

Specification for the book of courses

Study program	Electronics and Microsystems			
Module	Electronics and Microsystems			
Type and level of studies	Master studies			
The name of the course	Technologies of Organic Semiconductor Materials and Devices			
Lecturer (for lectures)	Paunović V. Vesna, Pantić S. Dragan			
Lecturer/associate (for exercises)	Aleksić M. Sanja			
Lecturer/associate (for OFE)				
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	The basic knowledge of organic semiconductors, components and technologies that are based on these materials.			
Course outcomes	The student becomes familiar with the properties and technologies of organic semiconductor materials. Also, acquires knowledge about the components that are based on organic semiconductors, and is capable of independently using commercial Silvaco software tools for simulation of technological process and the electrical characteristics of the components			
Course outline				
Theoretical teaching	Introduction. Organic semiconductors. Transport carriers in the crystal, polycrystalline and amorphous organic semiconductors. Luminescence in organic materials, films and crystals. Spontaneous and stimulated emission. Energy transfer and excitation. Photo conduction, photo-induced charge transfer. Photovoltaic components, solar cells and photodiodes. Organic LEDs, the basic structure and charge injection. Organic LED displays, active and passive matrix displays. Organic transistors. Circuits and systems based on organic components. Photo excitation organic lasers.			
Practical teaching (exercises, OFE, study and research)	As part of a planned seminar and defend an independent project in the final exam, as well as the planned exercises that are performed on a computer, the student shall be met with organic semiconductors and components, as well as electronic circuits and systems that are based on organic components.			
Textbooks/references				
1	Handbook of Organic Materials for Electronic and Photonic Devices, ed Oksana Ostroverkhova, Woodhead Publishing, 2018			
2	M.Petty, Organic and Molecular Electronics: From Principles to Practice, Wiley and sons, 2019			
3	H.S. Nalwa, Ed., Organic electroluminescent materials and devices, Amsterdam.			
4	Hagen Klauk, Organic Electronics: Materials, Manufacturing and Applications, Wiley-VCH , 2006			
5	Handbook of Flexible Organic Electronics, Materials, Manufacturing and Applications, ed: Stergios Logothetidis, Woodhead Publishing, 2014			
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	0		
Teaching methods	Lectures, consultations, exercises, exercises on the computer, the project			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures	10	Written exam	25	
Exercises	20	Oral exam	25	
Colloquia				
Projects	20			