

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Electron Devices and Microsystems		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		Optoelectronics		
Lecturer (for lectures)		Paunović V. Vesna		
Lecturer/associate (for exercises)		Đorđević D. Miloš		
Lecturer/associate (for OFE)		Đorđević D. Miloš		
Number of ECTS	6	Course status (obligatory/elective)	Obligatory	
Prerequisites				
Course objectives	Introduction to the light properties, light sources and detectors, and optoelectronic circuits and systems.			
Course outcomes	Increased knowledge and practical mastery of optoelectronic techniques and technologies of optoelectronic components and systems. Introducing and working with LCD displays, seven-segment displays, introduction with IC communication protocols, work with optoelectronic sensors.			
Course outline				
Theoretical teaching	Optics, electronics, classical and quantum electrodynamics and statistical physics as the basis of optoelectronics. The dual nature of light. Emission, propagation and absorption of light. Prognosis and design of optoelectronic materials and discrete optoelectronic devices. Quantum optoelectronics. Spontaneously and stimulated emission of light. Optical fibers and cables. Optoelectronic devices. Types of lasers. Solid-state lasers, gas lasers, semiconductor lasers, liquid lasers. Types of displays. CRT monitors, liquid crystal LCD displays, LED displays, OLED displays. Optoelectronic devices in the computer (readers and scanners, storage units) and telecommunication (switches, semiconductor, ceramic and other special displays; modulators and demodulators) devices and systems. Nanomaterials and optoelectronic technology			
Practical teaching (exercises, OFE, study and research)	Exercises on the computer and microcontroller development board, independent use of commercial software tools for design and simulation of optoelectronic systems. Introduction and operation with LCD displays of alphanumeric and graphic type, introduction and operation with seven-digit displays, realization and control of matrix displays, introduction and operation with IC communication protocols, operation with optoelectronic sensors.			
Textbooks/references				
1	John Dakin, Robert Brown, Handbook of optoelectronics, Taylor & Francis, 2006			
2	S.C.Gupta, Optoelectronic devices and systems , Prentice Hall of India Private, 2015			
3	Chartier, G., Introduction to Optics, Springer, 2005			
4	Optoelectronic Devices and Properties, ed. Oleg Sergiyenko, InTech, 2011			
5	Anil K. Maini, Lasers and Optoelectronics, John Wiley and Sons Ltd, 2013			
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	1	0	0
Teaching methods	Classical lectures, consultations, exercises on the computer and microcontroller development board.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures	15	Written exam		25
Exercises	25	Oral exam		25
Colloquia				
Projects	10			