



Study programme

Major: Geophysics

Specialty: Applied geophysics

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General characteristics of the major

Basic information

Faculty name:	Faculty of Geology, Geophysics and Environmental Protection
Major name:	Geophysics
Specialty name:	Applied geophysics
Level:	Second-cycle (engineer) programme
Profile:	General academic
Form:	Full-time studies
ISCED classification:	
Number of ECTS credits necessary to complete studies at a given level:	90
Professional title awarded to graduates:	magister inżynier
Cycle start date:	2022/2023, summer semester
Duration of studies (number of semesters):	3

Field of science to which the major is assigned:

Field of the exact and natural sciences

Discipline of science to which the major is assigned:

Discipline	Percentage	ECTS
Earth sciences and the environment	100%	90

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

The mission of the AGH University Science and Technology in Krakow involves educating students in the fields of critical importance to the economy based on knowledge, which are essential for a dynamic and sustainable development of the country and Europe. This strategy is to continually improve the level of education, while adapting it to the current requirements of the labor market. The directions of critical importance to the economy include the direction of Geophysics. This branch of science deals with, inter alia, engineering projects aimed at prospecting deposits, geological environment monitoring, geotechnical testing ground conditions as well as the study of mass movements.

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 acquired knowledge of the application of geophysical methods allows graduates of the Applied Geophysics to use these methods for exploratory and engineering tasks. In addition, graduates are able to design and perform geophysical surveys for the assessment of natural hazards and induced by human activities, in particular threats associated with obtaining energy and raw materials. An additional skill is the planning and implementation of geophysical monitoring of the environment in time and space.

Graduates are prepared to work in geophysical, geological and mining enterprises. They also have qualifications allowing them to undertake research in higher schools, scientific and research institutes and other development units. In addition, they are prepared to undertake third-degree studies (PhD studies) due to the fact that they have mathematical-physical and IT knowledge to the extent that they allow creative work.

Graduates of both degrees of Applied Geophysics will find employment in companies with geophysical, geological and

mining profile. They can work independently in the field by carrying out measuring work. They can also work as system designers for the processing and interpretation of geophysical and geological-mining data. In addition, they can work in geophysical observatories and operate seismometric networks in hard coal and copper mines. As people with a good knowledge of exact sciences and IT tools, they can also work in other institutions requiring higher technical education.

Learning paths - scope in Polish and in English

- Do not occur (PL)
- Do not occur (EN)

Diploma paths - scope in Polish and in English

The names of the specialties in Polish and in English

Name [pl]	Name [en]
Applied geophysics	Applied Geophysics

General information about the study programme

Major: Geophysics
Specialty: Applied geophysics

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

Geophysics covers a broad range of earth science and offers a variety of options. Our graduates might find job in different branches of geophysics, e.g:

exploration geophysics
engineeringGeophysics
environmentalGeophysics

end work as:

acquisition geophysicists
petroleum geophysicists
mining geophysicists
environmental geophysicists
petrophysicists
seismologists

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

The Faculty of Geology and Geophysics cooperates with the Career Office of the AGH - UST, which prepares annual reports, the conclusions of which are taken into account in the program changes. Changes in the programs are also consulted with the faculty student self-government.

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 Faculty of Geology, Geophysics and Environmental Protection obtained institutional accreditation with distinction.

Information on including examples of good practice in the study program

The study program envisages the implementation of education modules based on certified and licensed geophysical data processing systems that are used in the oil, mining and geophysical industry (Techlog, Promax, Hampson-Russell, Petrel, etc.).

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

Representatives of the Department conduct monitoring of job fairs organized by AGH-UST and other universities as well as external entities. Applications regarding potential employment opportunities in enterprises seeking employees are included in the study program. Cooperation agreements with private companies (eg BAARS, Geod) and local administration authorities (Limanowa, Sławków, and Olkusz Communes) and national (Regional Water Management Authority in Krakow, Regional Directorate for Environmental Protection in Bydgoszcz) are signed. During negotiations of these agreements, the subject of expectations of these entities as future potential employers in relation to the Faculty's graduates is discussed. Thanks to direct contacts of Faculty employees with graduates from previous years, information, opinions and suggestions regarding trends in the geological-resource, geotechnical and hydrogeological industry are obtained. The Department also offers employment offers for graduates, or offers for paid internships for graduates and students. All requirements contained in these offers are taken into account when formulating the study program or modifying the programs of individual subjects.

Duration, rules and form of the apprenticeship

No compulsory apprenticeships are planned in the second-cycle studies.

Admission criteria, rules and policies

Major: Geophysics

Specialty: Applied geophysics

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

The candidates should have general knowledge in the natural sciences and the skills to use it in their work and life with the legal and ethical principles. The candidates should understand and analyze the processes that take place in nature, and the human impact on the environment. They should know the basic technological issues relevant to geophysics and they should regard the principles of sustainable development. The candidates should have the skills that allow them active participation in the team work, perform the assigned tasks, and using of professional literature. They should have the ability to conduct laboratory and field work and organize safe and efficient operating positions of such work. They also should demonstrate knowledge of English at level B2 of the European Framework of Reference for Languages.

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

The rules and conditions of recruitment are set out in Resolution No. 97/2019 of the AGH UST Senate of June 26, 2019 on the conditions, procedure and start and end date of recruitment for the first year of first- and second-cycle studies in the academic year 2020/2021.

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: 10

Maximum number of students: 30

Learning outcomes

Major : Geophysics
Specialty: Applied geophysics

Knowledge

KEU symbol	Directional learning outcomes	CEU symbol
GF12A_W01	The graduate knows and understands the complex physical phenomena and natural processes that apply in geophysics	P7S_WG_A
GF12A_W02	The graduate has knowledge and understands advanced mathematical, statistical and computational methods required for description of the complex geophysical problems	P7S_WG_A
GF12A_W03	The graduate has advanced knowledge in the field of earth sciences	P7S_WG_A
GF12A_W04	The graduate has extensive specialist knowledge in the field of general and applied geophysics	P7S_WG_A, P7S_WG_A_Inz
GF12A_W05	The graduate has the knowledge enabling description and analysis of geophysical parameters in the context of determining the physical properties of rocks and the dynamics of natural processes taking place.	P7S_WG_A
GF12A_W06	The graduate has knowledge about modern geophysical techniques and specialized software	P7S_WG_A, P7S_WG_A_Inz
GF12A_W07	The graduate has the knowledge necessary to solve a simple and reverse task in geophysics	P7S_WG_A
GF12A_W08	The graduate has knowledge related to the design and conduct of geophysical research in complex geological conditions related to natural, induced and anthropogenic hazards	P7S_WG_A, P7S_WG_A_Inz, P7S_WK_A_Inz
GF12A_W09	The graduate knows the methodology and specialized tools for data processing field and laboratory measurements using specialized computational tools	P6S_WG_A_Inz, P7S_WG_A
GF12A_W10	The graduate understands the principles and methodology of analyzing and interpreting geophysical data using specialized software	P7S_WG_A
GF12A_W11	The graduate has knowledge about the method of acquiring and accounting for funds needed to design and carry out geophysical surveys	P7S_WK_A, P7S_WK_A_Inz
GF12A_W12	The graduate knows the basic health and safety rules that apply when conducting field and laboratory work	P7S_WK_A
GF12A_W13	The graduate has knowledge in the field of intellectual property and patent law management	P6S_WG_A_Inz, P7S_WK_A
GF12A_W14	The graduate has general knowledge in the field of management and running a business	P7S_WK_A, P7S_WK_A_Inz

Skills

KEU symbol	Directional learning outcomes	CEU symbol
GF12A_U01	The graduate can acquire, from literature and electronic sources, advanced knowledge in the field of natural sciences and extensive specialist knowledge in the field of general and applied geophysics	P7S_UW_A
GF12A_U02	The graduate has theoretical knowledge and the ability to describe and analyze geophysical parameters measured in a variety of methods in the aspect of the diversification of physical properties of rocks and the dynamics of physical processes	P7S_UW_A

KEU symbol	Directional learning outcomes	CEU symbol
GF12A_U03	The graduate uses modern systems for processing and interpretation of geophysical data, can design new modules in systems for advanced processing and interpretation	P7S_UW_A_Inz_01, P7S_UW_A
GF12A_U04	The graduate has the ability to select the geophysical methods to solve the task	P7S_UW_A_Inz_01, P7S_UW_A
GF12A_U05	The graduate will design and carry out geophysical measurements in all methods	P7S_UW_A_Inz_01, P7S_UW_A, P7S_UW_A_Inz_02
GF12A_U06	The graduate knows how to solve exploration problems in complex geological conditions	P7S_UW_A_Inz_01, P7S_UW_A, P7S_UW_A_Inz_02
GF12A_U07	The graduate will design, perform and interpret geophysical research for the assessment of natural hazards and induced by human activity	P7S_UW_A_Inz_01, P7S_UW_A, P7S_UW_A_Inz_02
GF12A_U08	The graduate can plan, perform and interpret geophysical monitoring of the state of the environment in time and space	P7S_UW_A_Inz_01, P7S_UW_A, P7S_UW_A_Inz_02
GF12A_U09	The graduate is able to assess and usefulness of the latest solutions used in: geophysical research, trends in apparatus development, measurement techniques and specialized software	P7S_UW_A_Inz_01, P7S_UW_A
GF12A_U10	The graduate has the ability to independently design the implementation and conduct interpretation of field and laboratory geophysical measurements	P7S_UW_A_Inz_01, P7S_UW_A, P7S_UW_A_Inz_02
GF12A_U11	The graduate can correctly interpret the obtained results of research coming from various sources and on this basis provide a comprehensive mapping of the physical properties of the center	P7S_UW_A_Inz_01, P7S_UW_A
GF12A_U12	The graduate has the ability to conduct independent interpretation of geophysical measurements using simulation and statistical results	P7S_UW_A_Inz_01, P7S_UW_A
GF12A_U13	The graduate uses economic instruments to design and carry out geophysical surveys	P7S_UU_A, P7S_UW_A_Inz_01
GF12A_U14	The graduate is prepared to take up work wherever knowledge of general geophysics and applied at the level of basic knowledge and engineering skills is required, in particular in geophysical, mining and geological enterprises	P7S_UU_A, P7S_UW_A_Inz_01
GF12A_U15	The graduate uses a foreign language at the B2+ level	P7S_UK_A
GF12A_U16	The graduate has the ability to fluently use a foreign language to communicate and read and understand advanced texts in the field of natural sciences	P7S_UK_A, P7S_UW_A
GF12A_U17	The graduate has the ability to create detailed studies of geophysical research and short scientific publications in Polish and foreign language	P7S_UK_A
GF12A_U18	The graduate can in a clear and logical way consistently present an oral presentation of the method of solving the task in the field of geophysics in Polish and foreign language using various means for verbal communication	P7S_UK_A
GF12A_U19	The graduate can teach and educate himself and inspire others with his actions	P7S_UO_A, P7S_UU_A
GF12A_U20	The graduate can interact with other people as part of team work and take a leading role in the team	P7S_UO_A

Social competence

KEU symbol	Directional learning outcomes	CEU symbol
GF12A_K01	The graduate is ready to constantly update knowledge in the field of geophysics, earth sciences and mathematical-natural sciences and understands the need to broaden and deepen his knowledge	P7S_KK_A
GF12A_K02	The graduate is responsible for the safety of his own and other people during the implementation of engineering works and knows how to proceed in states of danger	P7S_KO_A
GF12A_K03	The graduate can think and act in an entrepreneurial way	P7S_KO_A
GF12A_K04	The graduate can determine the validity and sequence of tasks performed in the implemented project in a competent and responsible manner	P7S_KR_A

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

Major : Geophysics

Speciality: Applied geophysics

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	GFI2A_W09, GFI2A_W13
P7S_WG_A_Inz	knowledge of basic processes taking place in the life cycle of technical devices, facilities and systems	GFI2A_W04, GFI2A_W06, GFI2A_W08
P7S_WK_A_Inz	knowledge of basic principles of creating and developing various forms of individual entrepreneurship	GFI2A_W08, GFI2A_W11, GFI2A_W14

Skills

CEU symbol	Learning outcomes for qualifications including engineering competence	KEU references
P7S_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;	GFI2A_U03, GFI2A_U04, GFI2A_U05, GFI2A_U06, GFI2A_U07, GFI2A_U08, GFI2A_U09, GFI2A_U10, GFI2A_U11, GFI2A_U12, GFI2A_U13, GFI2A_U14
P7S_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	GFI2A_U05, GFI2A_U06, GFI2A_U07, GFI2A_U08, GFI2A_U10

Directional outcomes coverage matrix

Major: Geophysics

Specialty: Applied geophysics

2022/2023/S/III/GGIOS/GFI/AG

Subject	Code	Semestr	GF1A_W01	GF1A_W02	GF1A_W03	GF1A_W04	GF1A_W05	GF1A_W06	GF1A_W07	GF1A_W08	GF1A_W09	GF1A_W10	GF1A_W11	GF1A_W12	GF1A_W13	GF1A_W14	GF1A_U01	GF1A_U02	GF1A_U03	GF1A_U04	GF1A_U05	GF1A_U06	GF1A_U07	GF1A_U08	GF1A_U09	GF1A_U10	GF1A_U11	GF1A_U12	GF1A_U13	GF1A_U14	GF1A_U15	GF1A_U16	GF1A_U17	GF1A_U18	GF1A_U19	GF1A_U20	GF1A_K01	GF1A_K02	GF1A_K03	GF1A_K04								
Application of Python programming in Earth sciences	BGFIAGS.IIi1K.5b4b4e905a7b57f63af5444fe12620b4.22	1	x								x	x					x	x				x					x																					
Geoelectrical methods in structural and deposit research	BGFIAGS.IIi1S.c9f99c5555baef65d4b76dc1492276e7.22	1	x	x			x	x		x							x							x																								
Processing of Seismic Data	BGFIAGS.IIi1S.2505c9abe5d83509c14ca12ac7644eec.22	1						x			x	x							x									x																				
Advanced Statistical Methods	BGFIAGS.IIi1P.d3f2ea4eb1f723fe508048b40ced5c40.22	1	x	x				x				x					x	x						x				x																				
Diploma Training	BGFIAGS.IIi1K.f00878b72b1aae627be56073cdece963.22	1				x	x	x	x	x	x				x			x	x	x	x	x	x	x	x			x					x															
Modelling in Geophysics	BGFIAGS.IIi1S.5b9b7bc344a77d37b0fcb1fa1f3f6c0f.22	1		x			x	x		x	x	x						x	x	x																												
Law in mining and geology	BGFIAGS.IIi1K.b70c5f0e622ae7f8d4d2587664568c3e.22	1													x	x	x																															
Structural imaging	BGFIAGS.IIi1S.9cea7176d0540dd03f18d72d7844c162.22	1			x	x		x	x			x						x							x	x	x																					
Legal protection of intellectual property	BGFIAGS.IIi2HS.29c1249065989336fe628a51d062e438.22	2													x		x																															
Engineering seismic	BGFIAGS.IIi2S.6421c8b81bc80e13c729a5b3b3f90db2.22	2	x				x	x		x								x							x																							
Seismology And Mining Seismometry	BGFIAGS.IIi2S.e8cecf245425236318fd72ba46eef64a.22	2	x								x		x									x	x																									

Subject	Code	Semestr	GF12A_W01	GF12A_W02	GF12A_W03	GF12A_W04	GF12A_W05	GF12A_W06	GF12A_W07	GF12A_W08	GF12A_W09	GF12A_W10	GF12A_W11	GF12A_W12	GF12A_W13	GF12A_W14	GF12A_U01	GF12A_U02	GF12A_U03	GF12A_U04	GF12A_U05	GF12A_U06	GF12A_U07	GF12A_U08	GF12A_U09	GF12A_U10	GF12A_U11	GF12A_U12	GF12A_U13	GF12A_U14	GF12A_U15	GF12A_U16	GF12A_U17	GF12A_U18	GF12A_U19	GF12A_U20	GF12A_K01	GF12A_K02	GF12A_K03	GF12A_K04									
Geophysical analyzes in environmetal protection	BGFIAGS.IIi2S.21a4813832bd3e2500262bacd0318358.22	2	x	x	x			x	x	x	x	x	x					x	x	x	x	x	x	x	x		x	x																					
Rock Physics	BGFIAGS.IIi2S.3d62937f2de9ff980c5ec416268a1a7d.22	2	x	x	x	x	x	x			x	x					x	x	x	x		x					x													x									
Processing And Interpretation Of Well Logging Data	BGFIAGS.IIi2S.45877798cce584fb3e8faf3e7a6b648e.22	2						x			x	x																x		x										x	x								
Potential methods	BGFIAGS.IIi2S.0e7771d37f7a40e321a91f6903cac111.22	2	x	x	x	x		x	x	x	x		x						x	x			x							x										x		x							
Engineering geoelectric	BGFIAGS.IIi2S.1945a7b0e07858810012ca27fb7f9609.22	2	x				x	x		x							x					x						x	x										x	x		x							
Comprehensive interpretation of geophysical data	BGFIAGS.IIi4S.642d1b833cf1c0c3da2e249f75bdc39a.22	3		x		x	x	x				x					x	x	x			x				x		x	x		x												x						
Economic aspects of geophysical research	BGFIAGS.IIi4HS.a29105fd78d1b47d108c885a9561c496.22	3						x	x	x						x			x			x																				x							
Geophysical monitoring	BGFIAGS.IIi4S.0f09ca40fccdc8bb921d496074b0491.22	3	x				x	x	x	x							x			x					x	x	x	x														x							
Elective module from AGH UST International Courses Base	BGFIAGS.IIi4HS.fc7f72fd29a2ee7426a9bfd038504983.22	3																																															
Geological interpretation of geophysical measurement	BGFIAGS.IIi4S.b9db2da406be2fed9ff4a00fc3050141.22	3					x		x	x	x	x									x																							x					
Reservoir Geophysics	BGFIAGS.IIi4S.2dc8074d4181264ea986969d339cd0af.22	3				x	x		x			x						x		x						x		x																x					
Diploma Thesis	BGFIAGS.IIi4K.020527eb79105d40153428d063969161.22	3	x			x	x	x	x	x	x								x	x	x	x	x	x	x	x	x	x	x															x	x				
Diploma Seminar	BGFIAGS.IIi4K.113e607328fe3b1feac36d5c37a13bcd.22	3											x		x	x		x								x		x	x															x	x				
Sum (obligatory):			9	8	4	6	8	14	6	8	10	9	5	2	3	2	8	7	10	6	5	6	4	5	8	5	7	7	3	6	2	1	4	1	3	5	9	3	5	11									
Sum (elective):			1	0	0	1	3	2	4	3	1	2	0	0	0	1	1	1	0	4	0	1	0	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0					

Subject	Code	Semestr	GF12A_W01	GF12A_W02	GF12A_W03	GF12A_W04	GF12A_W05	GF12A_W06	GF12A_W07	GF12A_W08	GF12A_W09	GF12A_W10	GF12A_W11	GF12A_W12	GF12A_W13	GF12A_W14	GF12A_U01	GF12A_U02	GF12A_U03	GF12A_U04	GF12A_U05	GF12A_U06	GF12A_U07	GF12A_U08	GF12A_U09	GF12A_U10	GF12A_U11	GF12A_U12	GF12A_U13	GF12A_U14	GF12A_U15	GF12A_U16	GF12A_U17	GF12A_U18	GF12A_U19	GF12A_U20	GF12A_K01	GF12A_K02	GF12A_K03	GF12A_K04
Sum:			10	8	4	7	11	16	10	11	11	11	5	2	3	3	9	8	10	10	5	7	4	6	10	6	9	7	3	6	2	1	4	1	3	5	12	4	5	11

Characteristics matrix of learning outcomes in relation to modules

Major: Geophysics

Speciality: Applied geophysics

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Subject	Code	Semestr	Learning Outcomes													
			P7S_WG_A	P7S_WG_A_Inz	P7S_WK_A_Inz	P6S_WG_A_Inz	P7S_WK_A	P7S_UW_A	P7S_UW_A_Inz_01	P7S_UW_A_Inz_02	P7S_UU_A	P7S_UK_A	P7S_UO_A	P7S_KK_A	P7S_KO_A	P7S_KR_A
Application of Python programming in Earth sciences	BGFIAGS.IIi1K.5b4b4e905a7b57f63af5444fe12620b4.22	1	x			x		x	x	x				x		
Geoelectrical methods in structural and deposit research	BGFIAGS.IIi1S.c9f99c5555baef65d4b76dc1492276e7.22	1	x	x	x			x	x	x					x	
Processing of Seismic Data	BGFIAGS.IIi1S.2505c9abe5d83509c14ca12ac7644eec.22	1	x	x		x		x	x		x					x
Advanced Statistical Methods	BGFIAGS.IIi1P.d3f2ea4eb1f723fe508048b40ced5c40.22	1	x	x				x	x				x		x	x
Diploma Training	BGFIAGS.IIi1K.f00878b72b1aae627be56073cdece963.22	1	x	x	x	x	x	x	x	x	x	x	x	x		x
Modelling in Geophysics	BGFIAGS.IIi1S.5b9b7bc344a77d37b0fcb1fa1f3f6c0f.22	1	x	x	x	x		x	x		x		x	x	x	x
Law in mining and geology	BGFIAGS.IIi1K.b70c5f0e622ae7f8d4d2587664568c3e.22	1			x	x	x		x		x		x			
Structural imaging	BGFIAGS.IIi1S.9cea7176d0540dd03f18d72d7844c162.22	1	x	x				x	x	x				x	x	x
Legal protection of intellectual property	BGFIAGS.IIi2HS.29c1249065989336fe628a51d062e438.22	2				x	x	x								x
Engineering seismic	BGFIAGS.IIi2S.6421c8b81bc80e13c729a5b3b3f90db2.22	2	x	x	x			x	x	x					x	
Seismology And Mining Seismometry	BGFIAGS.IIi2S.e8cecf245425236318fd72ba46eef64a.22	2	x		x	x	x	x	x	x						x
Geophysical analyzes in environmetal protection	BGFIAGS.IIi2S.21a4813832bd3e2500262bacd0318358.22	2	x	x	x	x	x	x	x	x		x				
Rock Physics	BGFIAGS.IIi2S.3d62937f2de9ff980c5ec416268a1a7d.22	2	x	x		x		x	x	x	x				x	

Subject	Code	Semestr															
			P7S_WG_A	P7S_WG_A_Inz	P7S_WK_A_Inz	P6S_WG_A_Inz	P7S_WK_A	P7S_UW_A	P7S_UW_A_Inz_01	P7S_UW_A_Inz_02	P7S_UU_A	P7S_UK_A	P7S_UO_A	P7S_KK_A	P7S_KO_A	P7S_KR_A	
Processing And Interpretation Of Well Logging Data	BGFIAGS.IIi2S.45877798cce584fb3e8faf3e7a6b648e.22	2	x	x		x		x	x		x					x	x
Potential methods	BGFIAGS.IIi2S.0e7771d37f7a40e321a91f6903cac111.22	2	x	x	x	x	x	x	x	x	x					x	x
Engineering geoelectric	BGFIAGS.IIi2S.1945a7b0e07858810012ca27fb7f9609.22	2	x	x	x			x	x	x					x	x	x
Comprehensive interpretation of geophysical data	BGFIAGS.IIi4S.642d1b833cf1c0c3da2e249f75bdc39a.22	3	x	x				x	x	x	x	x	x				x
Economic aspects of geophysical research	BGFIAGS.IIi4HS.a29105fd78d1b47d108c885a9561c496.22	3	x	x	x			x	x	x	x					x	
Geophysical monitoring	BGFIAGS.IIi4S.0f09ca40fccdc8bb921d496074b0491.22	3	x	x	x			x	x	x						x	
Elective module from AGH UST International Courses Base	BGFIAGS.IIi4HS.fc7f72fd29a2ee7426a9bfd038504983.22	3															
Geological interpretation of geophysical measurement	BGFIAGS.IIi4S.b9db2da406be2fed9ff4a00fc3050141.22	3	x	x	x	x		x	x								x
Reservoir Geophysics	BGFIAGS.IIi4S.2dc8074d4181264ea986969d339cd0af.22	3	x	x				x	x							x	
Diploma Thesis	BGFIAGS.IIi4K.020527eb79105d40153428d063969161.22	3	x	x	x	x	x	x	x	x	x	x	x			x	
Diploma Seminar	BGFIAGS.IIi4K.113e607328fe3b1feac36d5c37a13bcd.22	3			x	x	x	x	x		x	x	x	x	x	x	x
Sum (obligatory):			16	14	11	13	8	18	18	12	10	6	7	9	6	11	
Sum (elective):			4	4	3	1	1	4	4	2	0	0	0	3	1	0	
Sum:			20	18	14	14	9	22	22	14	10	6	7	12	7	11	

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

Major: Geophysics

Speciality: Applied geophysics

2022/2023/S/III/GGIOS/GFI/AG

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
Application of Python programming in Earth sciences	Laboratory classes	Execution of exercises, Execution of a project, Test, Involvement in teamwork	GFI2A_W02, GFI2A_W09, GFI2A_W10, GFI2A_U03, GFI2A_U06, GFI2A_U12, GFI2A_U01, GFI2A_U20
Geoelectrical methods in structural and deposit research	Lecture, Laboratory classes	Activity during classes, Participation in a discussion, Test, Project, Activity during classes, Participation in a discussion, Test, Project	GFI2A_W05, GFI2A_W06, GFI2A_W08, GFI2A_W01, GFI2A_W02, GFI2A_U01, GFI2A_U08, GFI2A_K01
Processing of Seismic Data	Lecture, Laboratory classes	Activity during classes, Participation in a discussion, Examination, Case study, Test results, Oral answer, Activity during classes, Participation in a discussion, Execution of a project, Test, Report, Oral answer	GFI2A_W06, GFI2A_W09, GFI2A_W10, GFI2A_U03, GFI2A_U14, GFI2A_K04
Advanced Statistical Methods	Lecture, Laboratory classes	Examination, Execution of exercises, Execution of a project	GFI2A_W01, GFI2A_W02, GFI2A_W10, GFI2A_U01, GFI2A_U03, GFI2A_U12, GFI2A_W06, GFI2A_U09, GFI2A_U15, GFI2A_K01, GFI2A_K04
Diploma Training	Thesis-internship programme	Work done within the framework of a practical placement	GFI2A_W04, GFI2A_W05, GFI2A_W08, GFI2A_U04, GFI2A_U07, GFI2A_U08, GFI2A_U09, GFI2A_U13, GFI2A_W06, GFI2A_W09, GFI2A_U03, GFI2A_W07, GFI2A_U02, GFI2A_U05, GFI2A_U10, GFI2A_W12, GFI2A_U17, GFI2A_U20, GFI2A_K04
Modelling in Geophysics	Laboratory classes	Test	GFI2A_W02, GFI2A_U02, GFI2A_U19, GFI2A_W05, GFI2A_W09, GFI2A_U03, GFI2A_K04, GFI2A_W06, GFI2A_W08, GFI2A_U04, GFI2A_W10, GFI2A_U11, GFI2A_K01
Law in mining and geology	Lecture	Participation in a discussion, Test	GFI2A_W11, GFI2A_W14, GFI2A_W13, GFI2A_U13, GFI2A_U14, GFI2A_U20

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
Structural imaging	Laboratory classes	Activity during classes, Examination	GFI2A_W03, GFI2A_W04, GFI2A_W06, GFI2A_W07, GFI2A_U02, GFI2A_U09, GFI2A_U10, GFI2A_U11, GFI2A_W10, GFI2A_K01, GFI2A_K02, GFI2A_K03, GFI2A_K04
Legal protection of intellectual property	Lecture	Execution of a project, Test results	GFI2A_W13, GFI2A_U01, GFI2A_K03
Engineering seismic	Lecture, Workshop classes	Project, Scientific paper, Participation in a discussion, Project, Scientific paper	GFI2A_W01, GFI2A_W05, GFI2A_W06, GFI2A_W08, GFI2A_U01, GFI2A_U08, GFI2A_K01
Seismology And Mining Seismometry	Lecture, Laboratory classes	Participation in a discussion, Execution of laboratory classes, Test, Participation in a discussion, Execution of laboratory classes, Test	GFI2A_W01, GFI2A_W09, GFI2A_W11, GFI2A_U05, GFI2A_U06, GFI2A_K04
Geophysical analyzes in environmental protection	Auditorium classes	Test	GFI2A_W08, GFI2A_U04, GFI2A_U05, GFI2A_W06, GFI2A_W07, GFI2A_W09, GFI2A_W10, GFI2A_W01, GFI2A_W02, GFI2A_W03, GFI2A_W11, GFI2A_U06, GFI2A_U07, GFI2A_U08, GFI2A_U02, GFI2A_U03, GFI2A_U09, GFI2A_U11, GFI2A_U12, GFI2A_U17
Rock Physics	Lecture, Laboratory classes	Activity during classes, Participation in a discussion, Execution of a project, Test, Examination, Report, Activity during classes, Execution of a project, Test, Examination, Report, Report on completion of a practical placement	GFI2A_W04, GFI2A_W05, GFI2A_W07, GFI2A_W09, GFI2A_W10, GFI2A_W02, GFI2A_W01, GFI2A_W03, GFI2A_W06, GFI2A_U01, GFI2A_U02, GFI2A_U04, GFI2A_U14, GFI2A_U03, GFI2A_U06, GFI2A_U11, GFI2A_K01
Processing And Interpretation Of Well Logging Data	Laboratory classes	Execution of laboratory classes, Test	GFI2A_W06, GFI2A_W09, GFI2A_W10, GFI2A_U14, GFI2A_U12, GFI2A_K03, GFI2A_K04
Potential methods	Lecture, Laboratory classes	Activity during classes, Execution of a project, Execution of laboratory classes, Test, Project, Examination, Test results, Activity during classes, Execution of a project, Execution of laboratory classes, Test, Project, Examination, Test results	GFI2A_W01, GFI2A_W02, GFI2A_W07, GFI2A_W04, GFI2A_W06, GFI2A_W09, GFI2A_W08, GFI2A_W03, GFI2A_W11, GFI2A_U03, GFI2A_U07, GFI2A_U14, GFI2A_U09, GFI2A_U04, GFI2A_U10, GFI2A_K01, GFI2A_K04
Engineering geoelectric	Lecture, Workshop classes	Participation in a discussion, Project, Activity during classes, Participation in a discussion, Project, Involvement in teamwork	GFI2A_W01, GFI2A_W05, GFI2A_W06, GFI2A_W08, GFI2A_U01, GFI2A_U05, GFI2A_U10, GFI2A_U11, GFI2A_K02, GFI2A_K04, GFI2A_K01

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
Comprehensive interpretation of geophysical data	Laboratory classes	Activity during classes, Participation in a discussion, Execution of a project, Project, Involvement in teamwork	GFI2A_W06, GFI2A_W10, GFI2A_U03, GFI2A_U09, GFI2A_U11, GFI2A_W02, GFI2A_W04, GFI2A_U01, GFI2A_U17, GFI2A_W05, GFI2A_U14, GFI2A_U02, GFI2A_U06, GFI2A_U12, GFI2A_U20, GFI2A_K04
Economic aspects of geophysical research	Lecture, Workshop classes	Activity during classes, Examination, Activity during classes, Case study	GFI2A_W14, GFI2A_W06, GFI2A_W07, GFI2A_W08, GFI2A_U04, GFI2A_U06, GFI2A_K01
Geophysical monitoring	Lecture, Laboratory classes	Participation in a discussion, Project, Participation in a discussion, Test, Project	GFI2A_W01, GFI2A_W05, GFI2A_W06, GFI2A_W07, GFI2A_W08, GFI2A_U01, GFI2A_U04, GFI2A_U08, GFI2A_U09, GFI2A_U10, GFI2A_U11, GFI2A_K01
Elective module from AGH UST International Courses Base	Lecture		
Geological interpretation of geophysical measurement	Workshop classes	Activity during classes, Case study	GFI2A_W07, GFI2A_W08, GFI2A_W09, GFI2A_W10, GFI2A_W05, GFI2A_U04, GFI2A_K02
Reservoir Geophysics	Lecture, Project classes	Participation in a discussion, Execution of exercises, Scientific paper, Participation in a discussion, Execution of exercises, Scientific paper	GFI2A_W04, GFI2A_W05, GFI2A_W07, GFI2A_W10, GFI2A_U09, GFI2A_U02, GFI2A_U04, GFI2A_U11, GFI2A_K01
Diploma Thesis	Diploma Thesis	Diploma thesis preparation	GFI2A_W01, GFI2A_W04, GFI2A_W05, GFI2A_W06, GFI2A_W07, GFI2A_W08, GFI2A_W09, GFI2A_U03, GFI2A_U04, GFI2A_U05, GFI2A_U06, GFI2A_U07, GFI2A_U08, GFI2A_U09, GFI2A_U10, GFI2A_U13, GFI2A_U12, GFI2A_U17, GFI2A_U18, GFI2A_W12, GFI2A_U19, GFI2A_U20, GFI2A_K02, GFI2A_K03
Diploma Seminar	Seminars	Activity during classes, Participation in a discussion, Scientific paper, Diploma thesis preparation, Presentation	GFI2A_W13, GFI2A_W11, GFI2A_W14, GFI2A_U09, GFI2A_U11, GFI2A_U16, GFI2A_U02, GFI2A_U12, GFI2A_U15, GFI2A_U19, GFI2A_K04, GFI2A_K01, GFI2A_K03

ECTS credits calculations

Major: Geophysics

Specialty: Applied geophysics

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	68
core science classes relevant to a given major	51
practical classes, developing practical skills, including laboratory, design, practical and workshop classes	45
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)	6
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	6
foreign language classes	5
apprenticeships	0
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)	63
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)	0

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

Major: Geophysics

Specialty: Applied geophysics

Enrollment rules for the next semester

- The student receives an entry for the next semester, if he obtained the number of ECTS points assigned to this semester in the current semester (27-33).
- Passing the semester of studies and confirmation of getting an entry for the next semester of study is made in the University's ICT system no later than one week from the beginning of the next semester of study.
- The condition for passing the last semester of studies is obtaining the credit for all obligatory modules of classes included in the plan of this semester of studies, with the exception of the diploma thesis.

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

If the number of ECTS points assigned to a given semester is not obtained, the student may apply for entry for the next semester of studies with the so-called "Acceptable total deficit of points". The application in this case should be submitted to the Dean of the Faculty before the beginning of the semester concerned.

ECTS credits debt ceiling

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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)

The electivity is carried out by selecting individual modules of classes in semesters II and III. These are modules for humanities, engineering, which allow for better adjustment of the program to the interests of students, but also allow to meet the requirements in the education of geophysical engineers.

Monitoring semesters

none

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

An individual study program, including a study plan, may be awarded to the student:

- completed at least the first semester of study and obtained an average with not less than 4.25;
- a disabled person;
- being in a difficult life situation;
- participating in sports competitions at the national or international level;
- wanting to complete part of the studies at another university;
- studying in more than one field of study;
- elected to the collegial body of the University;
- a foreigner taking a Polish language course.

Individualization of the study program, including the study plan, may consist of:

- individual selection of modules of classes, methods and forms of education. In this case, the Dean appoints a guardian (IPS) from among the Faculty employees with a doctorate degree at least.
- modification of the form of credit and exams.

Individualization of the study program, including the study plan, may relate to classes within one or several semesters or the whole course of study, but it may not lead to changes in the directional learning outcomes or to extend the date of completion of studies.

Implementation of apprenticeships including monitoring system and completion rules

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Rules of elective modules taking

Depending on the elective module, it is activated on the basis of the minimum number of applications allowed.

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

During registration in the recruitment system for second-degree studies, the candidate indicates the specializations on which he would like to take up education (so-called list of preferences) from the list presented by the Dean. Specialties on this list (at least two) should be ranked by the candidate in order from the most to the least desirable. The qualification for particular specialties is based on the recruitment rate (W), which depends on the result of the entrance / directional examination and the average grade from the first-cycle studies. On this basis, ranking lists of particular specialties are created. The Dean decides on the limits of places on specialties, taking into account the possibility of diplomacy in individual cathedrals, the number of persons qualified for the second-cycle studies, declarations of candidates submitted during recruitment and the financial situation of the faculty. If, due to the lack of a sufficient number of candidates, a decision is made by the Dean not to start education in a given specialty, the candidates who indicated it in the first place will be included in the ranking lists of specializations indicated in the second place.

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

1. The condition for obtaining a diploma of completion of the second-cycle studies at full-time studies at AGH-UST, in the field of applied geophysics, is the total fulfillment of the conditions:

- passing all the modules of classes provided for in the curriculum,
- preparation of the thesis (master's thesis),
- passing the second degree (master's) diploma exam consisting of a general directional exam, presentation of the diploma thesis and discussion on it (defense of thesis),

2. The topic of the diploma thesis is selected before the end of the first semester.

The diploma thesis is evaluated by the supervisor / supervisor of the work and the reviewer, at least one of whom holds at least the postdoctoral degree.

3. A student who has completed all the study modules provided for in the curriculum may be admitted to the general final examination.

The general second degree examination takes place in written form and includes knowledge in the field of specialization. 4 questions will be drawn from a set of 60 questions divided into 4 thematic groups (one from each group). From among randomly drawn questions, the student chooses 3 and the answers to these questions are subject to evaluation in accordance with the rules set out in the Regulations of the AGH University of Science and Technology. The exam takes place according to the schedule presented by the Dean no later than 30 days before the planned date of the exam. The schedule includes a basic deadline and one correction term. Issues and examples of questions will be made available to students no later than 30 days before the date of the general directional examination. In the case of receiving a negative assessment (the arithmetic average of the answers to questions below 50%) from the general examination at the basic and correctional dates or failing to pass this examination, the dean deletes the student from the student list.

4. Defense of diploma theses is conducted in Departments in front of committees appointed by the Faculty Dean.

Only the diploma thesis, which was positively evaluated by the supervisor and the reviewer, registered in the dean's office no later than 5 days before the planned defense, and the contractor passed the general directional examination and submitted all the required documents can be accepted for defense.

The defense consists of the overt part, during which the author presents the work and discussion about the work and the secret part (without the participation of the student) during which the committee evaluates the presentation of the work and discussion, and then calculates the final grade of the second-degree diploma exam and places it in the diploma examination of the second degree.

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

The overall result of graduation is calculated as a weighted average:

- a) average grade from studies, calculated in accordance with the Study Regulations (with a weight of 0.6);
- b) the final evaluation of the diploma thesis, which is the arithmetic average of the work grades issued by the promoter and reviewer, determined in accordance with the Study Regulations (with a weight of 0.2);
- c) assessment of the master thesis exam determined by the commission, which is the arithmetic average of the general examination exam and the presentation of the master thesis and answers to questions related to the work, in accordance with the Study Regulations (with a weight of 0.2), with each of these parts, the student must get a positive grade (at least 3.0).

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

Entry for the diploma semester is possible after completing all the modules provided for the first and second semesters, in accordance with the regulations of the AGH-UST study.