Specification for the book of courses

Study program	Electrical Engineering and Computer Science		
Module	Communications and Information Technologies - Communications and Information Processing		
Type and level of studies	Undergraduate Academic Studies		
The name of the course	Softver-hardver interface in communication platforms		
Lecturer (for lectures)	Milić N. Dejan		
Lecturer/associate (for exercises)	Anastasov A. Jelena		
Lecturer/associate (for OFE)	Anastasov A. Jelena		
Number of ECTS	6	**Course status (obligatory/elective)**	Elective
Prerequisites			
Course objectives	Aim of this course is getting the srudents familiar with hardware and software aspects of interconnecting modulesin the systems that require data interchange and M2M communication. Presentation of the concept of modern short range wireless communications platforms as a base for implementing internet of things		
Course outcomes	Acquiring knowledge about modern ways of communication between electronic modules and devices, as well as between the endpoints in communications links. Students that choose this course will be able to: - identify main challenges associated with modern M2M communications - know the most important standards, protocols, algorithms and research activities related to the aforementioned challenges - describe ways in which these standards, protocols and algorithms resolve the specified problems - identify limitations that exist in M2M communications - combine different concepts and approaches inside a system and identify potential weaknesses regarding the system performance - search, find, evaluate, and present the research results, as well as relevant documents regarding international standardization - implement an M2M system with sensors, actuators and controllers		
Course outline			
Theoretical teaching	The course considers following subjects: •Introduction to M2M communications •Industrial communication systems - Wired networks and their interfaces (HART, CAN, Industrial Ethernet) - Industrial wireless networks (Wireless HART, ISA100.11a) •M2M and capillary networks - Wireless sensor networks, Bluetooth, 802.11ah, Wireless M-bus - Requirements regarding power and traffic in M2M applications •M2M and mobile networks - Solutions for existing and perspective networks •Internet of Things - 6LowPAN, CoAP, IP, energy consumption and efficiency •Vehicle networks - Security requirements for applications - Vehicle-X communication, possible solutions and performance		
Practical teaching (exercises, OFE, study and research	Practical topics/tasks are going to be performed in the laboratory		
Textbooks/references			
1	J. A. Dell, "Digital Interface Design and Application", Willey, 2015		
2	M. Schleicher, F. Blasinger, "Digital Interfaces and Bus Systems for Communication, Practical Fundamentals", JUMO, 2001		
3	D. Boswarthick, O. Elloumi, O. Hersent , "M2M Communications - A System Approach", Willey, 2012		
4			

5				
Number of classes of active education per week during semester/trimester/year				
Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
2	1	2	0	0
Teaching methods	Course includes lectures, auditory excercises, homework, seminar papers and practical project			
Grade (maximum number of points 100)				
Pre-exam duties		**Points**	**Final exam**	**Points**
Activity during lectures			**Written exam**	30
Exercises		30	**Oral exam**	20
Colloquia				
Projects		20		