

<b>1. Field of study</b>	<b>Materials Science and Engineering</b>
2. Faculty	Faculty of Science and Technology
3. Academic year of entry	2019/2020 (winter term), 2020/2021 (winter term), 2021/2022 (winter term), 2022/2023 (winter term)
4. Level of qualifications/degree	first-cycle studies (in engineering)
5. Degree profile	general academic
6. Mode of study	full-time

**Module:** Introduction to biomaterials

**Module code:** IM1A\_WBIO

**1. Number of the ECTS credits:** 3

<b>2. Learning outcomes of the module</b>			
code	description	learning outcomes of the programme	level of competence (scale 1-5)
IM1A_WBIO_1	Learning physico-chemical characteristics of biomaterials, the structure and properties of biomaterials, functions of biomaterials, criteria for biomaterials quality	IM1A_W06	5
IM1A_WBIO_2	Obtaining basic knowledge about basic engineering materials used in medicine and veterinary science.	IM1A_W11	4
IM1A_WBIO_3	The skill of determining requirements set to biomaterials, learning the selection criteria, examples of practical applications in medicine. Procedures, norms and standards binding in the biomaterials engineering.	IM1A_U01 IM1A_U14 IM1A_U25	2 3 5
IM1A_WBIO_4	Development of the awareness of biomaterials application social and ethical aspects. European standards and legal regulations for tests on animals (ISO 10993 standard).	IM1A_K02	2

<b>3. Module description</b>	
<b>Description</b>	The Introduction to biomaterials module shall enable that students are knowledgeable about the structure of materials used in medicine for implants and medical instruments and about criteria for their selection, about application limitations, phenomena occurring at the biomaterial-tissue interface, as well as social and ethical aspects of biomaterials application. The understanding of relationships between properties of materials for medical applications and their structure shall result in honing the skill of improving those materials properties to achieve a better biocompatibility.
<b>Prerequisites</b>	It is required to achieve effects of education of physics, chemistry, crystallography, and materials science modules

4. Assessment of the learning outcomes of the module			
code	type	description	learning outcomes of the module
IM1A_WBIO_w_1	Written test	Checking the acquired skill of structure shaping methods and mechanisms responsible for mechanical properties changing	IM1A_WBIO_1, IM1A_WBIO_2, IM1A_WBIO_3, IM1A_WBIO_4
IM1A_WBIO_w_2	Test	Assessment of mastering the basic knowledge necessary for individual performance of a practical exercise	IM1A_WBIO_1, IM1A_WBIO_2
IM1A_WBIO_w_3	Report	Assessment of the skill to understand the structure shaping mechanisms and to connect them with engineering materials properties by a correct formulation of conclusions	IM1A_WBIO_3, IM1A_WBIO_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	
IM1A_WBIO_fs_1	lecture	The lecture shall enable an understanding of issues related to the structure of engineering materials, phenomena, processes, and mechanisms enabling their properties shaping. The lecture is delivered with the use of multimedia, demonstrations and the „Materials science” software.	30	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues	25	IM1A_WBIO_w_1
IM1A_WBIO_fs_3	laboratory classes	The application of acquired theoretical knowledge to practical learning of engineering materials structure and of mechanisms enabling shaping their properties. Exercises are performed by students individually with the use of equipment of teaching and scientific laboratories.	30	Preparation of theoretical basics and issues related to the topic of performed exercise. Independent preparation of a theoretical introduction. Individual preparation of exercise results.	10	IM1A_WBIO_w_2, IM1A_WBIO_w_3