Curriculum

Field of study: Computer Physics

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General characteristics of the field of study

Basic information

Faculty name:	Faculty of Physics and Applied Computer Science
Field of study:	Computer Physics
Level:	First-cycle (engineer) programme
Profile:	General academic
Form:	Full-time studies
ISCED classification:	0533
Number of ECTS credits necessary to complete studies at a given level:	210
Professional title awarded to graduates:	inżynier
Cycle start date:	2024/2025, winter semester
Duration of studies (number of semesters):	7

Field of science to which the field of study is assigned:

Field of the exact and natural sciences
Field engineering and technical sciences

Discipline of science to which the field of study is assigned:

Discipline	Percentage	ECTS
Physical sciences	78%	164
Technical computing and telecommunications	22%	46

Relationship between the field of study and the AGH University development strategy and the AGH University mission

The Faculty of Physics and Applied Computer Science, possessing the highest possible scientific category in Poland (A+) applies for the possibility to open a new field of studies, “Computer physics”, which will allow the candidates to acquire skills both in physics and computer science. Right after the first-cycle studies graduates will be able to find attractive employment as computer programmers. Alternatively they can pursue second-cycle studies and then start their scientific career. The acquired skills will enable them to participate in scientific research focused on the structure of matter and complex systems (the solid state, the environment, atmosphere and hydrosphere). Teaching will be carried out in English in order to prepare the students for future work in a multi-cultural environment of large international science centres and IT corporations.

The Development Strategy of AGH UST, revealed in the resolution No. 2/2017 of the Senate (section “Education”, point 3) points at the need of broadening the range of teaching offered to students, specifically by:

“… opening new fields of studies and specializations, with syllabuses adapted to changing expectations of the labour market, also profiting from collaboration with employees”.

The proposed field of studies is in line with this policy.

Furthermore, creating the field “Computer physics” is in agreement with the Mission of AGH UST. The University aims at “creating new fields of studies, according to international development trends”. The proposed studies will prepare the students to accept the challenges of the labour market and to start their research careers.

According to the University’s mission “AGH UST carries out research at high, international level in diverse fields and disciplines, which is the basis of high teaching level and staff development as well as one of the pillars of the very functioning and position of the University.” The proposed field will be based on the “physics” discipline and managed by the Faculty of Physics and Applied Computer Science, a faculty consequently awarded with the highest scientific category (A+) from 2013 on, with expertise and numerous successes in teaching computer science specialists, much sought for at the labour market.

In the “Education” section the above-mentioned Strategy aims at preparing graduates with "strong professional qualifications”. The proposed studies will train students to become computer programmers, who are currently very much in demand at the job market.

The Strategy also points at the “internationalization of teaching”, “perfecting the teaching offer in foreign languages” and “promoting the enrollment of foreign students, with special emphasis on those originating from Eastern Europe and Asia”. The studies, offered in English, will be open to students from abroad as well.

Furthermore, the Strategy involves “actions stimulating top-level research” and “support and introduction of mechanisms of development for young scientists”. A Polish-language specialty “Computer physics” (“Fizyka komputerowa”) run in the frame of the “Technical physics” (“Fizyka techniczna”) field was an important source of future PhD students at the Faculty. After the year 2000 around 20 graduates of this specialty received their PhDs in physics. Among the graduates of this, not currently existing, specialty there are 10 Professors and University Professors working at FPACS and in ACMIN.

Information on taking into account the socio-economic demand while creating the curriculum and indication of the assumed learning outcomes matching the identified demand

The Faculty has asked three renowned companies for an opinion concerning the proposed studies. All responses were unanimously very positive.

Dassault Systemes, the second IT company in Europe in terms of revenue, manufacturing, among others, software for physical computer simulations of systems, devices and processes points out that the job market is in need of programmers with broad perspectives, also with understanding of other disciplines, such as physics. The company states that the “Computer physics” studies go in line with its vision, that is modeling, simulating and evaluating before taking actions in the real world. Dassault Systemes are willing to provide internships for “Computer physics” students, which could be extended to a collaboration at the bachelor’s thesis level with a view at future employment.

Comarch S.A. notes that the proposed program, with courses in analysis, algebra, computational methods and statistics, along with the acquired skills in the area of algorithm development and programming is valuable due to the ever growing interest in employees capable of becoming part of the company’s research teams, which are often interdisciplinary. The curriculum responds to the needs of the company. Vice-President of Comarch points at his positive experience with the

Polish language “Computer physics” specialization, which once closed, we would now like to revive in a new shape.

IBM POLSKA, in turn, focuses on the fact that graduates will be able to find jobs in the developing area of quantum technologies and points out that English as the course language will facilitate the students’ future work in international teams.

Education paths – scope in Polish and in English

n/a

Graduation paths – scope in Polish and in English

n/a

The names of the majors in Polish and in English

Name [pl]	Name [en]

General information about the curriculum

Field of study: Computer Physics

General information related to the curriculum (general learning objectives and employment opportunities, typical jobs and opportunities for graduate continuing education)

A graduate in Computer Physics will possess necessary skills to work as a computer programmer, but will also be capable of participating in physics research. However, the latter will additionally require the second-cycle studies, such as for instance Technical Physics (Fizyka Techniczna) at the Faculty of Physics and Computer Science. A graduate can also pursue their education in the field of computer science, choosing for example Applied Computer Science (Informatyka Stosowana) at the Faculty of Physics and Applied Computer Science or other similar studies (e.g. Data science at the Faculty of Computer Science, Electronics and Telecommunications). After graduating from the first-cycle studies the students will readily find satisfying jobs on the IT market. Furthermore, physicists with expertise in programming and computational methods may be a useful asset for companies dealing with simulations of industrial systems. Banks and insurance companies are also among potential employers, as they may profit from the graduates' skills in the field of computer modelling.

Information on including the conclusions from the students and graduates careers monitoring in the curriculum

In the Career Centre report describing the outcomes of the Faculty’s 2019 graduates the latter point out that their knowledge of programming languages, including C, C++, Java and Python often lead to employment.

Information on including the requirements and recommendations of the accreditation committees, in particular the Polish Accreditation Committee and industry accreditation committees in the curriculum

All guidelines of the Polish Accreditation Committee are taken into account in designing and correcting the curricula.

Information on including examples of good practice in the curriculum

The Catalogue of Good Practices available at https://www.agh.edu.pl/ksztalcenie/jakosc-ksztalcenia/ksiega-jakosci-agh/katalog-dobrych-praktyk/ is limited. While preparing the present application we have not been able to apply any of the specified twelve examples. However, the Faculty’s promotion team, common to all fields of studies offered at the Faculty, has consulted external stakeholders to investigate the usefulness of the proposed new “Computer physics” studies. Moreover, we have prepared a survey in order to check if such offer might prove interesting and received over 1100 responses from high-school students of the Malopolska region and neighboring voivodeships. We would suggest adding such survey to the Catalogue of Good Practices for opening new fields of studies.

Information on cooperation in the preparation of the curriculum with external stakeholders, in particular associations, professional and social organizations

The proposed program has been sent to potentially interested companies, all of which already employ the graduates of “Computer physics”. We are in possession of an opinion endorsing our proposal from Dassault Systemes, one of the leading European IT companies, dealing with modelling and simulation software, using computational physics techniques. The company expresses the will to provide internship possibilities for our future students with a view of employment after graduating from the second-cycle studies. Also two other leading IT companies, Comarch and IBM POLSKA, expressed their high opinions about our proposal and a strong motivation to collaborate with the graduates.

Duration, rules and form of the practical placement

The aim of the practical placement is to gain expertise in team work, to learn the requirements of future employers and to facilitate the search for a job after graduation. The practical placement is organized during summer holidays after the third year of studies, it lasts four weeks, with a five-day work week and an 8-hour work day (160 hours in total). A student receives 6 ECTS points for completing the placement. The student is responsible for finding and selecting the placement location. The placement is based on the “placement agreement” signed by the Faculty and the employer.

Admission criteria, rules and policies

Field of study: Computer Physics

Description of competences expected from the candidate applying for admission to studies

Interest in physics. Good working knowledge of mathematics, physics and computer science at high school level.

Recruitment conditions, including the winners and finalists of the central level high school scientific Olympics, as well as winners of international and national contests

Enrollment criteria compliant with the Senate’s resolution. Maximum enrollment index awarded to laureates and finalists of contests, as for “Technical physics” or “Applied Computer Science”.

The expected limit of admissions to studies along with an indication of the minimum number of admitted candidates required to successfully launch a study cycle

Limit: 24. Minimum number of enrolled students: 10.

Learning outcomes

Field of study : Computer Physics

Knowledge

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CMP1A_W01	student knows and understands mathematical methods used in science and engineering, particularly in: scientific computing and data handling	P6S_WG_A
CMP1A_W02	student knows and understands basic concepts of general, applied and modern physics and technology	P6S_WG_A_Inz, P6S_WG_A
CMP1A_W03	student knows and understands algorithms, numerical methods, programming techniques and IT tools used for computer physics	P6S_WG_A
CMP1A_W04	student knows and understands the role of science and engineering for socio-economic environment and knowledge-based society, taking into account ethical and legal paradigms	P6S_WK_A, P6S_WK_A_Inz

Skills

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CMP1A_U01	student can handle complex problems of science and technology using appropriate tools of scientific computing	P6S_UW_A_Inz_01, P6S_UW_A
CMP1A_U02	student can undertake new approaches for non-typical or novel scientific and technological problems	P6S_UW_A
CMP1A_U03	student can perform analytical breakdown of technical or physical problem to propose cost and time-efficient solutions	P6S_UW_A_Inz_02, P6S_UW_A
CMP1A_U04	student can share knowledge with scientific community using clear and concise communications methods using native or foreign languages on B2 level	P6S_UK_A
CMP1A_U05	student can lead a scientific, interdisciplinary project alone or in collaboration, with the awareness of the role of self-directed and lifelong learning for success	P6S_UU_A, P6S_UO_A

Social competence

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CMP1A_K01	student is ready for reviewing their own competences and external content, gathered from various sources, in context of the state-of-the-art in science and technology	P6S_KK_A
CMP1A_K02	student is ready to transfer and share their professional expertise to the industry and society for the sake of science commercialization and public interest	P6S_KO_A
CMP1A_K03	student is ready to take responsibility for his professional activity and to obey legal and ethical rules pertinent to professional environment	P6S_KR_A

Compliance table of engineering competence (Inz) with directional learning outcomes (KEU)

Major : Computer Physics

Knowledge

CEU symbol	Learning outcomes for qualifications including engineering competence	KEU references
P6S_WG_A_Inz	knowledge of basic processes taking place in the life cycle of technical devices, facilities and systems	CMP1A_W02
P6S_WK_A_Inz	knowledge of basic principles of creating and developing various forms of individual entrepreneurship	CMP1A_W04

Skills

CEU symbol	Learning outcomes for qualifications including engineering competence	KEU references
P6S_UW_A_Inz_01	ability to plan and carry out experiments, including measurements and computer simulations as well as to interpret the obtained results and draw conclusions out of them. When identifying and formulating the specification of engineering problems and solving them, being able to: - use analytical, simulation and experimental methods; - recognize their systemic and non-technical aspects, including ethical connotations; - conduct a preliminary economic assessment of the proposed solutions and planned engineering activities; - perform a critical analysis of the functioning of existing technical solutions to further evaluate them;	CMP1A_U01
P6S_UW_A_Inz_02	ability to design solutions in compliance with the given specification as well as being able to: create simple devices, facilities and systems typical for the study major or implement processes using skillfully chosen methods, techniques, tools and materials	CMP1A_U03

Field of study-prescribed outcomes coverage matrix

Field of study: Computer Physics

2024/2025/S/Ii/FiIS/CMP/all

Course	Code	Semestr	CMP1A_W01	CMP1A_W02	CMP1A_W03	CMP1A_W04	CMP1A_U01	CMP1A_U02	CMP1A_U03	CMP1A_U04	CMP1A_U05	CMP1A_K01	CMP1A_K02	CMP1A_K03
Introduction to scientific English	JCMPS.Ii1JO.61f2b4ad315bd.24	1s								x				
Introduction to physics	JCMPS.Ii1P.61f1203bd4d53.24	1s	x	x			x		x		x	x		
Mathematical Analysis 1	JCMPS.Ii1P.4ec9252d59607bcc5bc5b8422e1b5182.24	1s	x				x	x	x				x	
Higher algebra	JCMPS.Ii1P.39914e74ca9214af32bbba8023907d84.24	1s	x				x					x		
Introduction to Unix systems	JCMPS.Ii1K.2df7b31017c2537eaaee6dfbb863521a.24	1s			x		x		x					
Programming languages 1	JCMPS.Ii1K.61f10d4ae595c.24	1s	x		x		x					x		
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f121d2de922.24	2s								x				
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f1223c05d88.24	2s								x				
Mechanics	JCMPS.Ii2P.61f120e22f4d6.24	2s		x						x		x		
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f12258de581.24	2s								x				
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f122766bc01.24	2s								x				
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f1229b3a5a5.24	2s								x				

Course	Code	Semestr	CMP1A_W01	CMP1A_W02	CMP1A_W03	CMP1A_W04	CMP1A_U01	CMP1A_U02	CMP1A_U03	CMP1A_U04	CMP1A_U05	CMP1A_K01	CMP1A_K02	CMP1A_K03
Mathematical Analysis 2	JCMPS.Ii2P.3d4adc4c0e85ba0afc9317c1bd5592a1.24	2s	x				x	x					x	
Linear algebra	JCMPS.Ii2P.61f12147eb9f0.24	2s	x				x						x	
Differential calculus	JCMPS.Ii2P.24783dd7cc4ac0cafa1b4a631f89e345.24	2s	x								x		x	
Programming languages 2	JCMPS.Ii2K.61f10d4d9855c.24	2s	x		x	x	x		x		x	x	x	
Algorithms and data structures	JCMPS.Ii2K.fe1d983f2444dffe22c4014965205329.24	2s	x		x		x	x	x		x	x	x	x
Electromagnetism and optics	JCMPS.Ii4P.61f1230a50cb5.24	3s		x			x					x		
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f123d936c8f.24	3s								x				
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f123ec2ac65.24	3s								x				
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f123ff51c76.24	3s								x				
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f124109c8ce.24	3s								x				
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f12422e914f.24	3s								x				
Object oriented programming 1	JCMPS.Ii4K.f3e4761cdf41cb9767e42a3a8258af31.24	3s		x	x		x	x	x		x	x	x	
Discrete mathematics	JCMPS.Ii4K.fcac267d4c47fb6be51aad7f4d5aea55.24	3s	x	x	x	x	x	x	x	x	x	x	x	x
Introduction to statistical physics	JCMPS.Ii4K.61f10d5144c19.24	3s	x	x			x	x	x			x	x	x
Statistics	JCMPS.Ii4K.0bb9ced98effdb433e3e2fafd98932fd.24	3s	x	x			x	x			x	x	x	
Fundamentals of analog circuits	JCMPS.Ii8PJO.61f10d5931d02.24	4s	x	x			x	x	x	x	x	x	x	x

Course	Code	Semestr	CMP1A_W01	CMP1A_W02	CMP1A_W03	CMP1A_W04	CMP1A_U01	CMP1A_U02	CMP1A_U03	CMP1A_U04	CMP1A_U05	CMP1A_K01	CMP1A_K02	CMP1A_K03
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f12708ce3d3.24	4s								x				
Introduction to video editing and computer animation	JCMPS.Ii28PJO.61f10d59d611f.24	4s lub 6s	x	x	x		x		x			x	x	
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f1272a2d8e5.24	4s								x				
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f12741e740b.24	4s								x				
Evolutionary computing: From algorithms to applications	JCMPS.Ii8PJO.660d21eb034ed.24	4s	x		x		x	x	x				x	x
Introduction to quantum physics	JCMPS.Ii8K.61f126bd854cd.24	4s	x	x	x		x	x	x			x	x	x
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f127548927a.24	4s								x				
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f1276c6c2f8.24	4s								x				
Physics lab	JCMPS.Ii8K.37bcdb9baedab585ebddaa360ff65cd3.24	4s	x	x			x							x
Numerical methods in physics	JCMPS.Ii8K.61f10d55ca488.24	4s	x		x		x					x		x
Fundamentals of microelectronics and digital circuits	JCMPS.Ii10PJO.61f10d5e4fdbc.24	5s		x	x		x	x	x	x		x	x	x
Introduction to Artificial Intelligence	JCMPS.Ii10K.8668bac069f74b284f5cce3a7a3dee12.24	5s	x		x		x	x	x				x	
Scripting Languages	JCMPS.Ii10PJO.11d8f5778c3806e7a40965ea7a8ac341.24	5s			x		x		x	x		x		
Fundamentals of Data Science	JCMPS.Ii10PJO.631dd7c4949d7680f11db9c8258044c7.24	5s	x		x		x	x				x	x	
Introduction to theoretical physics	JCMPS.Ii10K.61f10d5bddfb5.24	5s	x	x			x	x				x		x

Course	Code	Semestr	CMP1A_W01	CMP1A_W02	CMP1A_W03	CMP1A_W04	CMP1A_U01	CMP1A_U02	CMP1A_U03	CMP1A_U04	CMP1A_U05	CMP1A_K01	CMP1A_K02	CMP1A_K03
Python in the Enterprise	JCMPS.Ii10PJO.9ee0554bd668f8979c460fe371d311d6.24	5s			x	x	x	x		x	x	x	x	x
Agile methodologies and tools	JCMPS.Ii10PJO.61f3b82649f99.24	5s		x	x	x	x			x	x	x		x
Computer physics 1	JCMPS.Ii10K.61f10d5c97811.24	5s			x		x		x					x
Digital systems and microprocessors	JCMPS.Ii20PJO.61f10d6362e0a.24	6s	x	x	x		x		x	x	x	x	x	x
Introduction to solid state physics	JCMPS.Ii20K.61f10d606bfdb.24	6s	x	x		x	x	x				x		x
Deep learning with massively parallel acceleration	JCMPS.Ii20PJO.6376a8a0b87d1.24	6s	x	x	x		x	x	x	x	x	x	x	x
Modern scientific computing	JCMPS.Ii20K.61f10d6100e68.24	6s	x		x		x	x	x			x	x	x
Introduction to Virtual Reality	JCMPS.Ii20PJO.61f10d6419bbd.24	6s	x	x	x	x		x	x		x	x	x	x
Introduction to large-language models	JCMPS.Ii20PJO.660d373f855c2.24	6s	x	x			x		x				x	x
Computer physics 2	JCMPS.Ii20K.61f10d6190bc1.24	6s	x		x		x		x	x				
Professional practice	JCMPS.Ii20K.557aa2c67bc9c194cb3ea1eac55ffe27.24	6s				x	x	x	x	x	x		x	x
Final Project	JCMPS.Ii40K.d0b468d65b7dc665a0381d9957a5c950.24	7s	x	x	x	x	x	x	x	x	x	x	x	x
Introduction to environmental physics	JCMPS.Ii40K.61f10d660f887.24	7s	x	x	x	x	x			x	x	x	x	x
Introduction to nuclear physics	JCMPS.Ii40K.61f10d669fd10.24	7s	x	x		x	x	x	x	x			x	x
Monte Carlo methods in physics	JCMPS.Ii40K.61f1284338cf5.24	7s	x	x	x		x	x	x	x	x	x	x	
Computer simulations in physics	JCMPS.Ii40K.61f10d67561f5.24	7s			x		x					x		
Sum (obligatory):			24	15	16	7	29	16	17	9	11	20	18	14
Sum (elective):			8	8	10	3	11	7	9	22	6	10	10	9
Sum:			32	23	26	10	40	23	26	31	17	30	28	23

Characteristics matrix of learning outcomes in relation to modules

Major: Computer Physics

2024/2025/S/Ii/FiIS/CMP/all

Course	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A_Inz_01	P6S_UW_A	P6S_UW_A_Inz_02	P6S_UK_A	P6S_UU_A	P6S_UO_A	P6S_KK_A	P6S_KO_A	P6S_KR_A
Introduction to scientific English	JCMPS.Ii1JO.61f2b4ad315bd.24	1s								x					
Introduction to physics	JCMPS.Ii1P.61f1203bd4d53.24	1s	x	x			x	x	x		x	x	x		
Mathematical Analysis 1	JCMPS.Ii1P.4ec9252d59607bcc5bc5b8422e1b5182.24	1s	x				x	x	x					x	
Higher algebra	JCMPS.Ii1P.39914e74ca9214af32bbba8023907d84.24	1s	x				x	x					x		
Introduction to Unix systems	JCMPS.Ii1K.2df7b31017c2537eaaee6dfbb863521a.24	1s	x				x	x	x						
Programming languages 1	JCMPS.Ii1K.61f10d4ae595c.24	1s	x				x	x					x		
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f121d2de922.24	2s								x					
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f1223c05d88.24	2s								x					
Mechanics	JCMPS.Ii2P.61f120e22f4d6.24	2s	x	x						x			x		
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f12258de581.24	2s								x					
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f122766bc01.24	2s								x					

Course	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A_Inz_01	P6S_UW_A	P6S_UW_A_Inz_02	P6S_UK_A	P6S_UU_A	P6S_UO_A	P6S_KK_A	P6S_KO_A	P6S_KR_A
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	JCMPS.Ii2JO.61f1229b3a5a5.24	2s								x					
Mathematical Analysis 2	JCMPS.Ii2P.3d4adc4c0e85ba0afc9317c1bd5592a1.24	2s	x				x	x						x	
Linear algebra	JCMPS.Ii2P.61f12147eb9f0.24	2s	x				x	x						x	
Differential calculus	JCMPS.Ii2P.24783dd7cc4ac0cafa1b4a631f89e345.24	2s	x								x	x		x	
Programming languages 2	JCMPS.Ii2K.61f10d4d9855c.24	2s	x		x	x	x	x	x		x	x	x	x	
Algorithms and data structures	JCMPS.Ii2K.fe1d983f2444dffe22c4014965205329.24	2s	x				x	x	x		x	x	x	x	x
Electromagnetism and optics	JCMPS.Ii4P.61f1230a50cb5.24	3s	x	x			x	x					x		
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f123d936c8f.24	3s								x					
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f123ec2ac65.24	3s								x					
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f123ff51c76.24	3s								x					
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f124109c8ce.24	3s								x					
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	JCMPS.Ii4JO.61f12422e914f.24	3s								x					
Object oriented programming 1	JCMPS.Ii4K.f3e4761cdf41cb9767e42a3a8258af31.24	3s	x	x			x	x	x		x	x	x	x	
Discrete mathematics	JCMPS.Ii4K.fcac267d4c47fb6be51aad7f4d5aea55.24	3s	x	x	x	x	x	x	x	x	x	x	x	x	x
Introduction to statistical physics	JCMPS.Ii4K.61f10d5144c19.24	3s	x	x			x	x	x				x	x	x

Course	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A_Inz_01	P6S_UW_A	P6S_UW_A_Inz_02	P6S_UK_A	P6S_UU_A	P6S_UO_A	P6S_KK_A	P6S_KO_A	P6S_KR_A
Statistics	JCMPS.Ii4K.0bb9ced98effdb433e3e2fafd98932fd.24	3s	x	x			x	x			x	x	x	x	
Fundamentals of analog circuits	JCMPS.Ii8PJO.61f10d5931d02.24	4s	x	x			x	x	x	x	x	x	x	x	x
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f12708ce3d3.24	4s								x					
Introduction to video editing and computer animation	JCMPS.Ii28PJO.61f10d59d611f.24	4s lub 6s	x	x			x	x	x				x	x	
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f1272a2d8e5.24	4s								x					
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f12741e740b.24	4s								x					
Evolutionary computing: From algorithms to applications	JCMPS.Ii8PJO.660d21eb034ed.24	4s	x				x	x	x					x	x
Introduction to quantum physics	JCMPS.Ii8K.61f126bd854cd.24	4s	x	x			x	x	x				x	x	x
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f127548927a.24	4s								x					
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	JCMPS.Ii8JO.61f1276c6c2f8.24	4s								x					
Physics lab	JCMPS.Ii8K.37bcdb9baedab585ebddaa360ff65cd3.24	4s	x	x			x	x							x
Numerical methods in physics	JCMPS.Ii8K.61f10d55ca488.24	4s	x				x	x					x		x
Fundamentals of microelectronics and digital circuits	JCMPS.Ii10PJO.61f10d5e4fdbc.24	5s	x	x			x	x	x	x			x	x	x
Introduction to Artificial Intelligence	JCMPS.Ii10K.8668bac069f74b284f5cce3a7a3dee12.24	5s	x				x	x	x					x	

Course	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A_Inz_01	P6S_UW_A	P6S_UW_A_Inz_02	P6S_UK_A	P6S_UU_A	P6S_UO_A	P6S_KK_A	P6S_KO_A	P6S_KR_A
Scripting Languages	JCMPS.Ii10PJO.11d8f5778c3806e7a40965ea7a8ac341.24	5s	x				x	x	x	x			x		
Fundamentals of Data Science	JCMPS.Ii10PJO.631dd7c4949d7680f11db9c8258044c7.24	5s	x				x	x					x	x	
Introduction to theoretical physics	JCMPS.Ii10K.61f10d5bddfb5.24	5s	x	x			x	x					x		x
Python in the Enterprise	JCMPS.Ii10PJO.9ee0554bd668f8979c460fe371d311d6.24	5s	x		x	x	x	x		x	x	x	x	x	x
Agile methodologies and tools	JCMPS.Ii10PJO.61f3b82649f99.24	5s	x	x	x	x	x	x		x	x	x	x		x
Computer physics 1	JCMPS.Ii10K.61f10d5c97811.24	5s	x				x	x	x						x
Digital systems and microprocessors	JCMPS.Ii20PJO.61f10d6362e0a.24	6s	x	x			x	x	x	x	x	x	x	x	x
Introduction to solid state physics	JCMPS.Ii20K.61f10d606bfdb.24	6s	x	x	x	x	x	x					x		x
Deep learning with massively parallel acceleration	JCMPS.Ii20PJO.6376a8a0b87d1.24	6s	x	x			x	x	x	x	x	x	x	x	x
Modern scientific computing	JCMPS.Ii20K.61f10d6100e68.24	6s	x				x	x	x				x	x	x
Introduction to Virtual Reality	JCMPS.Ii20PJO.61f10d6419bbd.24	6s	x	x	x	x		x	x		x	x	x	x	x
Introduction to large-language models	JCMPS.Ii20PJO.660d373f855c2.24	6s	x	x			x	x	x					x	x
Computer physics 2	JCMPS.Ii20K.61f10d6190bc1.24	6s	x				x	x	x	x					
Professional practice	JCMPS.Ii20K.557aa2c67bc9c194cb3ea1eac55ffe27.24	6s			x	x	x	x	x	x	x	x		x	x
Final Project	JCMPS.Ii40K.d0b468d65b7dc665a0381d9957a5c950.24	7s	x	x	x	x	x	x	x	x	x	x	x	x	x
Introduction to environmental physics	JCMPS.Ii40K.61f10d660f887.24	7s	x	x	x	x	x	x		x	x	x	x	x	x
Introduction to nuclear physics	JCMPS.Ii40K.61f10d669fd10.24	7s	x	x	x	x	x	x	x	x				x	x
Monte Carlo methods in physics	JCMPS.Ii40K.61f1284338cf5.24	7s	x	x			x	x	x	x	x	x	x	x	

Course	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A_Inz_01	P6S_UW_A	P6S_UW_A_Inz_02	P6S_UK_A	P6S_UU_A	P6S_UO_A	P6S_KK_A	P6S_KO_A	P6S_KR_A
Computer simulations in physics	JCMPS.li40K.61f10d67561f5.24	7s	x				x	x					x		
Sum (obligatory):			30	15	7	7	29	29	17	9	11	11	20	18	14
Sum (elective):			12	8	3	3	11	12	9	22	6	6	10	10	9
Sum:			42	23	10	10	40	41	26	31	17	17	30	28	23

Matrix of learning outcomes prescribed to a field of study with related forms of classes and the method of testing

Major: Computer Physics

2024/2025/S/Ii/FiIS/CMP/all

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Introduction to scientific English	Project classes, Foreign language classes	Participation in a discussion, Essay, Involvement in teamwork, Activity during classes, Participation in a discussion, Test	CMP1A_U04
Introduction to physics	Workshop classes	Activity during classes, Execution of exercises, Execution of a project, Execution of laboratory classes	CMP1A_W01, CMP1A_W02, CMP1A_U01, CMP1A_U05, CMP1A_U03, CMP1A_K01
Mathematical Analysis 1	Lectures, Auditorium classes	Activity during classes, Test, Examination, Activity during classes, Test, Examination	CMP1A_W01, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_K02
Higher algebra	Lectures, Auditorium classes	Activity during classes, Examination, Activity during classes, Examination	CMP1A_W01, CMP1A_U01, CMP1A_K01
Introduction to Unix systems	Lectures, Laboratory classes	Activity during classes, Test, Activity during classes, Test, Completion of laboratory classes	CMP1A_W03, CMP1A_U01, CMP1A_U03
Programming languages 1	Lectures, Laboratory classes	Activity during classes, Participation in a discussion, Activity during classes, Participation in a discussion, Test, Completion of laboratory classes	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_K01
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Mechanics	Lectures, Auditorium classes	Execution of exercises, Examination, Execution of exercises	CMP1A_W02, CMP1A_U04, CMP1A_K01
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Mathematical Analysis 2	Lectures, Auditorium classes	Examination, Activity during classes, Execution of exercises	CMP1A_W01, CMP1A_U01, CMP1A_U02, CMP1A_K02
Linear algebra	Lectures, Auditorium classes	Activity during classes, Execution of exercises, Activity during classes, Execution of exercises, Test results	CMP1A_W01, CMP1A_U01, CMP1A_K02
Differential calculus	Lectures, Auditorium classes	Activity during classes, Examination, Activity during classes, Examination	CMP1A_W01, CMP1A_U05, CMP1A_K02
Programming languages 2	Lectures, Laboratory classes	Activity during classes, Presentation, Activity during classes, Participation in a discussion, Execution of laboratory classes, Test, Report	CMP1A_W03, CMP1A_W01, CMP1A_W04, CMP1A_U01, CMP1A_U05, CMP1A_U03, CMP1A_K01, CMP1A_K02

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Algorithms and data structures	Lectures, Auditorium classes	Examination, Execution of exercises, Test	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_U05, CMP1A_U03, CMP1A_U02, CMP1A_K01, CMP1A_K02, CMP1A_K03
Electromagnetism and optics	Lectures, Auditorium classes	Examination, Execution of exercises	CMP1A_W02, CMP1A_U01, CMP1A_K01
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Object oriented programming 1	Lectures, Laboratory classes	Activity during classes, Participation in a discussion, Execution of laboratory classes, Completion of laboratory classes, Activity during classes, Participation in a discussion, Execution of laboratory classes, Completion of laboratory classes	CMP1A_W02, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U05, CMP1A_U03, CMP1A_K01, CMP1A_K02
Discrete mathematics	Lectures, Auditorium classes	Test, Examination, Test, Oral answer	CMP1A_W01, CMP1A_W02, CMP1A_W03, CMP1A_W04, CMP1A_U01, CMP1A_U02, CMP1A_U04, CMP1A_U03, CMP1A_U05, CMP1A_K01, CMP1A_K02, CMP1A_K03
Introduction to statistical physics	Lectures, Auditorium classes	Activity during classes, Participation in a discussion, Activity during classes, Execution of exercises, Test, Oral answer	CMP1A_W02, CMP1A_W01, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_K01, CMP1A_K02, CMP1A_K03
Statistics	Lectures, Auditorium classes, Laboratory classes	Activity during classes, Participation in a discussion, Test, Activity during classes, Participation in a discussion, Execution of laboratory classes, Oral answer, Activity during classes, Participation in a discussion, Execution of exercises, Execution of laboratory classes	CMP1A_W01, CMP1A_W02, CMP1A_U01, CMP1A_U02, CMP1A_U05, CMP1A_K01, CMP1A_K02
Fundamentals of analog circuits	Workshop classes	Activity during classes, Test, Report	CMP1A_W01, CMP1A_W02, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U04, CMP1A_U05, CMP1A_K01, CMP1A_K02, CMP1A_K03
English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Introduction to video editing and computer animation	Workshop classes	Activity during classes, Project, Presentation	CMP1A_W01, CMP1A_W03, CMP1A_W02, CMP1A_U01, CMP1A_U03, CMP1A_K01, CMP1A_K02
Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Evolutionary computing: From algorithms to applications	Lectures, Laboratory classes, Project classes	Test results, Activity during classes, Report on completion of a practical placement, Engineering project	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_U03, CMP1A_U02, CMP1A_K02, CMP1A_K03
Introduction to quantum physics	Lectures, Auditorium classes	Activity during classes, Participation in a discussion, Examination, Oral answer, Activity during classes, Participation in a discussion, Execution of exercises, Test, Oral answer	CMP1A_W01, CMP1A_W02, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_K01, CMP1A_K02, CMP1A_K03
French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CMP1A_U04
Physics lab	Laboratory classes	Activity during classes, Report, Completion of laboratory classes	CMP1A_W01, CMP1A_W02, CMP1A_U01, CMP1A_K03

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Numerical methods in physics	Lectures, Laboratory classes	Activity during classes, Execution of laboratory classes, Report, Activity during classes, Report	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_K01, CMP1A_K03
Fundamentals of microelectronics and digital circuits	Workshop classes	Activity during classes, Test, Report	CMP1A_W02, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U04, CMP1A_K01, CMP1A_K02, CMP1A_K03
Introduction to Artificial Intelligence	Lectures, Laboratory classes	Activity during classes, Examination, Activity during classes, Test, Examination	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_K02
Scripting Languages	Lectures, Laboratory classes, Project classes	Participation in a discussion, Project, Execution of laboratory classes, Project, Project	CMP1A_W03, CMP1A_U01, CMP1A_U03, CMP1A_U04, CMP1A_K01
Fundamentals of Data Science	Lectures, Laboratory classes, Project classes	Execution of laboratory classes, Project, Execution of laboratory classes, Test, Project, Report	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_K01, CMP1A_K02
Introduction to theoretical physics	Lectures, Auditorium classes, Laboratory classes	Examination, Activity during classes, Execution of exercises, Report, Completion of laboratory classes	CMP1A_W01, CMP1A_W02, CMP1A_U02, CMP1A_U01, CMP1A_K01, CMP1A_K03
Python in the Enterprise	Lectures, Laboratory classes, Project classes	Activity during classes, Project, Activity during classes, Project, Project	CMP1A_W03, CMP1A_W04, CMP1A_U01, CMP1A_U02, CMP1A_U04, CMP1A_U05, CMP1A_K01, CMP1A_K02, CMP1A_K03
Agile methodologies and tools	Lectures, Laboratory classes, Project classes	Activity during classes, Participation in a discussion, Oral answer, Activity during classes, Participation in a discussion, Completion of laboratory classes, Participation in a discussion, Project	CMP1A_W02, CMP1A_W03, CMP1A_W04, CMP1A_U01, CMP1A_U04, CMP1A_U05, CMP1A_K01, CMP1A_K03

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Computer physics 1	Lectures, Laboratory classes	Activity during classes, Execution of laboratory classes, Report, Activity during classes, Execution of laboratory classes, Report	CMP1A_W03, CMP1A_U01, CMP1A_U03, CMP1A_K03
Digital systems and microprocessors	Workshop classes	Activity during classes, Participation in a discussion, Test, Report, Completion of laboratory classes	CMP1A_W01, CMP1A_W03, CMP1A_W02, CMP1A_U01, CMP1A_U03, CMP1A_U05, CMP1A_U04, CMP1A_K02, CMP1A_K03, CMP1A_K01
Introduction to solid state physics	Workshop classes	Project, Examination, Report, Preparation and conduct of scientific research	CMP1A_W01, CMP1A_W02, CMP1A_W04, CMP1A_U02, CMP1A_U01, CMP1A_K01, CMP1A_K03
Deep learning with massively parallel acceleration	Lectures, Laboratory classes, Project classes	Activity during classes, Case study, Oral answer, Activity during classes, Report, Case study, Oral answer, Report, Case study	CMP1A_W01, CMP1A_W02, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U04, CMP1A_U05, CMP1A_K01, CMP1A_K02, CMP1A_K03
Modern scientific computing	Lectures, Project classes	Execution of a project, Report, Presentation, Execution of a project, Report, Presentation	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_K01, CMP1A_K03, CMP1A_K02
Introduction to Virtual Reality	Workshop classes	Execution of a project, Involvement in teamwork, Completion of laboratory classes	CMP1A_W02, CMP1A_W01, CMP1A_W03, CMP1A_W04, CMP1A_U02, CMP1A_U03, CMP1A_U05, CMP1A_K01, CMP1A_K02, CMP1A_K03
Introduction to large-language models	Lectures, Laboratory classes, Project classes	Test results, Completion of laboratory classes, Engineering project	CMP1A_W02, CMP1A_W01, CMP1A_U01, CMP1A_U03, CMP1A_K03, CMP1A_K02

Name of the module	Activity	Method of verification and assessment of learning outcomes achieved by the student in individual forms of classes and activities for the entire module	KEU references
Computer physics 2	Lectures, Laboratory classes	Examination, Execution of laboratory classes	CMP1A_W01, CMP1A_W03, CMP1A_U01, CMP1A_U03, CMP1A_U04
Professional practice	Practical placement	Report on completion of a practical placement, Work done within the framework of a practical placement, Confirmation of completion of practical placement programme	CMP1A_W04, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U05, CMP1A_U04, CMP1A_K02, CMP1A_K03
Final Project	Diploma project	Diploma thesis preparation	CMP1A_W01, CMP1A_W02, CMP1A_W03, CMP1A_W04, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U05, CMP1A_U04, CMP1A_K02, CMP1A_K03, CMP1A_K01
Introduction to environmental physics	Lectures, Auditorium classes, Laboratory classes	Activity during classes, Execution of exercises, Presentation, Preparation and conduct of scientific research, Execution of laboratory classes, Report, Involvement in teamwork	CMP1A_W01, CMP1A_W02, CMP1A_W03, CMP1A_W04, CMP1A_U01, CMP1A_U04, CMP1A_U05, CMP1A_K01, CMP1A_K03, CMP1A_K02
Introduction to nuclear physics	Lectures, Auditorium classes, Laboratory classes	Examination, Activity during classes, Execution of exercises, Test, Completion of laboratory classes	CMP1A_W01, CMP1A_W02, CMP1A_W04, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U04, CMP1A_K02, CMP1A_K03
Monte Carlo methods in physics	Lectures, Laboratory classes	Completion of laboratory classes, Activity during classes, Execution of laboratory classes	CMP1A_W01, CMP1A_W02, CMP1A_W03, CMP1A_U01, CMP1A_U02, CMP1A_U03, CMP1A_U04, CMP1A_U05, CMP1A_K01, CMP1A_K02
Computer simulations in physics	Lectures, Laboratory classes	Execution of laboratory classes, Execution of laboratory classes	CMP1A_W03, CMP1A_U01, CMP1A_K01

Detailed rules of the implementation of the curriculum estabilished by the Dean of the Faculty (the so-called Study Rules)

Field of study: Computer Physics

Enrollment rules for the next semester

In order to be registered for the next semester of studies a students has to present in the Dean's Office their semester study plan in the form and before the deadline established by the Dean.

Enrollment rules for the next semester as a part of the so-called ECTS credits debt ceiling

The ECTS credit deficit cannot exceed the value in the field above. Additionally, each student has to:

- complete the module "Mathematical analysis 1" before being registered for the second semester,
- complete the module "Mechanics" before being registered for the third semester,
- choose the topic of their Bachelor's Thesis project before being registered for the seventh semester.

ECTS credits debt ceiling

12

Organization of classes within the so-called blocks of classes (i.e. such organization of subjects or individual forms of classes that creates exceptions to the cyclical nature of classes in particular weeks of a given semester of studies)

Any deviations from periodicity of classes in consecutive weeks are the responsibility of the course coordinator and are reported to the planning and accounting section directly before the semester in which the course takes place.

Monitoring semesters

1, 2, 6

Study rules in case of the individual organization of studies approved for a specific student

A student can start individual studies from the fifth semester of the first-cycle program, provided that his average grade is larger than or equal 4.0 and that he or she possesses a declaration of a university teacher taking responsibility for the supervision of the individual study program.

Implementation of practical placements including monitoring system and completion rules

- The choice, realization and awarding credit for practical placements will be supervised by the Dean's Plenipotentiary for Student Placements, appointed separately for each field of studies by the Dean for his whole term of office.
- During the course of a placement each student is required to fill in the placement journal.
- Upon completion of the placement a student receives a certificate issued by an external supervisor of the placement.
- The placement report is verified by the Dean's Plenipotentiary for Student Placements.
- On the basis of presented documents (the placement journal, certificate of completion, placement report) and in agreement with the AGH-UST study regulations the placement will be completed with the notation "zaliczono" ("zal.") [Polish equivalent of "passed"] or "niezaliczono" (""nzal"") [Polish equivalent of "failed"].

Rules of elective modules taking

- Elective courses can be selected from the study plan or from the University's Database of Elective Courses (UBPO).

- The selection of modules from the University's Database of Elective Courses (UBPO) is done following the rules established in the current directive of the Rector pertaining to this Database.
- Students select modules from the study plan via the USOS computer system following the rules and according to deadlines established each semester by the Deputy Dean for Students' Affairs.
- A teacher (course coordinator) can apply to the Dean for adding a new elective course to the teaching offer of the Faculty, specifying the course title (also in English), proposed forms of classes and numbers of hours along with a short model characteristic.
- The above-mentioned application is accepted by the Deputy Dean for Education, who sets the number of ECTS points assigned to the course and, in agreement with the course .coordinator, the semester in which it will run.
- While establishing the number of ECTS points it is assumed that the total number of student work hours is equal to twice the number of contact hours.

Rules of education paths, graduation paths, major choice/eligibility

n/a

Rules related to the preparation of diploma projects and theses as well as the implementation of the degree granting

1. The process of proposing, accepting, approving, choosing, reviewing and submitting diploma projects is carried out via the USOS computer system.
2. The supervisor of a diploma project at the first-cycle studies must possess at least a PhD degree.
3. In special cases the Deputy Dean for Education may consent to the realization of a diploma project under a supervision of:
   a. An academic teacher possessing at least a PhD degree from a different organizational unit of AGH-UST;
   b. A specialist from outside AGH-UST, possessing at least a PhD degree;
   c. A specialist from outside AGH-UST without a PhD degree, but with sufficient competences and experience to properly finalize the diploma project.
4. The choice and acceptance of diploma project topics follow the rules below:
   a. The project supervisor suggests a topic via the USOS system;
   b. A student chooses a topic from a list and contacts the project supervisor in order to establish their collaboration terms;
   c. The project supervisor chooses from among the students who selected a given topic one student (or two, if the project is designed for two students) and gives his consent to become the supervisor of this particular student;
   d. Project topics along with the names of students assigned to them are accepted by a two-person committee and thus, after acceptance, become compulsory for the students:
   - A committee, separately for each field of study, is appointed by the Deputy Dean for Students' Affairs for the whole term of office of the faculty authorities.
   - Deputy Dean for Students' Affairs becomes automatically a member of this committee.
   e. Project topics proposed by employees from outside the Faculty of Physics and Applied Computer Science need to be accepted by the Deputy Dean for Education.
5. The procedure of submission and revision of diploma projects obeys the following rules:
   a. The student presents his project to the supervisor;
   b. The supervisor accepts it or points out necessary corrections and additions;
   c. After the supervisor's acceptance the student submits his project to the USOS system;
   d. If the diploma project is of the project work type, a computer program or system, a construction or technological work etc., also technical documentation of the project need to be uploaded to USOS, apart from the manuscript;
   e. Not later than seven days after the project's submission to USOS the supervisor suggests a candidate for its reviewer;
   f. Deputy Dean for Students' Affairs either accepts or rejects this candidature (cf. point 5e). In the latter case a new candidate for a reviewer needs to be found and then again either accepted or rejected by the Deputy Dean for Students' Affairs;
   g. An accepted reviewer agrees to or rejects the proposition to write the review, but the latter decision requires justification. If the faculty authorities express such wish, the justification should be filed in writing. In case the rejection is justified, the Deputy Dean for Students' Affairs selects a different reviewer;
   h. The supervisor and the reviewer have 14 days to prepare their reviews and upload them to USOS, counting from the date when the final project version was submitted to USOS.
6. Deadlines concerning:

a. the choice of topics by students and the acceptance of this choice by the supervisors;
b. the final acceptance of topics, supervisors and future graduates by the committee are set each year by the Deputy Dean for Students' Affairs.

7. The topic and the supervisor of the diploma project can be changed in the following circumstances:
   a. The topics can be changed upon supervisor's request, if during the course of project's preparation, for reasons beyond the student's control, it becomes necessary to specify, modify or change it.
   b. A student can only abandon the project and choose another one if he or she repeats the seventh semester of the first-cycle studies.
   c. If the student fails to finalize his diploma project within the deadline set by the study regulations, his supervisor has the right to give up his duties. Such resignation has to be submitted to the Deputy Dean for Students' Affairs in writing.
   d. If a student is required to repeat his or her diploma project, he may choose another topic.

Diploma examination

1. A student shall be admitted to the diploma examination if he or she:
   a. has completed all the courses and practical placements prescribed in the study program;
   b. has registered the diploma project in electronic form in the PDF format via the USOS system;
   c. the project has been positively assessed by the supervisor and the reviewer;
   D. has submitted all the documents required by the Deputy Dean for Students' Affairs and has paid all the required fees.
2. The diploma examination shall take place before a Commission appointed by the Deputy Dean for Students' Affairs. The chairman of the commission shall be the Deputy Dean for Students' Affairs or a person authorized by him.
3. The diploma examination consists in a verification of student's knowledge and skills within the scope of the field of study (general field of study examination) and a discussion about the diploma project. The scope of the general field of study examination is determined by the curriculum for that field of study.
4. Deputy Dean for Students' Affairs establishes the date of the diploma examination (both general field of study examination and the diploma project defense). The examination must take place after the examination session has finished, but sufficiently early to allow a student to take the entrance exam for the second-cycle studies at FPACS in the same academic year.
5. The general field of study examination is a multiple choice test lasting 90 minutes and contains 40 questions. A grade for this examination results from the percentage of correct answers given in the test. Lists of topics for each field of study shall be published at the Faculty web page not later than end of October of the academic year, in which the examination takes place. Example questions with masked answers shall be published along with the topics.
6. Results of the general field of study examination are published in USOS seventy two hours after the examination has finished, at the latest. In case of receiving an unsatisfactory grade from the general field of study examination, the Deputy Dean for Students' Affair shall determine the retake date of this examination.
7. The Commission shall assess the diploma examination during a closed part of its session. The diploma examination grade shall be determined as an arithmetic average of the following grades:
   a. general field of study examination grade;
   b. project presentation grade;
   c. individual grades obtained for answering all questions asked during the course of the examination.
   In case of receiving an unsatisfactory grade from the diploma examination, the Deputy Dean for Students' Affair shall determine the retake date of the diploma examination.
8. In view of the positive result of the diploma examination, the Commission shall decide to award a student with an engineer's degree and shall award a graduation diploma and establish a final grade – the graduation result.
9. The chairman of the Commission shall announce the result of the diploma examination and the graduation result in the presence of its members, immediately after completion of the examination.

Principles for determining the overall evaluation of graduation (the final grade)

The graduation result is calculated as a weighted average of the following grades:

a. Average studies grade, calculated according to the Study Regulations, with a weight if 80%;
b. The final grade of the diploma project, established according to the Study Regulations with a weight of 10%;
c. The diploma examination grade, established by the Commission, with a weight of 10%.

Other requirements related to the implementation of the curriculum resulting from the AGH University Study Regulations or other regulations in force at the University

n/a