

## Specification for the book of courses

<b>Study program</b>		Electronics and Microsystems		
<b>Module</b>		Electronics and Microsystems		
<b>Type and level of studies</b>		Master studies		
<b>The name of the course</b>		Laser Electronics		
<b>Lecturer (for lectures)</b>		Paunović V. Vesna, Aleksić M. Sanja		
<b>Lecturer/associate (for exercises)</b>		Đorđević D. Miloš		
<b>Lecturer/associate (for OFE)</b>		Đorđević D. Miloš		
<b>Number of ECTS</b>	5	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>				
<b>Course objectives</b>	Introduction to the laser light sources, their excitation and structures, and applications in various fields of technology, medicine and consumer products.			
<b>Course outcomes</b>	Detailed knowledge of laser devices and systems. Knowing the working principle of certain types of lasers. Use of lasers and their control in various systems.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Laser techniques as part of optoelectronics and its role in electronics. Emission and absorption of light. Spontaneous and stimulated emission. Laser light sources, modulators, optical transmitters and detectors. Laser diodes. Gas, liquid and solid lasers. Semiconductor lasers. Laser spectroscopy. Holography. The characteristics and limitations of the laser. Quantum optoelectronics. Sources and transmissions of light. Complex optical and electro-optical structure of telecommunications systems.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Exercises on computer and microcontroller development board, for design and simulation of laser and communication systems. Use of lasers and their control in various alarm systems, introduction and operation with RF communication protocols, introduction and operation with Bluetooth protocols, operation with ultrasonic modules.			
<b>Textbooks/references</b>				
1	W. Silfvast, Laser fundamentals, Cambridge, 2004			
2	Anil K. Maini, Lasers and Optoelectronics, John Wiley and Sons Ltd 2013			
3	Chartier, G., Introduction to Optics, Springer, 2005.			
4	J. T. Verdeyen, Laser Electronics, Prentice Hall, 1994			
5	M. J. Weber, Handbook of Lasers, CRC Press, 2000			
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	1	1		
<b>Teaching methods</b>	Classical lectures, consultations, laboratory exercises (exercises on a computer in microcontroller development boards )			
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>		<b>Points</b>	<b>Final exam</b>	<b>Points</b>
<b>Activity during lectures</b>		10	<b>Written exam</b>	25
<b>Exercises</b>		25	<b>Oral exam</b>	25
<b>Colloquia</b>				
<b>Projects</b>		15		