

<i>Name of the course</i>	<b>Elective Course 1 How to construct your own organ?</b>			<b>Code</b>	
<i>Type of study program Cycle</i>	Integrated studies – Medicine			<b>Year of study</b>	1
<i>Credits (ECTS) :</i>	<b>1.5</b>	<i>Semester</i>	2	Number of hours per semester (1+e+s)	15+0+10
<i>Status of the course:</i>	elective	<i>Preconditions:</i>		<i>Comparative conditions:</i>	
<i>Access to course:</i>	1 <sup>st</sup> year students			<i>Hours of instructions:</i>	
<i>Course teacher:</i>	Assistant professor Sandra Kostić, PhD				
<i>Consultations:</i>	By email				
<i>E-mail address and phone number:</i>	<a href="mailto:sandra.kostic@mefst.hr">sandra.kostic@mefst.hr</a>				
<i>Associate teachers</i>	Associate professor Katarina Vukojević, PhD				
<i>Consultations:</i>					
<i>E-mail address and phone number:</i>					
<b><i>The aims of the course:</i></b>	Understanding the concept of production of regenerative biological materials (tissues and organs)				
<b><i>Learning outcomes (general and specific competences):</i></b>	<p>After the end of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>- Describe and explain the types of biotechnology, name the examples for each of the type, with extra consideration for medical biotechnology;</li> <li>- Identify and describe the main principle of tissue engineering;</li> <li>- Name and explain the most relevant achievements in the field of bioengineering of artificial organs and their therapeutic potential</li> <li>- Name and explain the possibilities of using the cell culture for production of tissues and organs;</li> <li>- Identify, name and describe the methods of tissue engineering of specific tissues and organs;</li> <li>- Describe the Ethical aspects of tissue engineering and manipulating stem cells.</li> </ul>				
<b><i>Course content (Syllabus):</i></b>	Introduction to biotechnology; The possibilities of using the cell culture for production of tissues and organs; The most relevant achievements in the field of bioengineering of artificial organs and their therapeutic potential; Bioengineering of the tissues and organs as an alternative to drugs, gene therapy and organ transplantation; Construction of the skin, cartilage, bone, heart,...; Application of the stem cells in research and the use of animal models; Ethical aspects of manipulating stem cells; Analysis of the scientific articles.				

<b>Format of instruction</b> (mark in bold)	<b>Lectures</b>	<b>Exercises</b>	<b>Seminars</b>	<b>Independent assignments</b>
	<b>Consultations</b>	Work with mentor	Field work	Other
	Remarks: In practicals students search for scientific articles going through PubMed data base to collect the data from the newest literature about specific organ. On that basis, students will prepare ppt presentation and present it in front of other colleagues.			
<b>Student responsibilities</b>	Final exam; searching the literature, active participation in lectures, seminars and practicals. Preparation of ppt .			
<b>Screening student work</b> (mark in bold)	<b>Class attendance</b>	<b>Class participations</b>	<b>Seminar essay</b>	Practical training
	Oral exam	<b>Written exam</b>	Continuous assesment	Essay
<b>Detailed evaluation</b> within a <i>European system of points</i> ( <i>Example</i> )				
<b>STUDENTS RESPONSIBILITIES</b>	<b>HOURS</b>	<b>PROPORTIONS OF ECTS CREDITS</b>	<b>PROPORTION S OF MARK</b>	
Class attendance and participations		0,5		
Seminar essay		0,5	30%	
Written exam		1	70%	
Oral exam				
<p>Further clarification: Assessment of students' performance will be based on their general activity during the course. It will include active participation in the debates, and preparation of the given units (articles) for the ppt on seminars.</p> <p>According to the regulations of the study, final grade is obtained:  A = 91-100% 5  B = 79 to 90% 4  C = 67 to 78% 3  D = 55 to 66% 2  F = 0 to 54% 1</p>				
<b>Required literature:</b>	1) Vacanti J. Tissue engineering and regenerative medicine: from first principles to state of the art. J. Pediatr. Surg. 2010;45(2):291–294. 2) Atala A. Regenerative medicine strategies. J. Paediat. Surg. 2012; 47:17–28. 3) Atala A (2009) Engineering organs. Curr Opin Biotechnol 20: 575-592. 4) 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. Prilagođena literatura za studij dentalne medicine.			

	<p>1) <u>Shilpa PS, Kaul R, Sultana N, Bhat S.</u> (2013) Stem cells: Boon to dentistry and medicine. <u>Dent Res J</u> 10 (2):149-54.</p> <p>2) Krasner P, Verlander P. (2011) Stem cells in dentistry and medicine: The dentist's role. <u>Dent Today</u> 30(128):130–4.</p> <p>3) Peng L, Ye L, Zhou XD. (2009) Mesenchymal stem cells and tooth engineering. <u>Int J Oral Sci</u> 1:6–12.</p> <p>4) <u>Rai S, Kaur M, Kaur S.</u> (2013) Applications of stem cells in interdisciplinary dentistry and beyond: an overview. <u>Ann Med Health Sci Res</u> 3(2):245-54.</p> <p>5) <u>Rai S, Kaur M, Kaur S, Arora SP.</u> (2012) Redefining the potential applications of dental stem cells: An asset for future. <u>Indian J Hum Genet</u> 18(3):276-84.</p>
<b>Optional literature:</b>	Meyer U, Meyer TH, Handschel J, Wiesmann HP (2009) Fundamentals of Tissue Engineering and Regenerative Medicine, Springer, New York
<b>Additional information about the course</b>	

Annexes: calendar classes

<i>The number of teaching units</i>	TOPICS AND LITERATURE
<b>I.</b>	Title: Introduction to biotechnology;
	Short description: Definition and the types of biotechnology; application of biotechnology in science and every-day life.
	Literature: required and optional
<b>II.</b>	Title: The basic principle of tissue engineering
	Short description: The principle of creating organs: cells, scaffolds and bioreactors
	Literature: required and optional
<b>III.</b>	Title: Tissue engineering of specific tissues and organs;
	Short description: Tissue engineering of blood vessels, heart, bone, cartilage, lungs...
	Literature: required and optional
<b>IV.</b>	Title: The most relevant achievements in the field of bioengineering of artificial organs and their therapeutic potential;
	Short description: The possibilities of using the cell culture for production of tissues and organs; Bioengineering of the tissues and organs as an alternative to drugs, gene therapy and organ transplantation
	Literature: required and optional
<b>V.</b>	Title: Ethical aspects of tissue engineering
	Short description: Ethical aspects of creating new organs and organisms and manipulating stem cells;
	Literature: required and optional

