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

Module: Materials degradation in a biological environment

Module code: IM2A_DMWŚB

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_DMWŚB_1	Acquiring new knowledge from the field of nomenclature and basic notions related to materials degradation in the human body environment	IM2A_W07 IM2A_W14	2 2
IM2A_DMWŚB_2	Understanding and describing a destructive action of biological environment on biomaterials and processes of materials degradation in vivo and in vitro	IM2A_W09 IM2A_W14	3 3
IM2A_DMWŚB_3	Recognising and describing the influence of time and of degradation way on selected physical and chemical properties of biomaterials	IM2A_U01 IM2A_U11 IM2A_U14	2 3 3
IM2A_DMWŚB_4	Development of the awareness of the need to affect the biomaterials structure to improve their functional properties	IM2A_K01	3

3. Module description

Description	The module Materials degradation in a biological environment shall enable that students learn basic terms and definitions related to materials degradation, such as: biodegradation, bioreactivity or resorption, and also understanding the nature of biologically active environment action on biomaterials. The module shall ensure that students are knowledgeable about types of materials subject to biodegradation in the human body environment and factors affecting physio-chemical properties of biomaterials. The module shall also enable that students are proficient in the field of in vitro and in vivo studies to assess materials degradability, of determination of basic degradation processes mechanisms, like: corrosion (metals), dissolution (ceramics) and hydrolysis (polymers) as well as of identification of degradation products.
Prerequisites	The knowledge of materials chemistry module, rudiments of the materials science, corrosion and corrosion protection as well as biomaterials

4. Assessment of the learning outcomes of the module			
code	**type**	**description**	**learning outcomes of the module**
IM2A_DMWŚB_w_1	Written examination	Verification of the knowledge based on the lectures content, recommended literature and attended laboratory classes	IM2A_DMWŚB_1, IM2A_DMWŚB_2, IM2A_DMWŚB_3, IM2A_DMWŚB_4
IM2A_DMWŚB_w_2	Written tests	Checking the knowledge acquired during laboratory classes to examine experimentally processes of materials degradation in a biologically active environment and to make decisions on the way to improve the biomaterials durability	IM2A_DMWŚB_1, IM2A_DMWŚB_2, IM2A_DMWŚB_3, IM2A_DMWŚB_4
IM2A_DMWŚB_w_3	Weekly reports	The assessment of mastering the skill of independent performance of a practical exercise and also of a team work, of measurement results and measurement error analysis as well as of formulating the conclusions properly	IM2A_DMWŚB_3, IM2A_DMWŚB_4
IM2A_DMWŚB_w_4	Interview	The assessment of understanding the reasons and mechanisms of course and studying materials degradation processes	IM2A_DMWŚB_1, IM2A_DMWŚB_2

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_DMWŚB_fs_1	lecture	The lecture shall enable the understanding of basic terms and definitions used in biomaterials degradation, to familiarise students with theoretical issues of biological environment action on biomaterials, with biomaterials degradation processes in vivo and in vitro and the role of free radicals in materials degradation and biodegradation. The lecture is delivered with the use of multimedia based on a selected set of handbooks	30	The work with the recommended literature comprising independent acquisition of knowledge related to issues presented during the lectures	10	IM2A_DMWŚB_w_1
IM2A_DMWŚB_fs_2	laboratory classes	The application of learned theoretical knowledge in practical learning of materials degradation in a biological environment. 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	5	IM2A_DMWŚB_w_2