



**Uchwała nr 1545  
Senatu Uniwersytetu w Białymstoku  
z dnia 26 marca 2014 r.**

***w sprawie określenia efektów kształcenia dla kierunków studiów  
prowadzonych w językach obcych w Uniwersytecie w Białymstoku***

Na podstawie art. 11 ustawy z dnia 27 lipca 2005 r. Prawo o szkolnictwie wyższym (t.j. Dz. U. z 2012 r., poz. 572, z późn. zm.) w związku z rozporządzeniem Ministra Nauki i Szkolnictwa Wyższego z dnia 2 listopada 2011 r. w sprawie *Krajowych Ram Kwalifikacji dla Szkolnictwa Wyższego* (Dz. U. Nr 253, poz. 1520), uchwała się, co następuje:

**§ 1**

Senat określa efekty kształcenia dla niżej wymienionych kierunków studiów, prowadzonych w Uniwersytecie w Białymstoku w językach obcych:

Załącznik nr 1 – fizyka, na poziomie studiów pierwszego stopnia o profilu praktycznym – język angielski;

Załącznik nr 2 – pedagogika, na poziomie studiów pierwszego stopnia o profilu ogólnoakademickim – język angielski.

**§ 2**

Uchwała wchodzi w życie z dniem podpisania.

***Przewodniczący  
Senatu Uniwersytetu w Białymstoku***

***Prof. dr hab. Leonard Etel***

**LEARNING OUTCOMES**  
**Field of study: Physics**  
**first degree study programme – practical education**

**Field of study in the area of education**

The field of study Physics falls within an area of education referring to science described in National Qualification Frameworks in the European Higher Education Area, stated in the regulations issued pursuant to the art. 9 sec. 1 point 2 of the Act of 27 July 2005 – Law on Higher Education ( Journal of Laws No. 164, item 1365 as amended). The field of study belongs to the area of physical sciences with elements applied in medical sciences.

**Explanation of the symbols used:**

- K (before bottom hyphen) – learning outcomes for the field of study
- W – category of knowledge
- U – category of skills
- K (after bottom hyphen) – social competences category
- X1P – learning outcomes in the field of education in science for first degree study programme
- 01, 02, 03 and subsequent – number of a learning outcome

Symbol	DESCRIPTION OF LEARNING OUTCOMES FOR THE FIELD OF STUDY	Reference to learning outcomes in the area of education in the field of science
<b>Following the completion of the first degree studies in <i>Physics</i> a graduate:</b>		
<b>KNOWLEDGE</b>		
<b>with reference to physics and methodology of physical sciences</b>		
K_W01	understands fundamental meaning of physics in technological, economic and civilization development as well as its significance for health care	X1P_W01
K_W02	understands the role of a quantitative model of a physical object and physical phenomenon within the framework of basic areas of physics	X1P_W03
K_W03	becomes aware of the importance of an experiment as a verification means of theoretical concepts as well as experimental uncertainty	X1P_W01
K_W04	understands the structure of physics as a scientific discipline, becomes aware of connections between certain domains and theory, knows examples of faulty physical hypotheses and faulty physical theories	X1P_W01
K_W05	knows limitations of applications of chosen physical theories, models of physical objects and descriptions of physical phenomena	X1P_W01
<b>with reference to tools of mathematics</b>		
K_W06	has mathematical knowledge, including differential and integral calculus, algebra as well as probability theory and statistics necessary to describe laws of physics, to model and to study selected physical systems and to analyse experimental data	X1P_W02
K_W07	understands the formal structure of basic physical theories, can use proper mathematical tools for quantitative description of phenomena from chosen areas of physics	X1P_W02 X1P_W03

<b>with reference to foundations of physics</b>		
K_W08	has knowledge within the framework of basic concepts and formalism of <b>classical mechanics</b> , laws of mechanics and theoretical models of chosen mechanical systems, understands fundamental character of Newton's laws	X1P_W01 X1P_W03
K_W09	knows ways of experimental verification of physical laws and concepts, knows construction and operation rules of measuring apparatus for selected experiments regarding mechanics	X1P_W05
K_W10	knows and understands basic concepts and selected phenomena regarding <b>electricity and magnetism</b> – understands contents of Maxwell field equations	X1P_W01 X1P_W03
K_W11	knows ways of experimental verification of physical laws and concepts, knows construction and operation rules of measuring apparatus for selected experiments regarding electricity and magnetism	X1P_W05
K_W12	has knowledge about basic concepts, phenomena and formalism of thermodynamics, laws of thermodynamics as well as theoretical models of chosen thermodynamic systems	X1P_W01 X1P_W03
K_W13	knows construction and operation rules of measuring apparatus for selected experiments regarding thermodynamics	X1P_W05
K_W14	has knowledge about basic concepts and formalism of <b>optics and physics of electromagnetic wave phenomena</b> and theoretical models of selected optical and wave systems, knows and understands limitations of their applications	X1P_W01 X1P_W03
K_W15	knows ways of experimental verification of physical laws and concepts, knows construction and operation rules of measuring apparatus for selected experiments regarding optics and physics of electromagnetic wave phenomena	X1P_W05
K_W16	has basic knowledge regarding <b>atomic physics, molecule, solid-state physics, physics of atomic nuclei, elementary particles and basic interactions in nature</b>	X1P_W01 X1P_W03
K_W17	knows ways of experimental verification of physical laws and concepts, knows construction and operation rules of measuring apparatus for selected experiments regarding physics of microcosm	X1P_W05
K_W18	has basic knowledge about astronomy and knows the rules of astronomical observations	X1P_W01 X1P_W03
<b>with reference to elements of theoretical physics</b>		
K_W19	has basic knowledge about <b>theory of electromagnetic radiation</b> , knows theoretical approach to selected problems regarding the theory of radiation and chosen mathematical tools for their analysis	X1P_W01 X1P_W02 X1P_W03
K_W20	has knowledge about foundations of <b>quantum mechanics</b> , formalism and probabilistic interpretation of the theory, knows a theoretical description as well as mathematical tools for analysis of chosen quantum systems	X1P_W01 X1P_W02 X1P_W03
<b>with reference to applications of physics in medicine</b>		
K_W21	has basic knowledge in the range of biology, chemistry, biophysics and medicine necessary to understand applications of physics in medicine	X1P_W01 X1P_W05
K_W22	has basic knowledge in the range of chosen applications of physics in medicine	X1P_W01
K_W23	knows construction and operation rules of selected diagnostic and medical treatment devices	X1P_W05
K_W24	knows fundamental rules of Occupational Safety and Health in diagnostic and medical treatment laboratories with particular consideration of radiation protection	X1P_W06
K_W25	has basic knowledge referring to legal and ethical issues connected with practical applications of physics in health care	X1P_W07
<b>with reference to tools of information technology</b>		



K_W26	knows the rules of operating systems usage and the package of selected specialist application software, including environments for data analysis and symbolic computation	X1P_W04
K_W27	has basic knowledge about algorithmics and data structures	X1P_W04 X1P_W02
K_W28	knows foundations of programming in a chosen high-level programming language	X1P_W04
K_W29	knows foundations of numerical methods used in issues of physics and its applications	X1P_W04
<b>with reference to technical applications of physics</b>		
K_W30	knows construction and understands physical foundations of operations of selected analogue and digital electronic subassemblies	X1P_W01 X1P_W05
K_W31	knows construction of selected electronic devices with consideration of applications in medical equipment and understands the rules of its operation	X1P_W01 X1P_W05
<b>moreover</b>		
K_W32	knows basic rules of intellectual and industrial property protection	X1P_W08
K_W33	knows the rules of individual entrepreneurship and commercialization of used research results	X1P_W09
<b>SKILLS</b>		
<b>with reference to structures of physics and methodology of physical sciences</b>		
K_U01	can intelligibly present basic facts regarding known areas of physics, outline the structure of physics as a scientific discipline and show the impact of selected discoveries in the field of physics on development of technology, economy and civilization	X1P_U06 X1P_U09
K_U02	is able to prepare a study, including the one addressed to wide public, regarding research in the scope of known areas of physics, using acquired knowledge as well as literature and information technology resources	X1P_U05 X1P_U06 X1P_U08
<b>with reference to tools of mathematics</b>		
K_U03	can use known tools of mathematics to formulate and solve chosen problems within the framework of theoretical and experimental physics	X1P_U01 X1P_U02
K_U04	is able to independently complete and broaden mathematical knowledge	X1P_U07
K_U05	can use computer tools for symbolic computation	X1P_U04
<b>with reference to foundations of physics</b>		
K_U06	can analyse problems in the scope of mechanics, find and present their solutions on the basis of acquired knowledge and using known tools of mathematics run quantitative analysis and draw qualitative conclusions	X1P_U01 X1P_U02
K_U07	can plan and do simple experiments referring to mechanics, critically analyse their results and present them	X1P_U03
K_U08	can analyse problems regarding electricity and magnetism, find and present their solutions on the basis of acquired knowledge and using known tools of mathematics run quantitative analysis and draw qualitative conclusions	X1P_U01 X1P_U02
K_U09	can plan and do simple experiments referring to electricity and magnetism, critically analyse their results and present them	X1P_U03
K_U10	can analyse problems regarding thermodynamics, find and present their solutions on the basis of acquired knowledge and using known tools of mathematics run quantitative analysis and draw qualitative conclusions	X1P_U01 X1P_U02
K_U11	can plan and do simple experiments referring to thermodynamics, critically analyse their results and present them	X1P_U03
K_U12	can analyse problems regarding optics and physics of wave phenomena, find and present their solutions on the basis of acquired knowledge and using known tools of mathematics run quantitative analysis and draw qualitative conclusions	X1P_U01 X1P_U02



K_U13	can plan and do simple experiments referring to optics and physics of wave phenomena, critically analyse their results and present them	X1P_U03
K_U14	can analyse problems regarding microscopic structure of matter, find and present their solutions on the basis of acquired knowledge and using known tools of mathematics run quantitative analysis and draw qualitative conclusions	X1P_U01 X1P_U02
K_U15	can plan and do simple experiments referring to the physics of microcosm, critically analyse their results and present them	X1P_U03
K_U16	can clearly present basic problems referring to astronomy and astrophysics, make basic astronomical observations and interpret their results	X1P_U01 X1P_U02
K_U17	can critically and with understanding use literature and information technology resources with reference to foundations of physics	X1P_U07
<b>with reference to elements of theoretical physics</b>		
K_U18	can present theoretical formulation of chosen issues of electromagnetic radiation physics and run theoretical analysis of selected phenomena using suitable mathematical tools	X1P_U01 X1P_U02
K_U19	can present theoretical formulation of chosen issues of quantum mechanics, and run theoretical analysis of selected quantum systems using suitable mathematical tools	X1P_U01 X1P_U02
K_U20	can critically and with understanding use literature and information technology resources with reference to issues of theoretical physics	X1P_U07
<b>with reference to applications of physics in medicine</b>		
K_U21	can analyse chosen problems referring to applications of physics in medicine on the basis of knowledge of physics as well as biology, chemistry and medicine	X1P_U01 X1P_U02
K_U22	can communicate with medical staff with reference to chosen methods of diagnostics and medical treatment with particular consideration of oncology	X1P_U06 X1P_K02 X1P_K03
K_U23	can present operation rules as well as identify and assess dangers connected with the use of selected diagnostic and medical treatment devices	X1P_U01 X1P_W06
K_U24	can plan and take simple measurements connected with the use of selected diagnostic and medical treatment devices, including dosimetric measurements	X1P_U03
K_U25	can analyse a chosen problem referring to medical physics on the basis of the internet and literature resources and present a way of its solution in the form of a concise study	X1P_U05
<b>with reference to tools of information technology</b>		
K_U26	can work in the environment of different operating systems and use selected application software	X1P_U04
K_U27	can write a simple computer programme in a chosen programming language, make it complex and start it	X1P_U04
K_U28	can use computer programmes for data analysis as well as symbolic and numerical calculations	X1P_U04
K_U29	is able to find and use specialist computer software in the internet resources with respect for intellectual property and rules of use	X1P_U07 X1P_K04
<b>with reference to technical applications of physics</b>		
K_U30	can plan and do simple experiments referring to electronics, critically analyse their results and present them	X1P_U03
K_U31	can critically and with understanding use literature and the internet resources with reference to issues of electronics	X1P_U07
<b>moreover</b>		
K_U32	has foreign language skills at the upper-intermediate level	X1P_U10
K_U33	can use diverse sources of knowledge with reference to physical sciences and their applications	X1P_U10

### SOCIAL COMPETENCES

K_K01	knows the limitations of their knowledge and understands the need of further learning, raising professional, personal and social skills	X1P_K01 X1P_K05
K_K02	can work in a team performing various roles, especially a leadership role, can take responsibility for realization of a group task	X1P_K02 X1P_K03
K_K03	understands the meaning of intellectual honesty in their own actions and actions of other people	X1P_K04 X1P_W07 X1P_W08
K_K04	understands the need to share knowledge, including the need of widespread presentation of achievements of physics	X1P_K06
K_K05	can independently find information in literature and the internet resources, also in foreign languages	X1P_K01 X1P_K05
K_K06	can express opinions about fundamental issues of physics and its applications, understands social aspects of medical applications of physics and responsibility connected with it	X1P_K06
K_K07	can think and act in an entrepreneurial manner	X1P_K07



## LEARNING OUTCOMES

### Field of study: Pedagogy

### first degree study programme – general academic education

#### Field of study in the area of education

Field of study - pedagogy belongs to the fields of education in humanities and social sciences. The subject area of pedagogical studies comprises both the ideas (ideals, norms, obligations) as well as social practices. Pedagogy as a science of teaching and education combines two perspectives: humanistic, focusing on the essence of education, teaching and learning, and social, concerning educational environments, systems of educational and care institutions, their function and significance in human development. Pedagogy deals with understanding how people develop and learn throughout life as well as a critical analysis of the essence of knowledge and understanding the dimensions of individual and social consequences. Pedagogy includes the analyses of educational processes, systems and approaches and their cultural, social, political, historical and economic contexts.

#### Explanation of the symbols used:

**K** (before bottom hyphen) – learning outcomes for the field of study

**W** – category of knowledge

**U** – category of skills

**K** (after bottom hyphen) – social competences category

**H1A** – learning outcomes in the field of education in humanities for first degree study programme

**S1A** – learning outcomes in the field of education in social sciences for first degree study programme

**01, 02, 03** and subsequent – number of a learning outcome

Symbol	DESCRIPTION OF LEARNING OUTCOMES FOR THE FIELD OF STUDY  Following the completion of the first degree studies in <i>Pedagogy</i> a graduate:	Reference to learning outcomes in the area of education in the field of humanities and social sciences
<b>KNOWLEDGE</b>		
K_W01	is familiar with elementary terminology used in pedagogy and understands its sources and application within the related scientific disciplines	H1A_W02 H1A_W03
K_W02	has elementary knowledge of the place of pedagogy in the system of science and its objective and methodological relations with other scientific disciplines	H1A_W05 H1A_W03
K_W03	has well-structured knowledge of education and training, its philosophical, socio-cultural, historical, biological, psychological and medical grounds	H1A_W05
K_W04	knows selected concepts of man: philosophical, psychological and social constituting the theoretical basis for pedagogical activities	H1A_W05 S1A_W05
K_W05	has basic knowledge about human development in the life cycle, both in biological as well as psychological and social terms	H1A_W04 H1A_W05
K_W06	has basic knowledge about types of social ties and regularities that govern them	S1A_W04

K_W07	has elementary knowledge about different types of social structures and institutions of social life, and relations between them	S1A_W02 S1A_W03
K_W08	has elementary knowledge about the processes of interpersonal and social communication, their accuracy and interferences	S1A_W05 S1A_W09
K_W09	knows basic theories of education, learning and teaching, understands various factors of these processes	H1A_W04
K_W10	has basic, well-structured knowledge about different educational environments, their specifics and the processes taking place in them	S1A_W03 S1A_W08 S1A_W02
K_W11	knows the most important traditional and contemporary trends and pedagogical systems, understands their historical and cultural conditions	H1A_W06
K_W12	has elementary knowledge about designing and conducting research in pedagogy, in particular about research problems, methods, techniques and research tools; knows basic paradigmatic traditions of social studies that individual methods derive from	S1A_W06
K_W13	has elementary, well-structured knowledge on different sub-disciplines of pedagogy, including terminology, theory and methodology	H1A_W04
K_W14	has basic knowledge of the structure and functions of the education system; purposes, legal basis, organization and functioning of various educational institutions, therapeutic, cultural and aid-providing	S1A_W09
K_W15	has basic knowledge of the participants of educational, care, cultural and aid-providing activities	S1A_W04
K_W16	has elementary knowledge of methodology to perform common tasks, standards, or procedures used in various areas of pedagogical activities	H1A_W04
K_W17	has elementary knowledge of health and safety in educational, care, cultural and aid-providing institutions	
K_W18	has basic knowledge on how to design his/her own path of development	
K_W19	has well-structured knowledge about ethical principles and norms	S1A_W07
<b>SKILLS</b>		
K_U01	is able to make observations and interpretations of social phenomena; analyses their relationship with different areas of pedagogical activities	S1A_U01 S1A_U08
K_U02	is able to use basic theoretical knowledge of pedagogy and related disciplines to analyze and interpret educational, care, cultural and aid-providing problems as well as themes and patterns of human behavior	S1A_U02 S1A_U01 S1A_U06 H1A_U04
K_U03	is able to use basic theories in order to analyze the motives and patterns of human behavior, diagnosing and forecasting the situation, and analyze strategies of practical actions in relation to different contexts of pedagogical activities	H1A_U04 H1A_U06 S1A_U03 S1A_U08
K_U04	can independently acquire knowledge and develop his/her professional skills using various sources (in native language and foreign) and modern technology (ICT)	H1A_U01 H1A_U03 H1A_U10
K_U05	has elementary research skills enabling to analyze the examples of research and construct and carry out simple pedagogical research; is able to draw conclusions, develop and present the results (using ICT) and indicate directions for further research	H1A_U02 H1A_U04 S1A_U01 S1A_U02
K_U06	is able to express opinions in a precise and consistent way in speech and writing on topics concerning selected pedagogical issues using different theoretical approaches and the achievements of both pedagogy and other disciplines	H1A_U01 H1A_U06 H1A_U11 H1A_U12
K_U07	has developed skills in the field of interpersonal communication, can use specialized language and communicate in a precise and consistent way using different communication channels and techniques with experts in the field of pedagogy as well as recipients outside the group of specialists	H1A_U07