

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Electron Devices and Microsystems		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Optoelectronic Devices		
<b>Lecturer (for lectures)</b>		Živanović N. Emilija		
<b>Lecturer/associate (for exercises)</b>		Živanović N. Emilija		
<b>Lecturer/associate (for OFE)</b>		Živanović N. Emilija		
<b>Number of ECTS</b>	5	<b>Course status (obligatory/elective)</b>	Elective	
<b>Prerequisites</b>				
The aim of this course is to acquire necessary for understanding the operating principles of optoelectronic devices, as well as their characterization and application.				
<b>Course objectives</b>				
Introduction of theoretical and practical knowledge based on physical processes in optoelectronic devices. Introduction to the operating principle of LE diode, PIN photodiode, gas photocell, photo-resistors, phototransistors and optocoupler, semiconductor lasers and integrated optoelectronic components.				
<b>Course outcomes</b>				
Introduction of theoretical and practical knowledge based on physical processes in optoelectronic devices. Introduction to the operating principle of LE diode, PIN photodiode, gas photocell, photo-resistors, phototransistors and optocoupler, semiconductor lasers and integrated optoelectronic components.				
<b>Course outline</b>				
Students get acquainted with physical processes related to operation of various types of optoelectronic components. Basics concepts in statistical physics and quantum mechanics, basic concepts of semiconductor component physics, generation and recombination of charge carriers in a semiconductor, p-n junction and metal-semiconductor compound, the basis of zonal structure in semiconductors. LE diode, PIN photodiode, gas photocell, photo-resistor, phototransistor and optocoupler are studied. Semiconductor lasers, basic concepts, operating principle, field of application. Integrated optoelectronic devices.				
<b>Theoretical teaching</b>				
Students get acquainted with physical processes related to operation of various types of optoelectronic components. Basics concepts in statistical physics and quantum mechanics, basic concepts of semiconductor component physics, generation and recombination of charge carriers in a semiconductor, p-n junction and metal-semiconductor compound, the basis of zonal structure in semiconductors. LE diode, PIN photodiode, gas photocell, photo-resistor, phototransistor and optocoupler are studied. Semiconductor lasers, basic concepts, operating principle, field of application. Integrated optoelectronic devices.				
<b>Practical teaching (exercises, OFE, study and research)</b>				
Practical classes take place at the Laboratory for Applied Physics and Laboratory for Gas and Vacuum Engineering. It implies demonstration and practical presentation of the operation of certain optoelectronic devices, their characterization and application in electronic circuits, as well as their simulation using different software packages.				
<b>Textbooks/references</b>				
1	S. O. Kasap, „Optoelectronics and Photonics: Principles and Practices“, 2nd ed., University of Saskatchewan, Pearson Education, inc., New Jersey, 2013.			
2	John P. Dakin, Robert G. W. Brown, „Handbook of Optoelectronics“, vol I, Taylor&Francis Group, New York, London, 2006.			
3	Ronald W. Waynant, Marwood N. Ediger, „Electro-optics handbook“, second edition, McGrey-Hill, inc. New York, 2000.			
4	Shun Lien Chuang, „Physics of optoelectronic devices“, Wiley Series in Pure and Applied Optics, Joseph W. Goodman series editor, 1995.			
5	Emilija Živanović, „Praktikum laboratorijskih vežbi sa primerima zadataka iz predmeta Osnovi optike“, Edicija: Pomoćni udžbenici, Univerzitet u Nišu, Elektronski fakultet, Niš, 2018.			
<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	0	0
<b>Teaching methods</b>				
Teaching takes place through lectures, auditory and laboratory exercises and consultations.				
<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>			<b>Written exam</b>	25
<b>Exercises</b>		10	<b>Oral exam</b>	25
<b>Colloquia</b>		20		
<b>Projects</b>		20		