1.	Field of study	Materials Science and Engineering
2.	Academic year of entry	2015/2016 (summer term), 2016/2017 (summer term)
3.	Level of qualifications/degree	second-cycle studies
4.	Degree profile	general academic
5.	Mode of study	full-time

Module: Specialised subject 3. Physical methods of materials testing

Module code: IM2A_PS3_FMBM

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_PS3_FMBM_1	Understanding operation principles of specialised instruments used to measure and analyse engineering materials properties. Understanding theoretical basics and the idea of measurement used in modern research techniques. Presenting benefits of so-called cross-experiments with the application of various measuring techniques.	IM2A_W05 IM2A_W11 IM2A_W13	5 5 5
IM2A_PS3_FMBM_2	Independent performance of an analysis of example measurement curves with the use of numerical analysis methods learned in other subjects. Independent selection of the analysis method for the research problem. Determination of material characteristics.	IM2A_U03 IM2A_U07	5 5
IM2A_PS3_FMBM_3	Development of the skill of new knowledge acquisition, problem analysis, drawing conclusions based on mathematical equations, acquiring the skill to interpret ideas and concepts.	IM2A_K01 IM2A_K04	5 5

3. Module description

Description	The module Physical methods of materials testing shall enable students learning modern measuring techniques - the physical idea underlying a specific technique and principles of instruments operation. Students shall learn results analysis methods used for a specific method. They shall acquire the skill to select an appropriate research method for a specific problem of engineering materials characteristics determination.
Prerequisites	The knowledge of a course in mathematics, physics and chemistry on a university level is required as well as passing the testing methods subject from the first level of education.

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
IM2A_PS3	Oral examination	Verification of the knowledge based on the lectures content, recommended literature and	

_FMBM_w_1		attended classes	IM2A_PS3_FMBM_1, IM2A_PS3_FMBM_2, IM2A_PS3_FMBM_3
IM2A_PS3 _FMBM_w_2	Weekly reports	Assessment of mastering the skill of independent performance of an experiment, of measuring results analysis	IM2A_PS3_FMBM_3
IM2A_PS3 _FMBM_w_3	Interview	Assessment of laws of physics understanding and their interpretation and application in materials engineering issues	IM2A_PS3_FMBM_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_PS3 _FMBM_fs_1	lecture	The lecture shall enable understanding basic physical principles used in modern measuring techniques and principles of measuring instruments operation. The whole is illustrated with demonstrations and multimedia presentations	30	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues	15	IM2A_PS3_FMBM_w_
IM2A_PS3 _FMBM_fs_3	laboratory classes	Participation in experiments on determination of material characteristics. Analysis of results obtained. (approx. 5 exercises/semester) illustrating the lecture issues. Independent formulation of conclusions.	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.	15	IM2A_PS3_FMBM_w_ IM2A_PS3_FMBM_w_