



**Uchwała nr 2205**  
**Senatu Uniwersytetu w Białymstoku**  
**z dnia 28 lutego 2018 r.**

***w sprawie określenia efektów kształcenia dla kierunku informatyka,  
studia drugiego stopnia o profilu ogólnoakademickim,  
prowadzonego w języku angielskim***

Na podstawie art. 11 ustawy z dnia 27 lipca 2005 r. *Prawo o szkolnictwie wyższym* (t. j. Dz. U. z 2017 r., poz. 2183 z późn. zm.) uchwała się, co następuje:

§ 1

Senat określa efekty kształcenia dla kierunku informatyka, studia drugiego stopnia o profilu ogólnoakademickim, prowadzonego w języku angielskim. Opis efektów kształcenia stanowi Załącznik do niniejszej Uchwały.

§ 2

Uchwała wchodzi w życie z dniem podjęcia.

***Przewodniczący***  
***Senatu Uniwersytetu w Białymstoku***

***Prof. dr hab. Robert W. Ciborowski***

**LEARNING OUTCOMES**  
**Field of study: Computer Science**  
**Second degree study programme - general academic education**

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

Computer Science programme falls within two areas of education: science and technical sciences. It is directly connected with areas of knowledge to which belongs computer science as a discipline (area of science, field of mathematical sciences, area of technical sciences, field of technical sciences).

**Explanation of the symbols used:**

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

**W** – category of knowledge

**U** – category of skills

**K** (after underscore) – social competences category

**T2A** – learning outcomes in the field of education in technical sciences for second degree study programme

**X2A** – learning outcomes in the field of education in science for second degree study programme

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

Symbol	<b>DESCRIPTION OF LEARNING OUTCOMES FOR THE FIELD OF STUDY</b>  <b>Following the completion of the second degree studies in <i>Computer Science</i> a graduate:</b>	<b>Reference to learning outcomes in the area of education in the field of technical sciences and science</b>
<b>KNOWLEDGE</b>		
K_W01	has a well-rounded general knowledge of a foreign language, including terminology specific to computer science; has a thorough knowledge of vocabulary and grammatical structures that enable expressing ideas, in written and oral form, on general topics and topics related to computer science	X2A_W01 X2A_W06 T2A_W02
K_W02	has an in-depth knowledge of: 1. terminology appropriate for the selected computer science specialization 2. creation of publications on the basis of the obtained research results	X2A_W01 X2A_W06 T2A_W03
K_W03	has broadened and deep knowledge in the field of analyzing advanced algorithms and data structures	X2A_W01 X2A_W02 X2A_W03 T2A_W03

		T2A_W07
K_W04	has basic knowledge of analytical and algebraic methods in computer science applications	X2A_W02 X2A_W03 T2A_W01 T2A_W02
K_W05	has basic knowledge of modeling and analysis of computer science systems architecture, as well as modeling and analysis of their quality	X2A_W02 X2A_W03 X2A_W05 T2A_W04 T2A_W06 T2A_W07
K_W06	has basic knowledge of modeling and simulation with models of imprecision or uncertainty and the practical application of these models	X2A_W02 X2A_W03 X2A_W04 T2A_W04 T2A_W07
K_W07	has organized and deepened theoretical knowledge of the design and programming of relational databases	X2A_W01 X2A_W03 X2A_W05 T2A_W03 T2A_W07
K_W08	has basic knowledge of modern expert systems and their applications	X2A_W03 T2A_W04 T2A_W07
K_W09	has in-depth and structured knowledge of security of digital data and information systems, including in the context of the functioning of computer networks	X2A_W01 X2A_W03 X2A_W05 T2A_W03 T2A_W07
K_W10	has basic knowledge about directing and managing teams implementing IT projects	X2A_W08 X2A_W09 X2A_W10 T2A_W02 T2A_W09
K_W11	has basic knowledge of algorithms for massive parallel computations with the use of modern numerical methods and their implementation on multiprocessor and multi-core systems and graphic cards	X2A_W03 X2A_W04 X2A_W05 T2A_W04 T2A_W07
K_W12	has well-rounded theoretical knowledge of techniques and technologies appropriate for the field of computer science	X2A_W03 X2A_W04 T2A_W04
K_W13	has well-rounded theoretical knowledge of information technologies used in various fields	X2A_W03 X2A_W04 T2A_W02 T2A_W04
K_W14	has structured theoretical knowledge of the design methods and programming of applications used in various fields	X2A_W03 X2A_W04 T2A_W02 T2A_W04

K_W15	has knowledge of development trends and new achievements in computer science	X2A_W06 T2A_W05
<b>SKILLS</b>		
K_U01	can obtain information from various sources (literature, websites, databases, etc.), integrate them, interpret them and critically evaluate them, draw conclusions and formulate and fully justify opinions	X2A_U03 X2A_U04 T2A_U01 T2A_U02 T2A_U12
K_U02	is able to develop detailed documentation of a project or research task, results of an experiment, can prepare a study discussing these results	X2A_U02 X2A_U04 X2A_U06 X2A_U07 T2A_U02 T2A_U03 T2A_U05
K_U03	can prepare and deliver a presentation about a project task, research project or a chosen computer science subject, can discuss ideas about this presentation	X2A_U03 X2A_U05 X2A_U06 X2A_U07 X2A_U08 X2A_U09 T2A_U02 T2A_U04 T2A_U05 T2A_U12
K_U04	can use a foreign language sufficiently to read and understand professional literature and communication, including professional topics, as well as to prepare and deliver a presentation on the implementation of a project or research task	X2A_U03 X2A_U04 X2A_U05 X2A_U06 X2A_U08 X2A_U09 X2A_U10 T2A_U01 T2A_U02 T2A_U03 T2A_U04 T2A_U06
K_U05	is able to construct models in a selected area of computer science and use their implementation in the development environment, is able to analyze the characteristics of computer science systems	X2A_U01 X2A_U02 X2A_U04 T2A_U08 T2A_U10 T2A_U15 T2A_U17 T2A_U19
K_U06	can apply basic models of imprecision or uncertainty and can model practical issues with the use of these models	X2A_U01 X2A_U02 X2A_U04

		T2A_U08
K_U07	can implement advanced dynamic data structures and advanced algorithms	X2A_U01 X2A_U04 T2A_U08 T2A_U17
K_U08	can implement the known methods of algebra and analysis and make appropriate modifications depending on the applications	X2A_U01 X2A_U02 X2A_U04 T2A_U09
K_U09	can design and implement databases using extensions of the SQL language	X2A_U01 X2A_U04 T2A_U08
K_U10	can design and implement an expert system that solves specific problems	X2A_U01 X2A_U02 X2A_U03 X2A_U04 T2A_U08
K_U11	can use models and security classes of information systems, as well as methods of user identification and authentication	X2A_U01 X2A_U04 T2A_U12 T2A_U15 T2A_U16 T2A_U18
K_U12	can develop IT projects, design documentation, and can manage an IT team	X2A_U02 X2A_U04 T2A_U12 T2A_U14
K_U13	can implement massive parallel processing algorithms, including ones in the graphics card environment	X2A_U04 T2A_U08 T2A_U09
K_U14	can use mathematical methods and models, and adapt them as needed for the analysis and design of applications	X2A_U01 X2A_U04 T2A_U08 T2A_U15
K_U15	can evaluate and compare design solutions and the application programming process using different information technologies, according to given utility or economic criteria	X2A_U02 T2A_U12 T2A_U14 T2A_U15
K_U16	can design and implement software for selected computer science applications	X2A_U01 X2A_U04 T2A_U08
K_U17	can use software suitable for selected computer science applications	X2A_U01 X2A_U04 T2A_U18
K_U18	can configure devices suitable for selected computer science applications	X2A_U01 X2A_U04 T2A_U18
K_U19	can propose improvements to existing algorithms and applications used in various fields	X2A_U04 T2A_U16

K_U20	can assess the usefulness and the possibility of using new achievements in the field of computer science	X2A_U04 T2A_U12
<b>SOCIAL COMPETENCES</b>		
K_K01	can act and think in a creative and innovative way	X2A_K06 X2A_K07 T2A_K06
K_K02	is able to collaborate in a team implementing joint projects	X2A_K02 T2A_K03
K_K03	understands the need for continuous training and self-education	X2A_K01 X2A_K05 T2A_K01
K_K04	carefully determines the priorities and order of activities	X2A_K03 X2A_K04 T2A_K04 T2A_K05
K_K05	understands the need for systematic familiarization with the latest trends in the development of information technology through scientific and popular science magazines and websites	X2A_K01 X2A_K05 T2A_K01 T2A_K07