1.	**Field of study**	**Materials Science and Engineering**
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: Principles of materials designing and selection

Module code: IM1A_ZPIDM

1. Number of the ECTS credits: 5

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
IM1A_ZPIDM_1	Knowledge of general rules of designing and methodology for materials selection when designing engineering structures. Acquiring general knowledge about materials used in the engineering practice and their properties, which determine the application. Detailed learning of engineering materials selection graphs - the ability to analyse, interpret as well as apply them in practice. Understanding the idea of functionality indices and the ability to apply them in practice. Learning the rules of materials selection taking into account the shape of product cross section and without it. Learning general knowledge about processes of products manufacturing and procedures for the method selection.	IM1A_W10 IM1A_W13	3 5
IM1A_ZPIDM_2	The skill to use materials selection graphs in the procedure for optimum materials searching for engineering structures, including the application of computer techniques. Students are capable of effective use of a preliminary economic analysis of undertaken engineering activities in the field of materials selection.	IM1A_U01 IM1A_U09 IM1A_U14 IM1A_U16 IM1A_U21	4 4 5 4 2
IM1A_ZPIDM_3	Students creatively combine the gained knowledge at the selection of materials for technical applications.	IM1A_K05	2

3. Module description

Description	The Principles of materials designing and selection module shall enable students learning the general principles of designing and rules used in the methodology for engineering materials selection. Students shall master the basic knowledge about engineering materials and definitions of their properties. Understanding the principles of proceeding in this field shall result in the skill of independent selection of materials based on the application of appropriate methods. Owing to the gained knowledge students shall obtain a better understanding of interrelationships between the material, its structure, properties and the manufacturing methods having a substantial influence on the durability of engineering structures.
Prerequisites	It is required to achieve effects of education in rudiments of materials science, metals and alloys, ceramics, polymers, and composites modules.

4. Assessment of the learning outcomes of the module			
code	**type**	**description**	**learning outcomes of the module**
IM1A_ZPIDM_w_1	Oral examination	Verification of the knowledge based on the lectures content, recommended literature and attended classes.	IM1A_ZPIDM_1, IM1A_ZPIDM_2
IM1A_ZPIDM_w_2	Written test	Checking the knowledge of principles and methods for engineering materials selection.	IM1A_ZPIDM_2
IM1A_ZPIDM_w_3	Report	Assessment of the skill to select engineering materials with the use of computer software.	IM1A_ZPIDM_2, IM1A_ZPIDM_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**	
IM1A_ZPIDM_fs_1	lecture	The lecture shall enable understanding the principles in force in the process of engineering materials designing and selection. 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.	35	IM1A_ZPIDM_w_1
IM1A_ZPIDM_fs_2	laboratory classes	The application of the gained theoretical knowledge to acquire the skill to use computer techniques in the process of materials selection. Exercises are performed by students individually with the use of teaching laboratories equipment.	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.	60	IM1A_ZPIDM_w_2, IM1A_ZPIDM_w_3