1.	Field of study	Materials Science and Engineering
2.	Academic year of entry	2018/2019 (winter term)
3.	Level of qualifications/degree	first-cycle studies (in engineering)
4.	Degree profile	general academic
5.	Mode of study	full-time

Module: Biological and physiological aspects of biomaterials

Module code: IM1A_BFAB

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)
IM1A_BFAB_1	Learning basic physical and chemical phenomena and processes affecting the interactions between a human organism and biomaterials; understanding basic phenomena accompanying the presence of implants and artificial organs in a human body.	IM1A_W14 IM1A_W17	1 5
IM1A_BFAB_2	Students can define immunological and haematological problems related to the application of engineering materials in medicine.	IM1A_K05 IM1A_U25	1 2
IM1A_BFAB_3	Development of the awareness of engineering materials influence on a human body consequences.	IM1A_K02	1

3. Module description

Description	The Biological and physiological aspects of biomaterials module shall enable students learning the nature of biomaterial/tissue interactions, learning the nature of phenomena occurring on the biomaterial - biological environment interface, being knowledgeable about immunological and haematological problems related to the application of artificial organs and implants as well as materials resorption. Owing to that students shall learn and understand mechanisms of human body influence on implants and artificial organs.
Prerequisites	It is required to achieve effects of education of the modules: physics, chemistry, physico-chemistry of biological processes, introduction to biomaterials, metallic, ceramic, carbon and composite biomaterials, polymers for medicine, and nanomaterials in medicine.

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
IM1A_ BFAB _w_1	Credits test	Verification of the knowledge based on the lectures content, recommended literature and classes.	

			IM1A_BFAB_1, IM1A_BFAB_2, IM1A_BFAB_3
IM1A_ BFAB _w_2	Written test	Checking the knowledge about characteristics of systemic fluids, the nature of biomaterial/ tissue interactions, the mechanism of phenomena at the biomaterial - biological environment interface, cells reaction to the implant, immunological and haematological problems related to the application of artificial organs and implants, and materials resorption.	IM1A_BFAB_1, IM1A_BFAB_2, IM1A_BFAB_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	
IM1A_BFAB _fs_1	lecture	The lecture shall enable understanding basic terms related to mechanisms of human body influence on implants and artificial organs. The lecture is delivered with the use of multimedia and demonstrations.	30	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues.	10	IM1A_ BFAB _w_1
IM1A_BFAB _fs_2	laboratory classes	The analysis of basic issues related to the knowledge about biomaterial/tissue interactions, the mechanism of phenomena at the biomaterial - biological environment interface, immunological and haematological problems related to the application of artificial organs and implants. Classes are conducted based on oral presentations and discussion with the use of multimedia, and demonstrations.	15	Preparation to classes through independent studying of recommended issues.	5	IM1A_ BFAB _w_2