1.	**Field of study**	**Materials Science and Engineering**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2019/2020 (summer term), 2020/2021 (summer term), 2021/2022 (summer term), 2022/2023 (summer term), 2023/2024 (summer term), 2024/2025 (summer term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Module: Solid state physics

Module code: IM2A_FCS

1. Number of the ECTS credits: 4

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
IM2A_FCS_1	Understanding the relationship between material properties and basic laws of nature. Acquiring basic knowledge about theoretical specification of material properties (specific heat, susceptibility etc.). Analysis of various type computational approximations. Acquiring the knowledge about materials electron structure, magnetism, dielectric and other properties.	IM2A_W01 IM2A_W03	5 2
IM2A_FCS_2	Acquiring the skill to resolve theoretical problems from the field of material properties computation. Acquiring the skill to apply specified computational methods and approximations. Analysis of various type approaches to theoretical determination of material properties	IM2A_U09 IM2A_U19	5 3
IM2A_FCS_3	Development of the skill of new knowledge acquisition, problem analysis, concluding based on mathematical equations, acquiring the skill to interpret ideas and concepts.	IM2A_K01 IM2A_K04 IM2A_K05	2 2 1

3. Module description

Description	The module Solid state physics shall enable that students learn a theoretical description of material properties and their relation to basic laws of nature. Listeners should master the scope of knowledge related to materials electron structure, thermal properties, magnetism and magnetic and dielectric properties, transport phenomena and others. A special emphasis will be placed on mastering certain computational techniques, the analysis of used approximations and of obtained results
Prerequisites	The knowledge of mathematics and physics on a university level and of chemistry on a grammar school level is required

4. Assessment of the learning outcomes of the module			
code	**type**	**description**	**learning outcomes of the module**
IM2A_FCS_w_1	Oral examination	Verification of the knowledge based on the lectures content, recommended literature and attended classes	IM2A_FCS_1, IM2A_FCS_2, IM2A_FCS_3
IM2A_FCS_w_2	Written tests	Checking the acquired skills to resolve problems, compute material properties from basic laws of physics	IM2A_FCS_2, IM2A_FCS_3
IM2A_FCS_w_3	Interview	Assessment of understanding the material properties, their interpretation in the context of application in materials engineering	IM2A_FCS_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_FCS _fs_1	lecture	The lecture shall enable understanding basic material properties as resulting from the laws of physics. It illustrates general regularities in the structure of matter in a classical and quantum presentation. The whole is illustrated with multimedia presentations	30	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues	35	IM2A_FCS_w_1
IM2A_FCS _fs_2	practical classes	Independent analysis of physical problems based on the use of various type computational methods.	30	Preparation to classes by self-studying of recommended issues from a handbook and/ or collection of problems	20	IM2A_FCS_w_2