Study programme

Major: Computer Science

Table of contents

General characteristics of the major

Basic information

Faculty name:	Faculty of Electrical Engineering, Automatics, Computer Science and Biomedical Engineering
Major name:	Computer Science
Level:	First-cycle (engineer) programme
Profile:	General academic
Form:	Full-time studies
ISCED classification:	
Number of ECTS credits necessary to complete studies at a given level:	210
Professional title awarded to graduates:	inżynier
Cycle start date:	2023/2024, winter semester
Duration of studies (number of semesters):	7

Field of science to which the major is assigned:

Field engineering and technical sciences

Discipline of science to which the major is assigned:

Discipline	Percentage	ECTS
Technical computing and telecommunications	100%	210

Relationship between the major and the AGH UST development strategy and the AGH UST mission

Computer Science offers students not only knowledge and technical education, but also gives them the opportunity to develop their logical, constructive and assertive skills and instill in them the spirit of entrepreneurship and innovation. Thanks to the acquired knowledge and acquired skills, graduates of this faculty will not have problems finding their place in the labor market, finding employment mainly in the rapidly growing IT sector. Education in this field is an essential part of both the department's development strategy as well as the AGH University.

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

The business area of IT is one of the most dynamically developing industries. IT professions, such as computer system administrators, specialists in computer networks, database programmers, software developers, system analysts or IT consultants, are in great demand not only in Poland but also abroad. Current analyzes forecast further strong growth of the labor market in IT areas. The learning outcomes for Computer Science are fully in line with the expectations of a broad group of employers and give graduates the basics to run their own business.

Learning paths - scope in Polish and in English

-

Diploma paths - scope in Polish and in English

-

The names of the specialties in Polish and in English

Name [pl]	Name [en]

General information about the study programme

Major: Computer Science

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

These studies aim to provide knowledge and skills necessary to create and use broadly understood computer systems. They cover both theoretical foundations in the areas of mathematics, physics, computer science, as well as practical aspects, including design and implementation of PC and mobile systems, software development (programming in various languages), systems administration, data analysis, use of programming tools (software libraries, frameworks, and environments), including commercial applications and open-source software. Upon completion of the first-cycle studies, a student acquires knowledge at the engineering level, which is extended by the practical use of this knowledge during student internship after the sixth semester.

Information on the study programme including the conclusions from the students and graduates careers monitoring

The business area of IT is one of the most dynamically developing industries. IT professions, such as computer system administrators, specialists in computer networks, database programmers, software developers, system analysts or IT consultants, are in great demand not only in Poland but also abroad. Current analyzes forecast further strong growth of the labor market in IT areas. The learning outcomes for Computer Science are fully in line with the expectations of a broad group of employers and give graduates the basics to run their own business.

Information on the study programme taking into account the requirements and recommendations of the accreditation committees, in particular the Polish Accreditation Committee and industry accreditation committees

The results and recommendations of the accreditation commissions for the field of Computer Science are analyzed and implemented in the curricula and contents of the modules of the course.

Information on including examples of good practice in the study program

The Education Quality Assurance System of the Faculty ensures that good practices are included in the study program. The Faculty Education Quality Assurance System includes both the decision-making aspect as well as the didactic system monitoring. The Diploma Commission is established to give opinions on the topics of the diploma theses, which are then approved by the Deputy Dean responsible for the field of study. This commission also carries out diploma examinations.

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

The education program for Computer Science studies was developed by a team composed of representatives of various departments. During the discussions on the preparation of the program, experience with external stakeholders such as companies and leading foreign universities were exchanged and taken into account.

Duration, rules and form of the apprenticeship

The student knowledge acquired during the studies is extended by the practical use of this knowledge during a summer student internship after the sixth semester. The student internship in one of the IT industry companies lasts at least four weeks with a total student workload of 120 hours.

Admission criteria, rules and policies

Major: Computer Science

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

Candidates applying for admission are expected to have high competences in the field of mathematics, physics and computer science. Candidates are also required to have sufficient command of the English language.

A candidate needs to register in the "e-Rekrutacja" system and enclose the scanned qualification documents:
https://www.international.agh.edu.pl/eng/regular-studies/application/
The formal requirement is finished secondary school with certificate sufficient to enroll in any university in the country where the certificate was issued.

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

Application for studies will be conducted following the general admission rules enshrined in the relevant AGH Senate resolution. For recruitment conducted in the academic year 2020/2021 it is Resolution No. 97/2019 of the AGH Senate of June 26, 2019, and in the Regulation of the Rector of the AGH University regarding the detailed rules for the organization of admission for studies at AGH in a given academic year.

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

Minimum number of students: 15
Maximum number of students: 30

Learning outcomes

Major : Computer Science

Knowledge

KEU symbol	Directional learning outcomes	CEU symbol
CSC1A_W01	knows and understands the basic concepts of mathematics and physics	P6S_WG_A
CSC1A_W02	knows and understands the concepts from computer science and information systems	P6S_WG_A_Inz
CSC1A_W03	knows and understands the issues in the field of data structures and programming, including databases and computer graphics	P6S_WG_A
CSC1A_W04	knows and understands the mathematical foundations of computer modeling and design	P6S_WG_A_Inz
CSC1A_W05	knows and understands the basic concepts in the field of electrical engineering, electronics, and computer measurement systems	P6S_WG_A_Inz
CSC1A_W06	knows the basic concepts of intellectual property protection, patent rights; has the knowledge necessary to understand non-technical conditions of engineering activities	P6S_WK_A
CSC1A_W07	knows and understands the general principles of creating and developing forms of individual entrepreneurship activity as well as working in a group	P6S_WK_A_Inz

Skills

KEU symbol	Directional learning outcomes	CEU symbol
CSC1A_U01	can work individually and in a team, properly planning work, using a variety of databases, literature and other sources	P6S_UW_A, P6S_UO_A
CSC1A_U02	is able to develop the task documentation and clearly present it on the general forum	P6S_UW_A
CSC1A_U03	has the ability to assess changes in the studied discipline and the ability to self-education	P6S_UU_A
CSC1A_U04	can use the obtained IT knowledge and mathematical models for comprehensive assessment and diagnostics of information systems	P6S_UW_A_Inz_01
CSC1A_U05	when formulating requirements and designing IT solutions, is able to take into account the necessary security and safety principles as well as non-technical aspects	P6S_UW_A_Inz_01
CSC1A_U06	can use a specialized English language in the field of mathematics, physics and computer science	P6S_UK_A
CSC1A_U07	is able to algorithmize the engineering problem and is able to design and perform an appropriate IT system using appropriate methods and tools	P6S_UW_A, P6S_UW_A_Inz_02

Social competence

KEU symbol	Directional learning outcomes	CEU symbol
CSC1A_K01	is aware of the social role of a technical university graduate: professional and ethical behavior, responsibility for himself/herself and the team, lifelong learning	P6S_KR_A
CSC1A_K02	understands the possibilities of commercial use of information systems	P6S_KO_A

KEU symbol	Directional learning outcomes	CEU symbol
CSC1A_K03	understands the non-technical aspects and social effects of the use of IT tools	P6S_KK_A

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

Major : Computer Science

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	CSC1A_W02, CSC1A_W04, CSC1A_W05
P6S_WK_A_Inz	knowledge of basic principles of creating and developing various forms of individual entrepreneurship	CSC1A_W07

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;	CSC1A_U04, CSC1A_U05
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	CSC1A_U07

Directional outcomes coverage matrix

Major: Computer Science

2023/2024/S/Ii/EAIiIB/CSC/all

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
Introduction to Computer Science	ECSCS.Ii1O.3482c650f6076ab4c8d2b37ba7aae2fc.23	1		x	x		x			x									
Introduction to Unix systems	ECSCS.Ii1O.2df7b31017c2537eaaee6dfbb863521a.23	1		x									x			x			
Programming Languages I	ECSCS.Ii1O.b1e90f3c6ff45fc15aa61da4a2329ed6.23	1		x	x											x	x		
Higher algebra	ECSCS.Ii1O.39914e74ca9214af32bbba8023907d84.23	1	x						x	x	x	x			x		x		x
Mathematical Analysis	ECSCS.Ii1O.3a8db8b3d952ebece8dfaf621a34143c.23	1	x			x			x	x	x	x			x				
Discrete mathematics	ECSCS.Ii1O.fcac267d4c47fb6be51aad7f4d5aea55.23	1	x			x											x		
Elective Humanistic Course 1	ECSCS.Ii1O.60ad307cb894e.23	1						x		x	x	x					x	x	x
Elective Humanistic Course 2	ECSCS.Ii2O.60ad309c44253.23	2						x		x	x	x					x	x	x
Physics I	ECSCS.Ii2O.f2428e5301d0765b1ce6c6548b060a8b.23	2	x							x					x		x		
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.a8eea28ed793685c0f9e3473cf83b620.23	2													x				
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.8cde28af23df9f7ab255c368305e9d08.23	2													x				

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.4e7283329845414c8997480d3bea5b29.23	2													x				
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.4f8b27be3def6751b9ffceb4796be96b.23	2													x				
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.d79e2a7b04d11cb631da8c41ede0d9dd.23	2													x				
Algorithms and data structures	ECSCS.Ii2O.fe1d983f2444dffe22c4014965205329.23	2		x		x				x			x	x		x	x		x
Logic in Computer Science	ECSCS.Ii2O.cf369180a216a0366cc35975fd9841a3.23	2	x	x	x	x				x	x	x	x	x	x	x	x		x
Programming Languages II	ECSCS.Ii2O.fdc6d61032fe9acf5802953ca19c99c7.23	2		x	x	x				x	x				x	x	x	x	x
Statistics	ECSCS.Ii2O.0bb9ced98effdb433e3e2fafd98932fd.23	2	x	x						x	x				x		x		x
Differential calculus	ECSCS.Ii2O.24783dd7cc4ac0cafa1b4a631f89e345.23	2	x			x			x	x	x				x		x		x
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii4O.300ee33abb9652455b508d9d45af9e79.23	3													x				
Physics II	ECSCS.Ii4O.b7a2fffbc9cd3de32f129c4482c3144a.23	3	x												x		x		

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.5a3c75c8fac2b5a0783ceb3b9c7d9c98.23	3													x				
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.9a331200fa654c821d96ad5434aa09a8.23	3													x				
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.2792ec57b99b0f28f75f1125b9839b34.23	3													x				
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.3c852f86c53eb5f1f214c902c1d613d0.23	3													x				
Physics lab	ECSCS.li4O.37bcdb9baedab585ebddaa360ff65cd3.23	3	x							x	x						x		
Object oriented programming	ECSCS.li4O.f30a24686c3e538a20d6893f38490a0a.23	3		x	x		x			x	x	x	x	x	x	x		x	x
Databases I	ECSCS.li4O.56fff4b7990dab877d307b8e7162bfe8.23	3			x											x			
Operating Systems	ECSCS.li4O.76cff58f85a90981008842c821b82002.23	3		x						x						x			x
Introduction to Computer Graphics	ECSCS.li4O.21b5f11441d4bb6a2f6ec78a7ae497a3.23	3		x	x											x		x	x
AGH UST International Courses Elective Module sem 4	ECSCS.li8O.3e128b1656d7f7e4847596a9954ce907.23	4		x	x	x							x	x		x			

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.643f4f5964a211a7f803d34132079fa3.23	4													x				
Network Society & Technology	POGJOS.A200000O.a7c76f59f555e3215d634878b698ddcc.23	22																	
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.143e7db5678a2d393271a64a452dac7c.23	4													x				
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.ef4b74e20166ac972af4bb4a15c9afae.23	4													x				
Optical Fibers - Technology and Applications	POGJOS.A100000O.e50956f566d74e42860bbbb0c11e1e6c.23	21																	
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.8f67b761b206666bcb89425b613b4241.23	4													x				
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.e59199a0d131cbf1fcb2df06288246bc.23	4													x				
Distributed Control Systems	POGJOS.A100000O.e5389bc4a8d9e5d2898e87e52124e831.23	21																	

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
Databases II	ECSCS.li8O.692f9176145819252abe0933a6efa804.23	4		x	x								x	x		x			
Innovation for Engineers: Design Thinking and Business Model Generation	POGJOS.A200000O.acd3c14b2af485d387332c294de1684b.23	22																	
Technology in Society	POGJOS.A100000O.8008664454b75ee55bb5458aeddce404.23	21																	
Fundamentals of Data Science	POGJOS.A200000O.631dd7c4949d7680f11db9c8258044c7.23	22																	
Fundamentals of Optimization	POGJOS.A200000O.777bddd8543130c93a829f73a1bd03a2.23	22																	
Basics of Design in SolidWorks 3D CAD Software	POGJOS.A100000O.ce7ffcde3328545e011bec9d6b6b3482.23	21																	
Introduction to Geoinformatics	POGJOS.A200000O.2ccd602bd84cf5fd5410279a98aaa3e5.23	22																	
Python in Engineering Calculations	POGJOS.A100000O.d19a2814acf928b4d00bd879d5d64278.23	21																	
Python Language	ECSCS.li78O.0ca57dd01071a89e81fe5d3559bc5b5a.23	4 lub 5 lub 6 lub 7		x	x					x		x				x			
Software studio I	ECSCS.li8O.e0f77194fa95f5912cb9fe847a4726d5.23	4		x	x			x	x	x		x	x	x			x		
Computer Networks	ECSCS.li8O.ddf71bd4a5b4ae28ab58253386e78e12.23	4		x			x						x	x		x			
Software Engineering	ECSCS.li8O.fca68aa1669c18f1464740d731a256e4.23	4		x	x					x	x		x			x		x	x
AGH UST International Courses Elective Module sem 5	ECSCS.li10O.882c8713a57ce291031a0d06f0c228d6.23	5		x	x	x							x			x			

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
Formal Languages and Compilers	ECSCS.Ii10O.fb9f7823c541196383b3b52dfc91b4c8.23	5	x	x												x			x
Introduction to Artificial Intelligence	ECSCS.Ii10O.8668bac069f74b284f5cce3a7a3dee12.23	5		x		x							x					x	
Software studio II	ECSCS.Ii10O.444eab118568829c0819cc1b5259de6f.23	5		x	x	x				x	x	x	x	x			x	x	x
Introduction to the Semantic Web and Knowledge Graphs	ECSCS.Ii30O.6077f53df2e8d.23	5 lub 6		x						x			x					x	x
Introduction to Process Mining	ECSCS.Ii10O.6077f3a31ec00.23	5		x	x								x		x	x		x	
Introduction to Programming Language Theory	ECSCS.Ii50O.6077f40e8e59f.23	5 lub 7		x	x	x					x			x		x		x	x
Constraint Programming	ECSCS.Ii50O.6245fa382b339.23	5 lub 7			x	x							x			x	x		
Logic Programming	ECSCS.Ii50O.624614f2f0150.23	5 lub 7			x	x						x	x			x			
Graphical Programming Languages	ECSCS.Ii50O.6246131d0da95.23	5 lub 7			x	x				x	x					x	x		x
Digital Electronics and Microprocessors	ECSCS.Ii10O.cfb642ae2d5ae1ae377ed0a319e6f6e5.23	5					x			x	x					x			
AGH UST International Courses Elective Module sem 6	ECSCS.Ii20O.2d028e347ea3c824fc2410a5a1749d82.23	6		x	x	x							x			x			
Cybersecurity	ECSCS.Ii20O.e743fe8ce7708ddbc0f9bded2d81e2b0.23	6		x	x							x	x	x		x		x	x

Subject	Code	Semestr	CSC1A_W01	CSC1A_W02	CSC1A_W03	CSC1A_W04	CSC1A_W05	CSC1A_W06	CSC1A_W07	CSC1A_U01	CSC1A_U02	CSC1A_U03	CSC1A_U04	CSC1A_U05	CSC1A_U06	CSC1A_U07	CSC1A_K01	CSC1A_K02	CSC1A_K03
Web Application Technologies	ECSCS.li20O.48d365d31d17f6a0ba19f2e562e7e8da.23	6		x						x		x							x
Embedded systems	ECSCS.li20O.228078523cb7f097ecc55879565d142c.23	6					x									x		x	
Professional practice	ECSCS.li20O.557aa2c67bc9c194cb3ea1eac55ffe27.23	6								x	x	x	x	x		x	x	x	
Human-Computer Interaction	ECSCS.li20O.6077f3db7a765.23	6		x				x		x	x			x			x	x	x
AGH UST International Courses Elective Module sem 7	ECSCS.li40O.0e37c8e8db3d7d44ada69f5bba6ba5b4.23	7		x	x	x							x			x			
Final Project	ECSCS.li40O.b2d85c6445cb4ca1ad39313aa3034376.23	7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Diploma Seminar	ECSCS.li40O.c31fbe5bec3172c3f6a1fdba22ab38ce.23	7						x		x	x						x		
Sum (obligatory):			11	20	13	9	6	4	5	21	15	11	13	10	10	18	17	11	16
Sum (elective):			0	9	10	8	0	2	0	5	4	3	8	3	16	10	4	5	5
Sum:			11	29	23	17	6	6	5	26	19	14	21	13	26	28	21	16	21

Characteristics matrix of learning outcomes in relation to modules

Major: Computer Science

2023/2024/S/Ii/EAIiIB/CSC/all

Subject	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A	P6S_UO_A	P6S_UU_A	P6S_UW_A_Inz_01	P6S_UK_A	P6S_UW_A_Inz_02	P6S_KR_A	P6S_KO_A	P6S_KK_A
Introduction to Computer Science	ECSCS.Ii1O.3482c650f6076ab4c8d2b37ba7aae2fc.23	1	x	x			x	x							
Introduction to Unix systems	ECSCS.Ii1O.2df7b31017c2537eaaee6dfbb863521a.23	1		x			x			x		x			
Programming Languages I	ECSCS.Ii1O.b1e90f3c6ff45fc15aa61da4a2329ed6.23	1	x	x			x					x	x		
Higher algebra	ECSCS.Ii1O.39914e74ca9214af32bbba8023907d84.23	1	x			x	x	x	x		x		x		x
Mathematical Analysis	ECSCS.Ii1O.3a8db8b3d952ebece8dfaf621a34143c.23	1	x	x		x	x	x	x		x				
Discrete mathematics	ECSCS.Ii1O.fcac267d4c47fb6be51aad7f4d5aea55.23	1	x	x									x		
Elective Humanistic Course 1	ECSCS.Ii1O.60ad307cb894e.23	1			x		x	x	x				x	x	x
Elective Humanistic Course 2	ECSCS.Ii2O.60ad309c44253.23	2			x		x	x	x				x	x	x
Physics I	ECSCS.Ii2O.f2428e5301d0765b1ce6c6548b060a8b.23	2	x				x	x			x		x		
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.a8eea28ed793685c0f9e3473cf83b620.23	2									x				
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii2O.8cde28af23df9f7ab255c368305e9d08.23	2									x				

Subject	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A	P6S_UO_A	P6S_UU_A	P6S_UW_A_Inz_01	P6S_UK_A	P6S_UW_A_Inz_02	P6S_KR_A	P6S_KO_A	P6S_KK_A
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li2O.4e7283329845414c8997480d3bea5b29.23	2									x				
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li2O.4f8b27be3def6751b9ffceb4796be96b.23	2									x				
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li2O.d79e2a7b04d11cb631da8c41ede0d9dd.23	2									x				
Algorithms and data structures	ECSCS.li2O.fe1d983f2444dffe22c4014965205329.23	2		x			x	x		x		x	x		x
Logic in Computer Science	ECSCS.li2O.cf369180a216a0366cc35975fd9841a3.23	2	x	x			x	x	x	x	x	x	x		x
Programming Languages II	ECSCS.li2O.fdc6d61032fe9acf5802953ca19c99c7.23	2	x	x			x	x			x	x	x	x	x
Statistics	ECSCS.li2O.0bb9ced98effdb433e3e2fafd98932fd.23	2	x	x			x	x			x		x		x
Differential calculus	ECSCS.li2O.24783dd7cc4ac0cafa1b4a631f89e345.23	2	x	x		x	x	x			x		x		x
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.300ee33abb9652455b508d9d45af9e79.23	3									x				
Physics II	ECSCS.li4O.b7a2fffbc9cd3de32f129c4482c3144a.23	3	x								x		x		
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.5a3c75c8fac2b5a0783ceb3b9c7d9c98.23	3									x				
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.9a331200fa654c821d96ad5434aa09a8.23	3									x				

Subject	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A	P6S_UO_A	P6S_UU_A	P6S_UW_A_Inz_01	P6S_UK_A	P6S_UW_A_Inz_02	P6S_KR_A	P6S_KO_A	P6S_KK_A
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.2792ec57b99b0f28f75f1125b9839b34.23	3									x				
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li4O.3c852f86c53eb5f1f214c902c1d613d0.23	3									x				
Physics lab	ECSCS.li4O.37bcdb9baedab585ebddaa360ff65cd3.23	3	x				x	x					x		
Object oriented programming	ECSCS.li4O.f30a24686c3e538a20d6893f38490a0a.23	3	x	x			x	x	x	x	x	x		x	x
Databases I	ECSCS.li4O.56fff4b7990dab877d307b8e7162bfe8.23	3	x				x					x			
Operating Systems	ECSCS.li4O.76cff58f85a90981008842c821b82002.23	3		x			x	x				x			x
Introduction to Computer Graphics	ECSCS.li4O.21b5f11441d4bb6a2f6ec78a7ae497a3.23	3	x	x			x					x		x	x
AGH UST International Courses Elective Module sem 4	ECSCS.li8O.3e128b1656d7f7e4847596a9954ce907.23	4	x	x			x			x		x			
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.643f4f5964a211a7f803d34132079fa3.23	4									x				
Network Society & Technology	POGJOS.A200000O.a7c76f59f555e3215d634878b698ddcc.23	22													
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.143e7db5678a2d393271a64a452dac7c.23	4									x				
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.li8O.ef4b74e20166ac972af4bb4a15c9afae.23	4									x				

Subject	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A	P6S_UO_A	P6S_UU_A	P6S_UW_A_Inz_01	P6S_UK_A	P6S_UW_A_Inz_02	P6S_KR_A	P6S_KO_A	P6S_KK_A
Optical Fibers - Technology and Applications	POGJOS.A100000O.e50956f566d74e42860bbbb0c11e1e6c.23	21													
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii8O.8f67b761b206666bcb89425b613b4241.23	4									x				
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	ECSCS.Ii8O.e59199a0d131cbf1fcb2df06288246bc.23	4									x				
Distributed Control Systems	POGJOS.A100000O.e5389bc4a8d9e5d2898e87e52124e831.23	21													
Databases II	ECSCS.Ii8O.692f9176145819252abe0933a6efa804.23	4	x	x			x			x		x			
Innovation for Engineers: Design Thinking and Business Model Generation	POGJOS.A200000O.acd3c14b2af485d387332c294de1684b.23	22													
Technology in Society	POGJOS.A100000O.8008664454b75ee55bb5458aeddce404.23	21													
Fundamentals of Data Science	POGJOS.A200000O.631dd7c4949d7680f11db9c8258044c7.23	22													
Fundamentals of Optimization	POGJOS.A200000O.777bddd8543130c93a829f73a1bd03a2.23	22													
Basics of Design in SolidWorks 3D CAD Software	POGJOS.A100000O.ce7ffcde3328545e011bec9d6b6b3482.23	21													
Introduction to Geoinformatics	POGJOS.A200000O.2ccd602bd84cf5fd5410279a98aaa3e5.23	22													
Python in Engineering Calculations	POGJOS.A100000O.d19a2814acf928b4d00bd879d5d64278.23	21													
Python Language	ECSCS.Ii78O.0ca57dd01071a89e81fe5d3559bc5b5a.23	4 lub 5 lub 6 lub 7	x	x			x	x	x			x			
Software studio I	ECSCS.Ii8O.e0f77194fa95f5912cb9fe847a4726d5.23	4	x	x	x	x	x	x	x	x			x		

Subject	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A	P6S_UO_A	P6S_UU_A	P6S_UW_A_Inz_01	P6S_UK_A	P6S_UW_A_Inz_02	P6S_KR_A	P6S_KO_A	P6S_KK_A
Computer Networks	ECSCS.li8O.ddf71bd4a5b4ae28ab58253386e78e12.23	4		x			x			x		x			
Software Engineering	ECSCS.li8O.fca68aa1669c18f1464740d731a256e4.23	4	x	x			x	x		x		x		x	x
AGH UST International Courses Elective Module sem 5	ECSCS.li10O.882c8713a57ce291031a0d06f0c228d6.23	5	x	x			x			x		x			
Formal Languages and Compilers	ECSCS.li10O.fb9f7823c541196383b3b52dfc91b4c8.23	5	x	x			x					x			x
Introduction to Artificial Intelligence	ECSCS.li10O.8668bac069f74b284f5cce3a7a3dee12.23	5		x						x				x	
Software studio II	ECSCS.li10O.444eab118568829c0819cc1b5259de6f.23	5	x	x			x	x	x	x			x	x	x
Introduction to the Semantic Web and Knowledge Graphs	ECSCS.li30O.6077f53df2e8d.23	5 lub 6		x			x	x		x				x	x
Introduction to Process Mining	ECSCS.li10O.6077f3a31ec00.23	5	x	x			x			x	x	x		x	
Introduction to Programming Language Theory	ECSCS.li50O.6077f40e8e59f.23	5 lub 7	x	x			x			x		x		x	x
Constraint Programming	ECSCS.li50O.6245fa382b339.23	5 lub 7	x	x			x			x		x	x		
Logic Programming	ECSCS.li50O.624614f2f0150.23	5 lub 7	x	x			x		x	x		x			
Graphical Programming Languages	ECSCS.li50O.6246131d0da95.23	5 lub 7	x	x			x	x				x	x		x
Digital Electronics and Microprocessors	ECSCS.li10O.cfb642ae2d5ae1ae377ed0a319e6f6e5.23	5		x			x	x				x			
AGH UST International Courses Elective Module sem 6	ECSCS.li20O.2d028e347ea3c824fc2410a5a1749d82.23	6	x	x			x			x		x			

Subject	Code	Semestr	P6S_WG_A	P6S_WG_A_Inz	P6S_WK_A	P6S_WK_A_Inz	P6S_UW_A	P6S_UO_A	P6S_UU_A	P6S_UW_A_Inz_01	P6S_UK_A	P6S_UW_A_Inz_02	P6S_KR_A	P6S_KO_A	P6S_KK_A
Cybersecurity	ECSCS.li20O.e743fe8ce7708ddbc0f9bded2d81e2b0.23	6	x	x			x		x	x		x		x	x
Web Application Technologies	ECSCS.li20O.48d365d31d17f6a0ba19f2e562e7e8da.23	6		x			x	x	x						x
Embedded systems	ECSCS.li20O.228078523cb7f097ecc55879565d142c.23	6		x			x					x		x	
Professional practice	ECSCS.li20O.557aa2c67bc9c194cb3ea1eac55ffe27.23	6					x	x	x	x		x	x	x	
Human-Computer Interaction	ECSCS.li20O.6077f3db7a765.23	6		x	x		x	x		x			x	x	x
AGH UST International Courses Elective Module sem 7	ECSCS.li40O.0e37c8e8db3d7d44ada69f5bba6ba5b4.23	7	x	x			x			x		x			
Final Project	ECSCS.li40O.b2d85c6445cb4ca1ad39313aa3034376.23	7	x	x	x	x	x	x	x	x	x	x	x	x	x
Diploma Seminar	ECSCS.li40O.c31fbe5bec3172c3f6a1fdba22ab38ce.23	7			x		x	x					x		
Sum (obligatory):			22	25	4	5	30	21	11	13	10	18	17	11	16
Sum (elective):			10	12	2	0	13	5	3	10	16	10	4	5	5
Sum:			32	37	6	5	43	26	14	23	26	28	21	16	21

Matrix of directional learning outcomes with related forms of classes and the method of testing

Major: Computer Science

2023/2024/S/Ii/EAIiIB/CSC/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 Computer Science	Lecture, Laboratory classes	Examination, Activity during classes, Completion of laboratory classes	CSC1A_W02, CSC1A_W05, CSC1A_W03, CSC1A_U01
Introduction to Unix systems	Lecture, Laboratory classes	Activity during classes, Test, Activity during classes, Test, Completion of laboratory classes	CSC1A_W02, CSC1A_U04, CSC1A_U07
Programming Languages I	Lecture, Laboratory classes	Activity during classes, Participation in a discussion, Activity during classes, Participation in a discussion, Execution of laboratory classes, Test	CSC1A_W02, CSC1A_W03, CSC1A_U07, CSC1A_K01
Higher algebra	Lecture, Auditorium classes	Activity during classes, Examination, Activity during classes, Examination	CSC1A_W01, CSC1A_W07, CSC1A_U01, CSC1A_U02, CSC1A_U03, CSC1A_U06, CSC1A_K01, CSC1A_K03
Mathematical Analysis	Lecture, Auditorium classes	Activity during classes, Test, Examination, Activity during classes, Test, Examination	CSC1A_W01, CSC1A_W07, CSC1A_U01, CSC1A_U02, CSC1A_U03, CSC1A_U06, CSC1A_W04
Discrete mathematics	Lecture, Auditorium classes	Activity during classes, Participation in a discussion, Test, Examination, Oral answer, Activity during classes, Participation in a discussion, Test, Examination, Oral answer	CSC1A_W01, CSC1A_W04, CSC1A_K01
Elective Humanistic Course 1	Lecture	Activity during classes	CSC1A_W06, CSC1A_U01, CSC1A_U02, CSC1A_U03, CSC1A_K01, CSC1A_K02, CSC1A_K03
Elective Humanistic Course 2	Lecture	Activity during classes	CSC1A_W06, CSC1A_U01, CSC1A_U02, CSC1A_U03, CSC1A_K01, CSC1A_K02, CSC1A_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
Physics I	Lecture, Auditorium classes	Activity during classes, Participation in a discussion, Execution of exercises, Examination, Involvement in teamwork, Test results, Oral answer, Activity during classes, Execution of exercises, Test, Examination, Involvement in teamwork, Test results, Oral answer	CSC1A_W01, CSC1A_U01, CSC1A_U06, CSC1A_K01
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 1/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Algorithms and data structures	Lecture, Auditorium classes	Examination, Execution of exercises, Test, Examination	CSC1A_W02, CSC1A_W04, CSC1A_U04, CSC1A_K03, CSC1A_U05, CSC1A_U07, CSC1A_U01, CSC1A_K01
Logic in Computer Science	Lecture, Auditorium classes	Activity during classes, Test, Examination, Activity during classes, Test, Completion of laboratory classes	CSC1A_W01, CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U01, CSC1A_U02, CSC1A_U03, CSC1A_U04, CSC1A_U05, CSC1A_U06, CSC1A_U07, CSC1A_K01, CSC1A_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
Programming Languages II	Lecture, Laboratory classes	Activity during classes, Execution of laboratory classes, Test, Project, Completion of laboratory classes, Activity during classes, Execution of laboratory classes, Test, Project, Completion of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U01, CSC1A_U06, CSC1A_U02, CSC1A_U07, CSC1A_K01, CSC1A_K02, CSC1A_K03
Statistics	Lecture, Auditorium classes, Laboratory classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Activity during classes, Participation in a discussion, Execution of exercises, Execution of laboratory classes, Test, Project, Examination, Oral answer, Activity during classes, Participation in a discussion, Execution of exercises, Execution of laboratory classes, Test, Project, Examination, Oral answer	CSC1A_W01, CSC1A_W02, CSC1A_U01, CSC1A_U02, CSC1A_U06, CSC1A_K01, CSC1A_K03
Differential calculus	Lecture, Auditorium classes	Activity during classes, Examination, Activity during classes, Examination	CSC1A_W01, CSC1A_W07, CSC1A_W04, CSC1A_U01, CSC1A_U02, CSC1A_U06, CSC1A_K01, CSC1A_K03
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Physics II	Lecture, Auditorium classes	Activity during classes, Examination, Activity during classes, Examination	CSC1A_W01, CSC1A_U06, CSC1A_K01
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06

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
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 2/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Physics lab	Lecture, Laboratory classes	Execution of laboratory classes, Report, Completion of laboratory classes, Activity during classes, Execution of laboratory classes, Test, Report, Involvement in teamwork, Completion of laboratory classes	CSC1A_W01, CSC1A_U01, CSC1A_U02, CSC1A_K01
Object oriented programming	Lecture, Laboratory classes	Activity during classes, Participation in a discussion, Execution of laboratory classes, Examination, Completion of laboratory classes, Activity during classes, Participation in a discussion, Execution of laboratory classes, Examination, Completion of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_W05, CSC1A_U01, CSC1A_U03, CSC1A_U04, CSC1A_U06, CSC1A_U02, CSC1A_U05, CSC1A_U07, CSC1A_K02, CSC1A_K03
Databases I	Lecture, Laboratory classes	Activity during classes, Project, Examination, Activity during classes, Execution of a project, Execution of laboratory classes, Project, Examination	CSC1A_W03, CSC1A_U07
Operating Systems	Lecture, Laboratory classes	Test, Activity during classes, Execution of exercises	CSC1A_W02, CSC1A_U01, CSC1A_U07, CSC1A_K03
Introduction to Computer Graphics	Lecture, Laboratory classes, Project classes	Activity during classes, Test, Activity during classes, Execution of laboratory classes, Test, Activity during classes, Execution of a project	CSC1A_W02, CSC1A_W03, CSC1A_U07, CSC1A_K02, CSC1A_K03
AGH UST International Courses Elective Module sem 4	Progress evaluation and interim assignments		CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U04, CSC1A_U05, CSC1A_U07
French B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Network Society & Technology	Conversation seminar	Activity during classes, Participation in a discussion, Project, Involvement in teamwork, Presentation	

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
German B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Spanish B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Optical Fibers - Technology and Applications	Lecture	Examination	
Russian B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
English B2 course – compulsory course of 135 hours for students of FIRST-CYCLE studies – semester 3/3 (STUDY PROGRAMME IN ENGLISH)	Foreign language classes	Activity during classes, Participation in a discussion, Execution of exercises, Test, Examination, Test results, Essays written during classes, Presentation	CSC1A_U06
Distributed Control Systems	Lecture, Laboratory classes	Activity during classes, Execution of laboratory classes, Completion of laboratory classes, Execution of laboratory classes, Completion of laboratory classes	
Databases II	Lecture, Laboratory classes, Project classes	Test, Project, Test, Project, Test, Project	CSC1A_W02, CSC1A_W03, CSC1A_U04, CSC1A_U05, CSC1A_U07
Innovation for Engineers: Design Thinking and Business Model Generation	Workshop classes	Activity during classes, Project	
Technology in Society	Workshop classes	Activity during classes, Examination, Presentation	
Fundamentals of Data Science	Lecture, Laboratory classes, Project classes	Participation in a discussion, Examination, Execution of laboratory classes, Completion of laboratory classes, Execution of a project, Project, Report on completion of a practical placement, Presentation	

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
Fundamentals of Optimization	Lecture, Project classes	Examination, Project, Engineering project, Completion of laboratory classes	
Basics of Design in SolidWorks 3D CAD Software	Laboratory classes	Activity during classes, Participation in a discussion, Execution of laboratory classes, Test, Involvement in teamwork, Test results, Oral answer, Completion of laboratory classes	
Introduction to Geoinformatics	Lecture, Laboratory classes	Examination, Participation in a discussion, Completion of laboratory classes	
Python in Engineering Calculations	Laboratory classes	Activity during classes, Execution of laboratory classes, Report, Completion of laboratory classes	
Python Language	Laboratory classes	Activity during classes, Execution of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_U07, CSC1A_U01, CSC1A_U03
Software studio I	Project classes	Execution of a project, Case study, Completion of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_W07, CSC1A_W06, CSC1A_U01, CSC1A_U03, CSC1A_U04, CSC1A_U05, CSC1A_K01
Computer Networks	Lecture, Laboratory classes	Examination, Test results, Execution of laboratory classes, Test results	CSC1A_W02, CSC1A_W05, CSC1A_U04, CSC1A_U05, CSC1A_U07
Software Engineering	Lecture, Laboratory classes, Project classes	Project, Case study, Completion of laboratory classes, Project, Case study, Completion of laboratory classes, Project, Case study, Completion of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_U01, CSC1A_U02, CSC1A_U04, CSC1A_U07, CSC1A_K02, CSC1A_K03
AGH UST International Courses Elective Module sem 5	Progress evaluation and interim assignments		CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U04, CSC1A_U07
Formal Languages and Compilers	Lecture, Laboratory classes, Project classes	Test, Involvement in teamwork, Completion of laboratory classes, Test, Completion of laboratory classes	CSC1A_W01, CSC1A_W02, CSC1A_U07, CSC1A_K03
Introduction to Artificial Intelligence	Lecture, Laboratory classes	Activity during classes, Examination, Activity during classes, Test, Examination	CSC1A_W04, CSC1A_W02, CSC1A_U04, CSC1A_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
Software studio II	Project classes	Execution of a project, Project, Case study	CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U01, CSC1A_U02, CSC1A_U04, CSC1A_U05, CSC1A_U03, CSC1A_K01, CSC1A_K02, CSC1A_K03
Introduction to the Semantic Web and Knowledge Graphs	Lecture, Laboratory classes	Test	CSC1A_W02, CSC1A_U01, CSC1A_U04, CSC1A_K02, CSC1A_K03
Introduction to Process Mining	Lecture, Laboratory classes	Participation in a discussion, Test, Report on completion of a practical placement, Completion of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_U04, CSC1A_U06, CSC1A_U07, CSC1A_K02
Introduction to Programming Language Theory	Lecture, Laboratory classes	Participation in a discussion, Test, Activity during classes, Execution of a project, Involvement in teamwork, Completion of laboratory classes	CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U07, CSC1A_U02, CSC1A_U05, CSC1A_K02, CSC1A_K03
Constraint Programming	Lecture, Laboratory classes	Presentation, Completion of laboratory classes, Execution of a project, Execution of laboratory classes, Test results	CSC1A_W03, CSC1A_W04, CSC1A_U04, CSC1A_U07, CSC1A_K01
Logic Programming	Lecture, Laboratory classes	Presentation, Completion of laboratory classes, Execution of laboratory classes, Test results	CSC1A_W04, CSC1A_W03, CSC1A_U03, CSC1A_U04, CSC1A_U07
Graphical Programming Languages	Lecture, Laboratory classes	Test, Test	CSC1A_W03, CSC1A_W04, CSC1A_U01, CSC1A_U02, CSC1A_U07, CSC1A_K01, CSC1A_K03
Digital Electronics and Microprocessors	Lecture, Auditorium classes, Laboratory classes	Activity during classes, Execution of laboratory classes, Test, Report, Oral answer, Activity during classes, Execution of laboratory classes, Test, Oral answer, Activity during classes, Execution of laboratory classes, Test, Report, Oral answer	CSC1A_W05, CSC1A_U02, CSC1A_U07, CSC1A_U01
AGH UST International Courses Elective Module sem 6	Progress evaluation and interim assignments		CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U04, CSC1A_U07
Cybersecurity	Lecture, Laboratory classes, Project classes	Activity during classes, Project, Activity during classes, Participation in a discussion, Project, Presentation, Activity during classes, Participation in a discussion, Project, Presentation	CSC1A_W02, CSC1A_W03, CSC1A_U03, CSC1A_U04, CSC1A_K02, CSC1A_U05, CSC1A_U07, CSC1A_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
Web Application Technologies	Lecture, Laboratory classes, Project classes	Activity during classes, Execution of laboratory classes, Project, Examination, Activity during classes, Execution of laboratory classes, Project, Examination, Activity during classes, Execution of laboratory classes, Project, Examination	CSC1A_W02, CSC1A_U01, CSC1A_U03, CSC1A_K03
Embedded systems	Lecture, Laboratory classes, Project classes	Activity during classes, Execution of laboratory classes, Test, Activity during classes, Test, Activity during classes, Test	CSC1A_W05, CSC1A_U07, CSC1A_K02
Professional practice	Practical placement	Work done within the framework of a practical placement, Confirmation of completion of practical placement programme	CSC1A_U01, CSC1A_U02, CSC1A_U04, CSC1A_U05, CSC1A_U03, CSC1A_U07, CSC1A_K01, CSC1A_K02
Human-Computer Interaction	Lecture, Seminars	Examination, Oral answer, Participation in a discussion, Execution of a project, Essay, Case study, Presentation, Oral answer	CSC1A_W02, CSC1A_W06, CSC1A_U01, CSC1A_U02, CSC1A_U05, CSC1A_K01, CSC1A_K02, CSC1A_K03
AGH UST International Courses Elective Module sem 7	Progress evaluation and interim assignments		CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_U04, CSC1A_U07
Final Project	Diploma Thesis	Diploma thesis preparation	CSC1A_W01, CSC1A_W02, CSC1A_W03, CSC1A_W04, CSC1A_W05, CSC1A_W06, CSC1A_W07, CSC1A_U01, CSC1A_U02, CSC1A_U03, CSC1A_U04, CSC1A_U05, CSC1A_U06, CSC1A_U07, CSC1A_K01, CSC1A_K02, CSC1A_K03
Diploma Seminar	Seminars	Participation in a discussion, Diploma thesis preparation, Presentation	CSC1A_W06, CSC1A_U01, CSC1A_U02, CSC1A_K01

ECTS credits calculations

Major: Computer Science

The total number of ECTS credits the student needs to obtain in the form of:

classes conducted with the direct participation of academic teachers or other persons conducting classes	147
core science classes relevant to a given major	127
practical classes, developing practical skills, including laboratory, design, practical and workshop classes	74
classes subject to choice by the student (in the amount of not less than 30% of the number of ECTS points necessary to obtain qualifications corresponding to the level of education)	68
classes in the field of humanities or social sciences - in the case of fields of study assigned to disciplines within fields other than humanities or social sciences, respectively	5
foreign language classes	5
apprenticeships	4
classes related to the academic activity conducted at the University in the discipline or disciplines to which the field of study is assigned, in the amount greater than 50% of the number of ECTS points required to complete studies at a given level, taking into account the participation of students in classes preparing to conduct scientific activity or participate in this activity (applies only to studies with a general academic profile)	127
classes shaping practical skills in the amount greater than 50% of the number of ECTS points required to complete studies at a given level (applies only to studies with a practical profile)	

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

Major: Computer Science

Enrollment rules for the next semester

The entry rules for the next semester are defined in the AGH University regulations, taking into account the condition of the acceptable deficit of the ECTS points and conditions of the control semesters. The condition for entry into the seventh semester is the selection of the subject of engineering work.

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

The semester VII is the reference semester, which is impossible to enter with any ECTS deficit. In addition, at the EAIiIB faculty, the semester V is also the reference semester, for which it is not possible to enter with a deficit of ECTS points from the 1st-year courses (from semesters I and II).

ECTS credits debt ceiling

15

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)

With the consent of a dean, it is possible to implement selected modules of classes in the so-called blocks of classes.

Monitoring semesters

5,7

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

Student can get permission to study according to an individual study program, including a study plan. In the application, the student should present his qualifications to undertake such studies, interests, and motivations. The student may also indicate a scientific and didactic supervisor who will exercise substantive supervision over the student's individual program and plan. A requirement for undertaking studies according to an individual study program, including a study plan in the scope of §9 para. 2.1-2.3 of the Regulations of the AGH University, is to pass the first year without an ECTS points deficit and to obtain an average grade from the previous course of studies not lower than 4.7 (in the case of students who start studies qualify for the program promoting the best candidates for AGH). In the case of an individual study program only within the scope of §9 para. 2.4 and 2.5 of the Regulations of the AGH University (change of the schedule of classes and credits), not changing the semester curriculum, the research and teaching supervisor is not required.

Details on the rules for completing studies according to an individual study program including the study plan at the Faculty of Electrical, Automation, Computer Science and Biomedical Engineering are set out in Resolution No. 142/rw/2017 of the Council of the Faculty.

Implementation of apprenticeships including monitoring system and completion rules

The appointed Dean’s Plenipotentiary for student internships supervises the course of the internship process. The Plenipotentiary manages the process of concluding agreements between the Faculty and the company, as well as assesses and approves student internships.

Rules of elective modules taking

In semesters 4-7, a student should choose ICT related elective courses from the university-wide offer of the AGH UST International Courses base. Courses to choose for the student will be limited to these courses that are not implemented as part of the compulsory program and were not included in the previous semesters by the student.

Rules of study paths, diploma paths, specialty choice/eligibility

Due to a large number of elective subjects, the program does not envisage learning paths. However, in general, the decision on assigning a given student to the learning path is made by a Deputy Dean based on a student's declaration, the average from studies, as well as additional activities such as activities in scientific circles, research projects, etc.

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

The rules for the diploma procedure are specified in the Regulations of the AGH University. Additional regulations are introduced by the decision of the Dean of the Faculty No. 9/2018, which discusses in detail the rules of conducting the diploma dissertation at the faculty. Current information on the diploma exam and diploma theses can be found on the faculty website:
https://www.eaiib.agh.edu.pl/studia,egzamin-dyplomowy.html

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

The graduation result is a weighted average of the following grades:
1) the average grade of the whole degree programme (0.6),
2) the final grade of the diploma thesis (0.2),
3) the diploma examination grade (0.2).
The diploma examination covers:
1) a presentation of the diploma thesis;
2) a discussion over the diploma thesis;
3) verification of student's knowledge and skills within the scope of Computer Science studies.
The verbal descriptor of grades are determined depending on the numeric value:
1) from 3,00 verbal descriptor: dostateczny (3.0) [Polish equivalent of satisfactory],
2) from 3,21 verbal descriptor: plus dostateczny (3.5) [Polish equivalent of satisfactory plus],
3) from 3,71 verbal descriptor: dobry (4.0), good [Polish equivalent of good],
4) from 4,21 verbal descriptor: plus dobry (4.5) [Polish equivalent of good plus],
5) from 4,71 verbal descriptor: bardzo dobry (5.0) [Polish equivalent of very good]

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

After graduating from these studies, it is possible to continue education at the second-cycle (graduate) level in related fields (currently AGH University offers one Computer Science specialization in English: Systems Modeling and Data Analysis).