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: Materials structure testing methods

Module code: IM2A_MBSM

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_MBSM_1	Understanding phenomena used in methods for engineering materials structure and properties description, including methods using X-ray and microscopic techniques; learning the design and operation rules of specialised scientific-research instruments.	IM2A_W05 IM2A_W13	3 4
IM2A_MBSM_2	The skill to operate specialised scientific-research instruments, to plan experiments to analyse engineering materials structure and properties, to interpret results of research and measurement errors	IM2A_K05 IM2A_U02 IM2A_U03 IM2A_U07	1 4 2 4
IM2A_MBSM_3	Students are aware of individual research method limitations and see the need for a thorough scientific analysis of problems in the field of materials engineering.	IM2A_K04	5

3. Module description

Description	The module Materials structure testing methods shall enable that students expand their knowledge about phenomena and principles of operation and design of research instruments, which are applied in advanced measuring techniques and methods used to characterise the structure and basic properties of engineering materials. Owing to that students shall master operation of scientific-research instruments and acquire the skill to interpret measurement results. The understanding of phenomena and principles of operation shall result in a skilful application of appropriate testing technique to assess materials structure and properties.
Prerequisites	Basic knowledge from the field of physics and chemistry modules.

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
IM2A_MBSM_w_1	Oral examination	Verification of the knowledge based on the lectures content, recommended literature and attended classes.	IM2A_MBSM_1, IM2A_MBSM_2, IM2A_MBSM_3
IM2A_MBSM_w_2	Written test	Checking the knowledge of measurement results interpretation, of phenomena and operating principle of the learned research instruments.	IM2A_MBSM_1, IM2A_MBSM_2, IM2A_MBSM_3
IM2A_MBSM_w_3	Test	Assessment of mastering the basic knowledge necessary for individual performance of a practical exercise.	IM2A_MBSM_1, IM2A_MBSM_2, IM2A_MBSM_3
IM2A_MBSM_w_4	Report	Assessment of the skill to analyse engineering materials structure and properties.	IM2A_MBSM_1, IM2A_MBSM_2, IM2A_MBSM_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_MBSM_fs_1	lecture	The lecture shall enable understanding phenomena and principles of instruments used in methods for characterising engineering materials structure and properties. The lecture is delivered with the use of multimedia.	30	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues.	30	IM2A_MBSM_w_1
IM2A_MBSM_fs_2	laboratory classes	Application of the acquired theoretical knowledge to learn the skill of research instruments operation, to interpret results and to evaluate measurement errors. 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	IM2A_MBSM_w_2, IM2A_MBSM_w_3, IM2A_MBSM_w_4