

1.	Field of study	Physics
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2025/2026 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	General information about the module	
Module name		Set of Diploma Courses II: Numerical Modeling of Solids
Module code		W4-FZ-NM-S2-3-22-29
Number of the ECTS credits		3
Language of instruction		English
Purpose and description of the content of education		<p>Predicting of the solid state material properties such as electronic structure (e.g. whether the material is an insulator or conductor), magnetic and elastic properties (e.g. Bulk modulus or the equilibrium lattice constant) obtained from computer calculations based on Density Functional Theory using Plane Waves or Linear Augmented Plane Waves methods. The relation between optical and spectroscopic properties with electronic structure.</p> <p>Lecture ends with an exam, the computer laboratory exercises finishes with reports (depicting the modelled compounds).</p>
List of modules that must be completed before starting this module (if necessary)		not applicable

8.	Learning outcomes of the module			
Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)	
E1	has in-depth knowledge of condensed phase physics	KF_W04	3	
E2	knows the basics of programming in scientific applications and selected numerical algorithms	KF_W07	4	
E3	knows the structure, principle of operation and the scope of application of software for atomistic computer simulations	KF_W08	4	
E4	can write own implementations of selected procedures and functions	KF_U02	4	
E5	is able to independently prepare the study results	KF_U11	4	
E6	can work in a group; is able to define priorities for the implementation of the task	KF_K03	5	
E7	is able to undertake a substantive discussion on the issue	KF_K07	4	

9.	Methods of conducting classes		
Code	Category	Name (description)	
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture <i>a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a</i>	

		<i>passive reception of the information provided</i>
d01	Programmed learning methods	Working with a computer <i>e.g., Webquest; implementation of educational tasks using electronic and digital devices, computer programs and Internet applications; the academic teacher acts as a consultant; students' work is carried out step by step according to the plan laid own by the person teaching the course and following his instructions, and proceeds towards producing the indicated results within the set deadline</i>

10. Forms of teaching					
Code	Name	Number of hours	Assessment of the learning outcomes of the module	Learning outcomes of the module	Methods of conducting classes
FZ1	lecture	10	exam	E1, E2, E3	a01
FZ2	laboratory classes	30	course work	E4, E5, E6, E7	d01

11. The student's work, apart from participation in classes, includes in particular:				
Code	Category	Name (description)		Is it part of the BUNA?
a02	Preparation for classes	Literature reading / analysis of source materials <i>reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class</i>		No
a03	Preparation for classes	Developing practical skills <i>activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)</i>		Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content <i>reading through the syllabus and getting acquainted with its content</i>		No
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class <i>exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class</i>		Yes
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion <i>a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course</i>		Yes
d01	Consulting the results of the verification of learning outcomes	Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes <i>reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes</i>		No

Information on the details of the module implementation in a given academic year can be found in the syllabus available in the USOS system: <https://usosweb.us.edu.pl>.