

Svaki novi izborni predmet za ak. god. 2015./2016. treba biti napisan u ovoj tablici na HR i EN jeziku

Naziv predmeta			Kako napraviti vlastiti organ?				
Kod		Godina studija	1,2,3,4				
Nositelj/i predmeta	Doc.dr.sc. Sandra Kostić	Bodovna vrijednost (ECTS)	3				
Suradnici		Način izvođenja nastave (broj sati u semestru)	P	S	V	T	
			6	10	14		
Status predmeta	e-Izborni predmet	Postotak primjene e-učenja	100%				
OPIS PREDMETA							
Ciljevi predmeta	Razumijevanje i usvajanje znanja o postupcima bioinženjerstva i proizvodnje regenerativnih bioloških materijala.						
Uvjeti za upis predmeta i ulazne kompetencije potrebne za predmet	nema						
Očekivani ishodi učenja na razini predmeta (4-10 ishoda učenja)	<ul style="list-style-type: none"> - Navesti i obrazložiti glavna područja u biotehnologiji - Opisati osnovne karakteristike medicinske biotehnologije i navesti primjere unutar ovog polja - Detaljno objasniti proces tkivnog inženjerstva: odabir stanica, bioreaktora i nosača potrebnih za bioinženjerstvo organa - Identificirati i objasniti pozitivne i negativne strane korištenja matičnih stanica u tkivnom inženjerstvu - Navesti etičke probleme vezane za bioinženjerstvo organa 						
Sadržaj predmeta detaljno razrađen prema satnici nastave	<p><u>Predavanja (6h):</u></p> <ul style="list-style-type: none"> - Uvod u biotehnologiju (3 h P) - Uvod u tkivno inženjerstvo (3 h P) <p><u>Seminari (10h):</u></p> <ul style="list-style-type: none"> - Osnovni princip tkivnog inženjerstva – odabir stanica, nosača, bioreaktora (4 h S) - 3D printeri u biomedicini (2 h S) - Bioinženjerstvo tkiva i organa kao alternativa lijekovima, genskoj terapiji i transplantaciji organa (2 h S) <p><u>Vježbe(14h):</u></p> <ul style="list-style-type: none"> - Mogućnosti primjene kultura stanica za izradu tkiva i organa (2 h V) - Regenerativna medicina - primjena matičnih stanica (2 h V) - Najvažnija dostignuća u području bioinženjerstva umjetnih organa i njihov terapijski potencijal (5 h V) - Proizvodnja specifičnih organa (tkiva): kože, hrskavice, kosti, srca, pluća, mokraćnog mjehura, spolnih organa...(5 h V) 						
Vrste izvođenja nastave:	<input type="checkbox"/> predavanja <input type="checkbox"/> seminari i radionice <input type="checkbox"/> vježbe		<input type="checkbox"/> samostalni zadaci				
Obveze studenata	Nazočnost na nastavi 80% predavanja, 90% seminari i 100% vježbe						
Praćenje rada studenata (upisati udio u ECTS bodovima za svaku aktivnost)	Pohađanje nastave						
	Seminarski rad					(Ostalo upisati)	
	Pismeni ispit					(Ostalo upisati)	

tako da ukupni broj ECTS bodova odgovara bodovnoj vrijednosti predmeta):					(Ostalo upisati)	
					(Ostalo upisati)	
Ocjenjivanje i vrjednovanje rada studenata tijekom nastave i na završnom ispitu	Priprema i održavanje MS PPT prezentacije, na osnovu analize znanstvenih članaka o određenom organu (tkivu)					
Obvezna literatura (dostupna u knjižnici i putem ostalih medija)	Naslov				Broj primjeraka u knjižnici	Dostupnost putem ostalih medija
	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.					
	Atala A. Regenerative medicine strategies. J. Paediat. Surg. 2012; 47:17–28.					
	Scarritt ME, Pashos NC, Bunnell BA. A review of cellularization strategies for tissue engineering of whole organs. Front Bioeng Biotechnol. 2015;3:43.					
Dopunska literatura	Meyer U, Meyer TH, Handschel J, Wiesmann HP (2009) Fundamentals of Tissue Engineering and Regenerative Medicine, Springer, New York.					
Načini praćenja kvalitete koji osiguravaju stjecanje utvrđenih ishoda učenja	-Analiza kvalitete nastave od strane studenata i nastavnika, -Analiza prolaznosti na ispitima, -Izvjješća Povjerenstva za kontrolu provedbe nastave, -Izvaninstitucijska evaluacija (posjet timova za kontrolu kvalitete Nacionalne agencije za kontrolu kvalitete, uključenje u TEEP).					
Ostalo (prema mišljenju predlagatelja)						

NAME OF THE COURSE						
Code		Year of study	1 st , 2 nd , 3 rd , 4 th			
Course teacher	Assistant professor Sandra Kostić, PhD, MSc in Molecular Biotechnology	Credits (ECTS)	3			
Associate teachers		Type of instruction (number of hours)	L	S	E	T

Status of the course	Elective	Percentage of application of e-learning	
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 (5 h L); - The main principle of tissue engineering: choosing cells, scaffold and bioreactor (5 h L); - Stem cells in tissue engineering: potential and problems with regenerative medicine; Ethical issues (3 h L); - 3D printers in bioengineering (2 h L); - Tissue engineering of specific organs (5 h L) - The most relevant achievements in the field of bioengineering of artificial organs and their therapeutic potential (2 h S) - 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 (3 h S)		
Format of instruction	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops	<input type="checkbox"/> independent assignments	
Student responsibilities	In accordance to Rules of studying and Deontological code for USSM students.		
Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance		Research
	Experimental work		Report
	Essay		Seminar essay
	Tests		Oral exam
	Written exam		Project
Grading and evaluating student work in class and at the final exam	Students will have an assignment in which they need to analyze an article and create a short MS PPT presentation in which they will present this article.		
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		online

	tales of modern alchemy. Transl Res. 2014; 163(4):259-67.		
	Vacanti J. Tissue engineering and regenerative medicine: from first principles to state of the art. J. Paediatr. 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
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	<ul style="list-style-type: none"> ▪ 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)			