

**1.1 Description of expected learning outcomes** with the assignment of the field of study to the fields of science and scientific disciplines or the fields of art and artistic disciplines to which the learning outcomes for this field apply.

Symbol	Learning outcomes for the course of study Physics. After completing graduate studies in Physics graduate:	Reference of learning outcomes in education in science
<b>KNOWLEDGE</b>		
K2A_W01	Has extended knowledge of the physical sciences, including their historical development, both in terms of methodology, research, and the relevance of physics to the progress of science, learning about the world and of human development.	P7S_WG-O1.1 P7S_WG-O1.2A P7S_WK-O2.1
K2A_W02	Mastered mathematics on the level necessary for quantitative description, understanding and modeling problems with a medium level of complexity. Understands the role of physical theories and accompanying mathematical structures related to the physical world.	P7S_WG-O1.1
K2A_W03	Knows experimental and observational techniques together with their limitations.	P7S_WG-O1.1
K2A_W04	Knows theoretical foundations for the functioning of scientific equipment in the fields of science and scientific disciplines relevant to the physical sciences	P7S_WG-O1.1
K2A_W05	Knows theoretical foundations of computational methods and computer techniques used to solve common problems in the field of physical sciences and understands their limitations.	P7S_WG-O1.1
K2A_W06	Possesses general understanding of current developments and the latest discoveries in the field of physical sciences	P7S_WG-O1.2A
K2A_W07	Knows the rules of health and safety sufficiently to independently work in the profession of physicist.	P7S_WG-O2.2
K2A_W08	Has basic knowledge of legal and ethical issues of scientific and educational activities	P7S_WG-O2.2
K2A_W09	Knows and understands basic concepts and principles of the protection of industrial property and copyright law, and the need for management of intellectual property.	P7S_WG-O2.2
K2A_W10	Knows general principles for the creation and development of forms of individual entrepreneurship, using knowledge	P7S_WG-O2.3

	from the domain of science and scientific disciplines relevant to the physical sciences	
	<b>SKILLS</b>	
K2A_U01	Can independently provide basic theorems and laws of physics together with reasoning leading to them. Can adapt his presentation to the recipient and his level of knowledge.	P7S_UW-03.1 P7S_UK-04.1
K2A_U02	Can plan and perform basic experiments or observations concerning physical problems.	P7S_UW-03.1 P7S_UO-05.1 P7S_UO-05.2
K2A_U03	Basing on empirical data can build simple mathematical models appropriate for the considered physical problems.	P7S_UW-03.1 P7S_UW-03.3A
K2A_U04	Can critically evaluate the results of experiments, observations and theoretical considerations, including discussion of measurement errors.	P7S_UW-03.1 P7S_UW-03.3A P7S_UO-05.2
K2A_U05	Can use at least one software package dedicated to statistical analysis of the data to analyze experimental data	P7S_UW-03.1 P7S_UW-03.3A
K2A_U06	Can use at least one software package dedicated to symbolic computation to analyze simple physical models	P7S_UW-03.1 P7S_UW-03.3A
K2A_U07	Can understand the problems of areas of knowledge common to the physical sciences and the sciences related to them such as chemistry or biology.	P7S_UW-03.1
K2A_U08	Can understand the physical theories that are at the initial stage of development.	P7S_UW-03.1
K2A_U09	Is able to properly estimate the level of own knowledge and determine the directions of further learning in the process of self-education	P7S_UU-06
K2A_U10	Can independently acquire knowledge and develop skills using a variety of sources (in Polish and foreign languages), and modern technology	P7S_UU-06
K2A_U11	Can get in touch with experts in their field, for example understands their lectures for young physicists.	P7S_UK-04.1 P7S_UK-04.2 P7S_UO-05.2
K2A_U12	Can prepare a written work in Polish and foreign language typical for theoretical as well as experimental physics.	P7S_UK-04.3
K2A_U13	Has the ability to prepare oral presentations, in Polish and foreign language typical for theoretical as well as experimental physics.	P7S_UK-04.1 P7S_UK-04.2 P7S_UK-04.3
K2A_U14	Has language skills in the physical sciences in accordance with the requirements for the level B2 of the Common European Framework of Reference for Languages	P7S_UK-04.2 P7S_UK-04.3
	<b>SOCIAL COMPETENCE</b>	

K2A_K01	Understands the need for learning throughout all life, can inspire and organize the learning of others.	P7S_KK-O7.1 P7S_KK-O7.2
K2A_K02	Understands the role of popularization of knowledge, both in the active and passive manner	P7S_KO-O8.1 P7S_KO-O8.2
K2A_K03	Is able to work effectively in a group taking different roles according to the situation.	P7S_KK-O7.2 P7S_KR-O9
K2A_K04	Is familiar with the labor market for the graduate in physics	P7S_KO-O8.3
K2A_K05	It is aware of the social consequences of research typical for physics	P7S_KK-O7.1 P7S_KO-O8.1 P7S_KR-O9
K2A_K06	Is able to think and act in an entrepreneurial way	P7S_KO-O8.3