

1.	<b>Field of study</b>	<b>Materials Science and Engineering</b>
2.	Academic year of entry	2017/2018 (winter term)
3.	Level of qualifications/degree	second-cycle studies (in engineering)
4.	Degree profile	general academic
5.	Mode of study	full-time

**Module:** Tissue engineering

**Module code:** IM2A\_IT

**1. Number of the ECTS credits:** 2

2. Learning outcomes of the module			
code	description	learning outcomes of the programme	level of competence (scale 1-5)
IM2A_IT_1	Understanding physiological, biological and physio-chemical phenomena and processes accompanying the interaction of human tissues and their substitutes in the form of biomaterials as well as understanding methods for tissue reconstruction. Learning the testing methods and principles of tissues for reconstruction production with respect to the needs for applications in human organisms. Understanding the designing methods and principles of tissue engineering application together with methods of tissue reconstruction in medicine.	IM2A_W02 IM2A_W06 IM2A_W07 IM2A_W08	4 4 4 3
IM2A_IT_2	The skill to design properties of tissues for medical applications.	IM2A_K05 IM2A_U17	1 4
IM2A_IT_3	Development of social awareness with emphasis on threats and benefits of tissue engineering application in medicine.	IM2A_K02 IM2A_K04 IM2A_K06	3 3 3

### 3. Module description

<b>Description</b>	The module Tissue engineering shall enable that students are knowledgeable about physiological, biological and physio-chemical aspects related to the tissue reconstruction in medicine. Owing to that students shall achieve understanding of correlations between tissues of a living organism and tissue reconstruction methods as well as possibilities to reduce effects of interactions. The understanding of those relationships shall result in deepening the skill of tissue reconstruction principles and the testing methods to control phenomena on the phase boundary on a micro- and nano-metres scale.
<b>Prerequisites</b>	Achievement of effects of education in the modules: introduction to biomaterials, ceramic biomaterials, metallic biomaterials, polymers for medicine, materials surface engineering, selected issues from biomaterials toxicology, materials degradation in a biological environment, biological and physiological aspects of biomaterials, materials testing methods.

4. Assessment of the learning outcomes of the module			
code	type	description	learning outcomes of the module
IM2A_IT_w_1	Written test	Verification of the knowledge based on the lectures content, recommended literature and attended classes	IM2A_IT_1, IM2A_IT_2
IM2A_IT_w_2	Test	Assessment of mastering the basic knowledge necessary for individual performance of a practical exercise	IM2A_IT_1, IM2A_IT_2, IM2A_IT_3
IM2A_IT_w_3	Report	The assessment of the skill of designing simple implants and artificial organs for medical and veterinary applications	IM2A_IT_3

5. Forms of teaching						
code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
IM2A_IT_fs_1	lecture	The lecture shall enable understanding the issues related to tissue engineering and testing methods for physiological, biological and physio-chemical phenomena and processes on the phase boundary on a micro- and nano-metres scale. The lecture is delivered with the use of multimedia	15	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues.	15	IM2A_IT_w_1
IM2A_IT_fs_2	practical classes	The application of the acquired theoretical knowledge in practical learning of methods for tissue reconstruction used in medicine as well as in designing new ones. Exercises are performed by students individually with the use of equipment of teaching and scientific laboratories.	15	Preparation to classes through independent studying of recommended issues.	15	IM2A_IT_w_2, IM2A_IT_w_3