1.	**Field of study**	**not applicable**
2.	Faculty	not applicable
3.	Academic year of entry	not applicable
4.	Level of qualifications/degree	not applicable
5.	Degree profile	not applicable
6.	Mode of study	not applicable

7.	**General information about the module**
Module name	**Mechanical waves and classical optics**
Module code	KN-F-S2-FMiOK
Number of the ECTS credits	2
Language of instruction	Polish
Purpose and description of the content of education	The aim of the module is to provide knowledge about mechanical waves (including water waves and sound waves) and electromagnetic waves (light waves). Within the module, students will participate in workshops along with demonstrations illustrating the laws and physical principles presented during classes. The aim of the workshop is to familiarize students with issues related to the behavior of mechanical wave and light, including the principles of reflection, refraction, interference, and diffraction, as well as with the research methods used in classical optics. The content covered within the module complies with the current, extended physics curriculum mandated at the high school level. The main objective of the workshop is for students to acquire both theoretical and practical skills in applying optical concepts to describe phenomena occurring in nature – recognizing their presence in the world around us, solving problems using appropriate optical laws and relationships, and planning and conducting observations and laboratory experiments that enable drawing valid conclusions.
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)
OK_01	The student knows the fundamental issues and laws in the field of mechanical and electromagnetic waves, acoustics, geometric and physical optics.	KN_NDP_F_S2_W01 KN_NDP_F_S2_W02	4 3
OK_02	The student understands the key physical phenomena related to the propagation and properties of mechanical and electromagnetic waves and knows the mathematical formalism necessary to describe them.	KN_NDP_F_S2_W01 KN_NDP_F_S2_W02	4 2
OK_03	The student knows and applies the laws of optics and optical phenomena to formulate a physical problem and find its solution.	KN_NDP_F_S2_W01 KN_NDP_F_S2_W02	3 3
OK_04	Student can point out examples of the application of learned laws of optics in everyday life and the interdisciplinary nature of physics as a science.	KN_NDP_F_S2_U01	3
OK_05	Student can explain the importance of experiments for the development of physical sciences.	KN_NDP_F_S2_U01	3

		KN_NDP_F_S2_U04	2
OK_06	The student can obtain information from literature, databases and other sources to deepen his understanding of the laws of physics.	KN_NDP_F_S2_U07	3

9. Methods of conducting classes

Code	Category	Name (description)
b01	Problem-solving methods	Problem-based lecture *an analysis of a selected scientific or practical problem accompanied by its assessment and an attempt to provide a solution to the issues presented in the lecture as well as the indication of the consequences of the proposed solution*
b02	Problem-solving methods	Lecture-discussion *transmission of content involving interaction with the lecture audience; discussion of lecture-related issues is one of its elements or constitutes its follow-up*
b04	Problem-solving methods	Activating method – discussion / debate *an exchange of views supported by substantive arguments leading to a clash of different views, a compromise or the identification of common positions; it proceeds according to previously agreed-upon rules regarding the time, manner and turn-taking as well as the principles of civil discourse; a discussion is not a competition but aims at finding the best solutions or presenting different points of view; its varieties include brainstorming, Oxford-style debate, panel discussion, decision tree, conference discussion; a debate is an orderly dispute between supporters and opponents of a viewpoint, usually specialists in the field or pre-selected representatives of a group dealing with a common problem*
b07	Problem-solving methods	Activating methods: a case study *a comprehensive description of a phenomenon connected with the selected discipline; reflecting the reality, presenting the 'what', 'where' and 'how' of the phenomenon, i.e., all of its key aspects to be discussed in class; used as a reproduction, presentation, discussion or diagnosis of factors that shape the phenomenon or interact with it; an in-depth qualitative analysis and evaluation of a selected phenomenon*
c06	Demonstration methods	Demonstration-imitation *a presentation of a model way of performing specific activities accompanied by a commentary; it aims at triggering imitation activities in an individual or in a group of participants observing the activities of the person teaching the course until the right habit is formed through regular exercise; the demonstration-imitation method is combined with a physical practice of activities/behaviours*
c07	Demonstration methods	Screen presentation *a presentation of synthetic image content using computer graphics, e.g., a series of slides or other multimedia forms, usually accompanied by a commentary; typical components of a screen presentation include text organized into bulleted points, charts, images and animations, sometimes sound effects or music; a multimedia illustration of course content presented in the form of a projected image*
d03	Programmed learning methods	Working with another teaching tool *e.g. using websites in any way or according to the rules set by the teacher; or making use of other subject-specific tools*

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**
01	workshop	30	course work	OK_01, OK_02, OK_03, OK_04, OK_05, OK_06	b01, b02, b04, b07, c06, c07, d03

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 *reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class*	Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	No
b02	Consulting the curriculum and the organization of classes	Verification / adjustment / discussion of syllabus provisions *consulting the content of the syllabus, possibly in the presence of the year tutor or members of the class group, and, if necessary, reassessing the provisions concerning special conditions for class participation, e.g., space and time requirements, technical and other requirements, including conditions for participation in classes outside the walls of the university, classes organized in blocks, organized online, etc.*	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class *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*	No
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *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*	Yes

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.