", skripta (in preparation).			
Additional reading: 1.Janićijević, N.: "Automatsko upravljanje u motornim vozilima" Mašinski fakultet, Beograd, 1993. 2. Robert Bosch Gmbh: "Automotive Electrics Automotive Electronic", 2004. 3. Robert Bosch Gmbh: "Automotive handbook", 2007. 4. Bonnicksen, A.: "Automotive Computer Controlled Systems", Butterworth-Heinemann, Woburn, 2001. 5. Ribbens, W.: "Understanding Automotive Electronics", Newnes			
The number of hours of active teaching: 6			Other classes:
Theory: 3	Practical classes: 1.4	Other forms of teaching: 0.6	Research study: 0
Other classes: 1			
Methods of teaching The course takes place using multimedia tools, with the active participation of students. During exercises and working on seminar paper, students will solve problems in the field of the course and practically analyze existing mechatronic systems in motor vehicles.			
Evaluation of knowledge			
Pre-final exam obligations	points	Final exam	points
Activities during the classes:	10	Oral exam	30
Practical classes:			
Colloquiums(s) :	30		
Seminar(s) :	30		