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

Module: Specialised subject 1. Metallic biomaterials

Module code: IM2A_ PS1_ BM

1. Number of the ECTS credits: 3

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
IM2A_PS1_BM_1	Students have knowledge about reactions and effects of living organisms interaction with metals and their alloys	IM2A_W14	2
IM2A_PS1_BM_2	Obtaining a detailed knowledge about physical, chemical and mechanical properties of metallic biomaterials and possibilities of their application for short- and long-term medical implants and surgical instruments	IM2A_W06	2
IM2A_PS1_BM_3	Students can show application possibilities for metallic nanocrystalline materials	IM2A_W07 IM2A_W12	2 2
IM2A_PS1_BM_4	Students are aware of consequences of metallic biomaterials improper use for production of implants and surgical instruments	IM2A_K05 IM2A_W18	1 1

3. Module description

Description	The module Metallic biomaterials provides students with a full knowledge about physical and chemical processes occurring on the metal - tissue interface, structure and properties as well as application possibilities of metallic biomaterials. Owing to that students shall achieve understanding of the specific nature of conditions to be met by metallic materials typical for those applied in medicine and veterinary medicine. The understanding of those relationships shall result in acquiring the skill to select, from individual metallic biomaterials, a material satisfying conditions of specific applications.
Prerequisites	It is required to achieve effects of level I modules education in physics, chemistry and rudiments of materials science or materials science

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
IM2A_PS1_BM_w_1	Test	Assessment of mastering the issues necessary for individual performance of a practical exercise	IM2A_PS1_BM_1, IM2A_PS1_BM_2
IM2A_PS1_BM_w_2	Report	Assessment of the skill to perceive and understand the specific nature and properties of metallic biomaterials and possibilities of their application by a correct formulation of conclusions	IM2A_PS1_BM_1, IM2A_PS1_BM_2, IM2A_PS1_BM_3, IM2A_PS1_BM_4

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_PS1_BM_fs_1	lecture	The lecture shall enable understanding of issues related to metallic materials interaction with tissues, biomaterials properties. forming the properties in view of their application in medicine. 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	25	IM2A_PS1_BM_w_1
IM2A_PS1_BM_fs_2	laboratory classes	Application of the acquired theoretical knowledge in practical learning of relationships: Tissue - metallic biomaterials; structure - properties, potential application possibilities. Exercises are performed by students individually with the use of equipment of teaching and scientific laboratories.	15	Preparation of theoretical basics and issues related to the topic of performed exercise. Independent preparation of a theoretical introduction. Individual preparation of exercise results and formulation of proper conclusions	20	IM2A_PS1_BM_w_2