

Learning outcomes of the programme:

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| 1. | Field of study | Physics |
| 2. | Academic year of entry | 2017/2018 (winter term), 2018/2019 (winter term) |
| 3. | Level of qualifications/degree | first-cycle studies |
| 4. | Degree profile | general academic |

| Code of the learning outcome of the programme | Learning outcomes The graduate: | Codes of the learning outcomes of the areas of education to which the learning outcome of the programme is related |
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| KNOWLEDGE | | |
| KF_W01 | understands the civilisational importance of physics and its applications | X1A_W01 |
| KF_W02 | knows the basic concepts and theorems from selected branches of higher mathematics; has knowledge of computational techniques | X1A_W01, X1A_W02, X1A_W04 |
| KF_W03 | knows the basic laws and formulas of selected branches of physics and astronomy | X1A_W01, X1A_W03 |
| KF_W04 | has a basic knowledge of the various branches of classical physics, including mechanics, electricity and magnetism, optics and structure of the matter, thermodynamics with elements of statistical physics | X1A_W01, X1A_W03 |
| KF_W05 | has a basic knowledge of classical, relativistic and quantum mechanics as well as electrodynamics | X1A_W01, X1A_W03, X1A_W04 |
| KF_W06 | knows basic issues from atomic and molecular physics, condensed phase physics, nuclear physics, particle physics and astrophysics | X1A_W01, X1A_W03, X1A_W05 |
| KF_W07 | knows and understands the basic physical theories and processes | X1A_W01, X1A_W03 |
| KF_W08 | knows mathematical formalism useful in constructing and analysing physical models and understands its limitations | X1A_W01, X1A_W02, X1A_W03, X1A_W04 |
| KF_W09 | knows the basics of statistics and data analysis | X1A_W02, X1A_W04 |
| KF_W10 | knows the basics of computational and programming techniques supporting the work of a physicist and understands their limitations | X1A_W04 |
| KF_W11 | has a basic knowledge of electronics, can read schematic diagrams, knows the physical basis and the principle of functioning of individual electronic components and simple systems | X1A_W01, X1A_W05 |
| KF_W12 | knows the construction and the principle of functioning of basic measurement devices and scientific equipment | X1A_W01, X1A_W05 |
| KF_W13 | knows and understands legal, economic and ethical aspects of scientific activity | X1A_W07 |
| KF_W14 | knows and understands basic concepts and principles of intellectual property and copyright protection | X1A_W08 |
| KF_W15 | has a basic knowledge of the formation and development of forms of individual entrepreneurship | X1A_W09 |
| KF_W16 | knows the basic principles of occupational health and safety | X1A_W06 |
| KF_W17 | has a general knowledge of the selected scientific methods and knows the issues characteristic of the discipline of science not related to the programme | |
| SKILLS | | |
| KF_U01 | is able to clearly present basic physical theories and theorems in speech and writing | X1A_U06, X1A_U08, X1A_U09 |
| KF_U02 | is able to use a mathematical apparatus to solve simple physical problems | X1A_U01, X1A_U02 |
| KF_U03 | is able to explain basic physical processes occurring in the surrounding world based on the laws of physics | X1A_U01 |
| KF_U04 | is able to explain the functioning of basic mechanical, electrical and electronic devices based on the laws of physics | X1A_U01 |
| KF_U05 | can perform various types of physical measurements and experiments | X1A_U03 |
| KF_U06 | is able to analyse and interpret measurement results | X1A_U02 |
| KF_U07 | is able to use tools and numerical methods to solve selected issues of physical data analysis and to develop measurement results | X1A_U02, X1A_U04 |
| KF_U08 | can design and build simple electrical and electronic systems | X1A_U03 |
| KF_U09 | can use mathematical formalism to analyse physical models | X1A_U01 |
| KF_U10 | can describe basic micro- and macroscopic properties of the matter based on the knowledge gained | X1A_U01 |
| KF_U11 | can write a simple computer programme by themselves | X1A_U04 |
| KF_U12 | can run and test computer programmes | X1A_U04 |

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| KF_U13 | is able to prepare a study containing the analysis and discussion of the obtained experimental results | X1A_U05, X1A_U08 |
| KF_U14 | is able to work individually and in a team; is able to estimate the time required to conduct the commissioned task | X1A_K02, X1A_K03, X1A_U03 |
| KF_U15 | can obtain information from literature, databases and other sources; can integrate and interpret information obtained, draw conclusions and formulate and justify opinions | X1A_U03, X1A_U07 |
| KF_U16 | has a sufficient level of English (B2) to read the specialist literature, and manuals for IT devices and tools | X1A_U10 |
| KF_U17 | is able to clearly present the problem/point of view to the specialist and the layman | X1A_U06 |
| KF_U18 | is able to prepare a typical written study on specific physics issues using basic theoretical models | X1A_U08 |
| KF_U19 | has the ability to prepare and deliver an oral presentation in their native and English languages, using modern multimedia techniques | X1A_U09 |
| KF_U20 | has the ability to self-learn, e.g. to improve professional competence | X1A_U07 |
| KF_U21 | has English language skills at the intermediate level in accordance with the requirements (B2/CEFR) | X1A_U10 |
| KF_U22 | has the ability to pose and analyse problems based on the acquired content from the discipline of science not related to the programme | |
| SOCIAL COMPETENCES | | |
| KF_K01 | knows the limitations of their own knowledge and understands the need for further education | X1A_K01, X1A_K05 |
| KF_K02 | is able to precisely formulate questions in order to deepen their own understanding of a given topic or to find the missing elements of reasoning | X1A_K01, X1A_K02 |
| KF_K03 | is able to work in a group adopting different roles; understands the division of tasks and the individual's need to fulfil a given task | X1A_K02 |
| KF_K04 | understands the need to improve professional and personal competences | X1A_K05 |
| KF_K05 | understands and appreciates the importance of intellectual honesty in their own and others' actions; acts ethically | X1A_K04 |
| KF_K06 | understands social aspects of applying the knowledge and skills acquired and the associated responsibility | X1A_K06 |
| KF_K07 | is able to listen to a different opinion and professionally discuss the issue in question | X1A_K02, X1A_K03 |
| KF_K08 | is able to identify priorities for the implementation of the task specified by themselves or others | X1A_K03 |
| KF_K09 | can think and act in terms of entrepreneurship (costs, economic effects, profit and loss account, profitability) | X1A_K07 |
| KF_K10 | understands the need for an interdisciplinary approach to solving problems, integrating knowledge from different disciplines and practising self-education to deepen the acquired knowledge | |