

NAME OF THE COURSE		How to construct your own organ					
Code	MFMI...	Year of study					
Course teacher	Associate professor Sandra Kostić, PhD, MSc in Molecular Biotechnology	Credits (ECTS)					
Associate teachers	Nela Kelam, PhD	Type of instruction (number of hours)		L	S	E	T
				5	15	5	
Status of the course	Elective	Percentage of application of e-learning		0			
COURSE DESCRIPTION							
Course enrolment requirements and entry competences required for the course	none						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Name and describe the main fields of biotechnology. - Describe the main characteristics of medical biotechnology, and name the examples within this field. - Explain the process of tissue engineering in detail; describe the main principle of choosing the components required for constructing an organ. - Identify and explain the positive and negative sides of using stem cells in tissue engineering - Describe the ethical concerns involved in construction of artificial organs						
Course content broken down in detail by weekly class schedule (syllabus)	- Introduction to biotechnology; biotechnology in biomedicine - Introduction to tissue engineering - The main principle of tissue engineering: choosing cells, scaffold and bioreactor - Stem cells in tissue engineering: potential and problems with regenerative medicine; Ethical issues - Tissue engineering of specific organs - The most relevant achievements in the field of bioengineering of artificial organs and their therapeutic potential - Bioengineering of specific tissues and organs as an alternative to drugs, gene therapy and organ transplantation; Construction of the skin, cartilage, bone, heart, lungs, reproductive organs...; Analysis of the scientific articles						
Format of instruction	☐ lectures ☐ seminars and workshops ☐ exercises ☐ <i>on line</i> in entirety ☐ partial e-learning ☐ field work		☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)				
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.						
Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of</i>	Class attendance		Research		Practical training		
	Experimental work		Report		(Other)		
	Essay		Seminar essay		(Other)		

ECTS credits is equal to the ECTS value of the course)	Tests		Oral exam		(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam						
Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Moran EC, Dhal A, Vyas D, Lanas A, Soker S, Baptista PM. Whole-organ bioengineering: current tales of modern alchemy. Transl Res. 2014; 163(4):259-67.					online
	Vacanti J. Tissue engineering and regenerative medicine: from first principles to state of the art. J. Pediatr. Surg. 2010;45(2):291–294.					online
	Atala A. Regenerative medicine strategies. J. Paediatr. Surg. 2012; 47:17–28.					online
	Atala A (2009) Engineering organs. Curr Opin Biotechnol 20: 575-592.					online
	Sheyn D, Mizrahi O, Benjamin S, Gazit Z, Pelled G, Gazit D. Genetically modified cells in regenerative medicine and tissue engineering. Adv Drug Deliv Rev. 2010; 62:683–98.					online
	Scarritt ME, Pashos NC, Bunnell BA. A review of cellularization strategies for tissue engineering of whole organs. Front Bioeng Biotechnol. 2015;3:43.					online
	Moran EC, Dhal A, Vyas D, Lanas A, Soker S, Baptista PM. Whole-organ bioengineering: current tales of modern alchemy. Transl Res. 2014; 163(4):259-67.					online
	Vacanti J. Tissue engineering and regenerative medicine: from first principles to state of the art. J. Pediatr. Surg. 2010;45(2):291–294.					online
Optional literature (at the time of submission of study programme proposal)	Meyer U, Meyer TH, Handschel J, Wiesmann HP (2009) Fundamentals of Tissue Engineering and Regenerative Medicine, Springer, New York.					
Quality assurance methods that ensure the acquisition of exit competences	▪ Teaching quality analysis by students and teachers ▪ Exam passing rate analysis ▪ Committee for control of teaching reports ▪ External evaluation					
Other (as the proposer wishes to add)						