Study programme

Major: Oil and Gas Engineering

Specialty: Petroleum Engineering

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General characteristics of the major

Basic information

Faculty name:	Faculty of Drilling, Oil and Gas
Major name:	Oil and Gas Engineering
Specialty name:	Petroleum Engineering
Level:	Second-cycle (engineer) programme
Profile:	General academic
Form:	Full-time studies
ISCED classification:	0724
Number of ECTS credits necessary to complete studies at a given level:	90
Professional title awarded to graduates:	magister inżynier
Cycle start date:	2021/2022, summer semester
Duration of studies (number of semesters):	3

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
Environmental engineering, mining and energy	100%	90

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

The mission of the AGH University of Science and Technology involves students education at faculties as key importance for the knowledge-based economy; in other words, in directions that are necessary for the further proper development of the country and Europe. Such fields of study includes Oil and Gas Engineering. The course is aimed to educate graduates with high professional qualifications, ready to meet the requirements of an MSc in Engineering both in the region, in Poland and in other countries in Europe and the world. University's Development Strategy includes education of students with high qualifications and high mobility. Adapting the study program to the National Qualifications Framework is in line with the University's Development Strategy regarding continuous improvement of the quality of education. The assumptions of this strategy are also implemented in a two-cycle model, in accordance with the Bologna Process, and the coordination of study plans and programs between the AGH UST faculties running the same field of study.

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

Today’s economy for the manufacture of fuels, chemicals and materials is crude oil-based. Many petrochemicals (olefins, aromatics, glycols, and polymers) are manufactured as side streams during crude oil refining, of which primary goal remains transportation fuel production. Oil companies like Saudi Aramco, ExxonMobil, UOP, Sinopec, China National Petroleum Corporation, Valero Energy, Marathon Oil are installing new equipment and even designing new processes to meet demand for oil products worldwide. Natural gas and crude oil exploitation and processing play a major role in shaping the modern society. The

graduates of the offered Petroleum Engineering course have a wide spectrum of competences and skills to work in this demanding area. Due to the complexity of the study program our graduates can find jobs in different fields including reservoir engineering, drilling engineering and production engineering. Reservoir engineers are responsible for predicting the recoverable oil and gas from the reservoir and developing the most appropriate technology to produce hydrocarbons. This stage is crucial for the Oil & Gas companies as it allows to predict the future profit while minimizing the risk of the investment. The subjects like economics and investment management in petroleum engineering will introduce our graduates into financial decision-making in the oil and gas industry. A proper development of the field is necessary to increase the efficiency of the production in a safe, environmentally responsible and sustainable manner. Our graduates will gain knowledge of petroleum production systems, improved oil recovery and reservoir simulation and optimization. Drilling engineering is an important part of our course as drilling is the most expensive part of reservoir development. Our graduates will have knowledge and competences required to drill a successful well with the minimum cost. Their education profile will also include advanced trenchless technologies and geothermal energy utilization which allow them to work in companies operating in the field of mining, geotechnics and civil engineering. The investment plans of the leading domestic energy companies operating in the field of exploration and production of hydrocarbons, transmission and distribution of gaseous fuels assume that significant funds (billions of PLN) will be allocated to the implementation of investments - gas transmission networks, including gas interconnections, as well as in the gas distribution segment. In 2020 an accelerated gasification program was announced, which will translate into an increase in the implementation of works by companies that design and build gas networks, and thus - as can be observed – employment for graduates of the Oil and Gas Engineering, specialization: Petroleum Engineering. For several years, as part of strengthening the cooperation between AGH-UST and the Gas Transmission System Operator Gaz-System, it has been organizing annual paid internships for best students, including primary students, who graduated in Oil and Gas Engineering. The Polish Gas Distribution System (PSG) also offers an internship program for second-cycle students of Oil and Gas Engineering. The main goal of Poland's energy policy is focused on increasing the domestic production of natural gas. To achieve this goal, the Polish Oil and Gas Company PGNiG SA has been earmarked significant funds for the exploration and production of natural gas reservoirs. In recent years, the consumption of resources by the energy sector has also been growing, which also translates into an increase in demand for graduates from the Drilling, Oil and Gas Faculty. It should also be emphasized that last academic year our students received a paid internship as a part of the third edition of the internship program "Energy for the Future". The organizer of the internship program are the Ministry of Energy, PGE SA, Polish Oil Company ORLEN SA and PGNiG Group.

Learning paths - scope in Polish and in English

- n.d. (PL)
- n.a. (EN)

Diploma paths - scope in Polish and in English

- n.d. (PL)
- n.a. (EN)

The names of the specialties in Polish and in English

Name [pl]	Name [en]
Petroleum Engineering	Petroleum Engineering

General information about the study programme

Major: Inżynieria Naftowa i Gazownicza
Specialty: Petroleum Engineering

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

The education at Petroleum Engineering specialization includes topics from oil and gas engineering as well as drilling engineering. Subjects in the area of crude oil production and refining include petroleum production systems, improved oil recovery, well stimulation methods, reservoir simulation and optimization, petroleum chemistry and refining, petroleum products analysis. Students will gain knowledge in the field of economics of energy production and social impact of the petroleum industry. Additionally, petroleum geology and geophysics and environmental protection will be discussed in detail. Specialization provides knowledge in the deep and shallow drilling. Classes includes also: designing the exploration and exploitation of gas and oil reservoirs, advanced drilling fluids, borehole hydraulics, geothermal energy utilization, geomechanics, well completion and workover, directional drilling, trenchless technology, designing of underground gas storage, facilities operating in various reservoir conditions with the use of computer simulators, estimating of hydrocarbon reserves using mass balance methods and computer simulation methods, designing the development of natural gas reservoirs, gas transmission and distribution networks, gas compressor stations and environmental protection in the gas industry, performing economical assessments for energy sector on local and global scale, developing methods of effective use of natural gas, physics of natural gas and crude oil reservoirs, hydrodynamics and gas dynamics in multiphase flow in reservoirs, the technology of liquefied gas LNG, analysis of flow phenomena (diffusion and dispersion) accompanying the flow in porous media, gas-dynamic methods of testing production wells and natural gas reservoirs, analyzes of issues related to carbon dioxide sequestration, e.g. alternative fuels, technologies, methods related to innovative technologies in the oil and gas industry. The Petroleum Engineering specialization, conducted in English, helps to acquire and develop language competences at the B2 + level (these competences are verified at the Drilling Engineering II course). Workplaces: Enterprises involved in the design, production and operation of oil and gas equipment and installations, national and international oil and gas companies, service companies, drilling contractors, gas system operators, crude oil and natural gas fields operators and UGS facilities, geothermal companies, enterprises working in the field of earthworks and construction services for the renovation and replacement of gas pipelines, companies dealing in trade, logistics and transport of fuels, including LNG, mining and geoengineering enterprises, design offices, research laboratories and scientific units, state and local administration bodies and oil refineries.

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

The percentage of employed graduates of the Drilling, Oil and Gas Faculty does not differ from other AGH Faculties. At the same time, a detailed analysis of the monitoring of professional careers of graduates of the second degree studies in Oil and Gas Engineering showed the advisability of modifying the study program in order to increase the employment rate of students and graduates of the faculty in the industry. In the current study program, it adapted the teaching to the labour market, the merit content provided to students within individual subject modules was adapted to the current level of knowledge in this field and the technologies currently used in the industry. The teaching of subjects related to IT systems have been introduced and changed in such a way that the graduates can gain advanced software application skills along with the basic skills of creating technical

documentation. Modern measuring equipment was acquired, used in the didactic process during laboratory exercises, and parts of the auditorium exercises were replaced with laboratory and project exercises in order to increase the participation of classes increasing the student's practical skills. Faculty developed for students and graduates a policy of professional training and internships in leading and small industry companies (additional, not covered by the obligation resulting from the study program), to increase the qualifications of future potential employees. This also gives to companies the opportunity to recognize potential future employees who are graduating the Drilling, Oil and Gas Faculty. More and more frequent meetings, workshops, and lectures with the active participation of industry representatives are organized as part of the scientific associations and SPE section activity.

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

In recent years, the Polish Accreditation Committee has not carried out any inspections at the Faculty.

Information on including examples of good practice in the study program

Due to the regular participation of the faculty's teaching staff in the annual international Drilling-Oil-Gas conference organized by the Faculty and other national and international conferences, the study program considers the state-of-the-art knowledge in techniques and technologies applied in oil and gas industry. Also, the participation of our lecturers in other events, such as the World Gas Congress or the World Geothermal Congress, allows the transfer of knowledge gained there to students of the Faculty. Faculty lecturers take a part in the Erasmus + program (the so-called staff mobility for teaching) which allow for implementing foreign experiences in the didactic process realized at the Faculty. In addition, it is worth emphasizing that one of the lecturers at these studies took part in the Ministry of Science and Education project "Masters of Didactics".

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

The long-term cooperation of the Faculty with various external stakeholders contributes to the adaptation of the study program to the labor market. The scientific content provided to students at Oil and Gas Engineering is updated to the current level of knowledge in this field and currently used technologies in this sector. Our students have access to the most modern world software in drilling, exploitation, and geophysical research (eg Schlumberger or Landmark), software for oil and gas exploitation simulations (eg. Eclipse). The use of these programs is included in the content of selected modules implemented as laboratory or project exercise classes. Lectures and presentations on state-of-the-art technological solutions with experts and specialists from leading oil and gas industry companies are organized in order to supplement the study program content provided during the classes.
Also, cooperation with selected professional organizations and associations translates into adapting the content of the study program to the technical and legal requirements in the field of drilling and oil and gas exploitation (i.e. State Mining Authority as well as the Scientific and Technical Association of Engineers and Technicians of the Oil and Gas Industry).

Duration, rules and form of the apprenticeship

Professional training is not included in the course plan of full-time second-cycle studies.
Drilling, Oil and Gas Faculty has developed a policy of professional training and internships

(additional, not covered by the obligation resulting from the study program) for students and graduates of the Faculty in leading and small companies, raising the qualifications of future potential employees.

Admission criteria, rules and policies

Major: Inżynieria Naftowa i Gazownicza
Specialty: Petroleum Engineering

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

Additional conditions for admission to Master’s studies. Graduates of first-cycle studies (with the title of engineer) or long-cycle studies (with the M.Sc. degree) who have completed at least 60% of the hours of basic and major subjects which corresponds to the first-cycle studies program at the Faculty of Drilling, Oil and Gas in the fields of Geoengineering and Borehole Mining or Oil and Gas Engineering, may apply for admission to the second-cycle studies. Candidates who do not meet the above requirements will be able to complete program differences (additional fee) in the manner and scope determined by the Dean. Studies in a specific specialization may only be started if at least 10 students are qualified.

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 terms and conditions of recruitment are set in AGH UST Senate Resolution No. 179/2020 from June 26, 2020 on the terms, procedure and date of start and completion of recruitment for the first year of the first and second cycle studies in the 2021/2022 academic year. Fee - 1 950 Euro/semester (accommodation is not included).

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

The minimum number of students at the specialization: 10
The maximum number of students at the specialization: 30

Learning outcomes

Major: Oil and Gas Engineering
Specialty: Petroleum Engineering

Knowledge

KEU symbol	Directional learning outcomes	CEU symbol
ING2A_W01	(knows and understands) in depth selected facts, objects and phenomena as well as methods and theories regarding the explanation of complex relationships between them, which are an advanced general knowledge in the field of scientific disciplines: mathematics, physics, chemistry, mechanics, material engineering and computer science, and create a theoretical background	P7S_WG_A
ING2A_W02	(knows and understands) in depth selected facts, objects and phenomena as well as methods and theories explaining the complex relationships between them, which are an advanced general knowledge in Earth sciences, including geology, geophysics, hydrogeology and environmental protection, and create a theoretical background	P7S_WG_A
ING2A_W03	(knows and understands) in depth selected facts, objects and phenomena as well as methods and theories explaining the complex relationships between them, which are an ordered and theoretically founded knowledge covering key issues and selected issues in the field of advanced detailed knowledge of drilling and oil and gas engineering	P7S_WG_A, P7S_WG_A_Inz
ING2A_W04	(knows and understands) the fundamental dilemmas of modern civilization; economic, legal, ethical and other conditions of various types of professional activity related to drilling and oil and gas engineering, including the principles of protection of industrial property and copyright; basic rules for creating and developing various forms of entrepreneurship	P7S_WK_A, P7S_WK_A_Inz
ING2A_W05	(knows and understands) the basic processes occurring in the life cycle of equipment, facilities and technical systems in relation to oil drilling and oil and gas engineering	P7S_WG_A, P7S_WG_A_Inz
ING2A_W06	(knows and understands) the basic principles of management, including quality management and business environment in drilling and oil and gas industry; the basic principles of the creation and development of various forms of individual entrepreneurship	P7S_WK_A, P7S_WK_A_Inz

Skills

KEU symbol	Directional learning outcomes	CEU symbol
ING2A_U01	(can) use his knowledge, formulate and solve complex and unusual problems, and innovatively perform tasks in unpredictable conditions in the field of drilling and oil and gas engineering by proper selection of sources and information, its assessment, critical analysis, synthesis, creative interpretation and presentation of this information, selection and use of appropriate methods and tools, including advanced information and communication techniques, adaptation of existing or development of new methods and tools, formulation and testing of hypotheses related to simple research problems	P7S_UW_A_Inz_01, P7S_UW_A, P7S_UW_A_Inz_02
ING2A_U02	(can) communicate on specialized topics in the field of drilling as well as oil and gas engineering with diverse audiences; lead a debate; use a foreign language at B2 + level of the European Language Training Description System with specialized terminology	P7S_UK_A
ING2A_U03	(can) manage team work, interact with other people as part of team work, and undertake a leading role	P7S_UO_A

KEU symbol	Directional learning outcomes	CEU symbol
ING2A_U04	(can) independently plan and implement own lifelong learning in order to raise the level of knowledge, own qualifications and professional competences in the field of drilling and oil and gas engineering; guide others in this field	P7S_UU_A
ING2A_U05	(can) plan and carry out experiments, including computer calcualtions and simulations of issues in the field of drilling and oil and gas engineering, interpret the results obtained and present conclusions; identify and formulate specification for engineering tasks and solve them, with use of analytical, simulation and experimental methods, recognize their core and non-technical aspects, including ethical aspects, make a preliminary economic assessment of the proposed solutions and undertaken engineering activities; make a critical analysis on existing technical solutions and evaluate it	P7S_UW_A_Inz_01, P7S_UW_A
ING2A_U06	(can) according to given specification (typical for drilling, oil and gas engineering) design and create simple equipment, objects, systems or carry out processes using appropriately selected methods, techniques, technologies, tools and materials	P7S_UW_A, P7S_UW_A_Inz_02

Social competence

KEU symbol	Directional learning outcomes	CEU symbol
ING2A_K01	(is ready to) critically assess received knowledge and information, and constantly improve professional, personal and social competences; recognize the importance of knowledge to solve cognitive and practical problems in the field of drilling and as oil and gas engineering; consult experts in case of difficulties with self-contained solution to the problem	P7S_KK_A
ING2A_K02	(is ready to) responsibly perform professional roles, taking into account changing social needs, including developing the achievements in the profession of a mining engineer, maintaining the ethos of this profession, keeping and developing the principles of professional ethics and acting to comply with these principles	P7S_KR_A
ING2A_K03	(is ready to) take responsibility for his own work, (is ready to) behavior professionally in compliance with the principles of team work and responsibility for jointly performed tasks	P7S_KR_A
ING2A_K04	(is ready to) fulfill social obligations as a graduate of a technical university, inspire and organize activities for the social environment, initiating activities for the public interest; thinking and acting in an entrepreneurial manner; providing the public in a comprehensible way with information and opinions on achievements in the field of drilling and as oil and gas engineering	P7S_KO_A

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

Major: Oil and Gas Engineering
Speciality: Petroleum Engineering

Knowledge

CEU symbol	Learning outcomes for qualifications including engineering competence	KEU references
P7S_WG_A_Inz	knowledge of basic processes taking place in the life cycle of technical devices, facilities and systems	ING2A_W03, ING2A_W05
P7S_WK_A_Inz	knowledge of basic principles of creating and developing various forms of individual entrepreneurship	ING2A_W04, ING2A_W06

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;	ING2A_U01, ING2A_U05
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	ING2A_U01, ING2A_U06

Directional outcomes coverage matrix

Major: Oil and Gas Engineering
Specialty: Petroleum Engineering

2021/2022/S/IIi/WNiG/ING/PE

Subject	Code	ING2A_W01	ING2A_W02	ING2A_W03	ING2A_W04	ING2A_W05	ING2A_W06	ING2A_U01	ING2A_U02	ING2A_U03	ING2A_U04	ING2A_U05	ING2A_U06	ING2A_K01	ING2A_K02	ING2A_K03	ING2A_K04
Advances in Fluid Mechanics	WINGPES.IIi1K.e86e5d33aca6265aa1409713f6881db8.21	x		x				x		x							
Natural Gas Transport and Distribution	WINGPES.IIi1PJO.5fb24bc9d0102.21	x	x	x		x		x	x	x	x	x	x	x		x	x
Inteligent Multigas Pipeline Systems Design	WINGPES.IIi1PJO.5fb24bcc6cb23.21	x	x	x		x		x	x		x	x		x	x		
Petroleum Chemistry and Refining	WINGPES.IIi1PJO.5fb24bcdea77e.21	x		x		x	x	x				x		x		x	
Geothermal Utilisation	WINGPES.IIi1PJO.5fb24bcf7371a.21	x	x	x				x	x	x				x	x		
Petroleum Geology and Geophysics	WINGPES.IIi1P.5fb24bc75a581.21	x	x					x	x					x	x		x
Modeling Economic and Social Impact in the Petroleum Industry	WINGPES.IIi1HS.5fdc833c027cd.21	x	x	x				x				x		x			
Drilling Geomechanics	WINGPES.IIi1K.5fb25e05527ac.21	x	x	x	x					x	x		x	x		x	x
Energy of Geothermal Sources	WINGPES.IIi1PJO.5fb25d89bb571.21	x	x	x				x	x	x				x	x		
Uncoventional Natural Gas	WINGPES.IIi1PJO.268fd0c1cd995413ff568cae2fc16ea7.21	x	x	x		x		x	x	x	x	x	x	x		x	x
Management of Risk in the Petroleum Industry	WINGPES.IIi1HS.5fdc82ff7316f.21	x	x	x				x				x		x			
Petroleum Products Analysis	WINGPES.IIi1PJO.5fb24bce6c29e.21	x		x		x	x	x				x		x		x	
Fluid Flow in Gas Reservoirs	WINGPES.IIi1PJO.5fb24bcce2437.21	x	x	x		x		x	x		x	x		x	x		
Liquefied Natural Gas Technologies	WINGPES.IIi1PJO.5fb25c1e42ec7.21	x	x	x		x		x	x		x	x		x	x		

Subject	Code	ING2A_W01	ING2A_W02	ING2A_W03	ING2A_W04	ING2A_W05	ING2A_W06	ING2A_U01	ING2A_U02	ING2A_U03	ING2A_U04	ING2A_U05	ING2A_U06	ING2A_K01	ING2A_K02	ING2A_K03	ING2A_K04
Applied Hydrocarbon Thermodynamics	WINGPES.IIi1P.5fb24bc7e2112.21	x	x	x				x	x	x	x	x	x				
Analytical Methods in Petroleum Industry	WINGPES.IIi1PJO.5fb24bcee1667.21	x		x		x	x	x				x		x		x	
Applied Reservoir Engineering and Gas Reservoir Simulation	WINGPES.IIi1PJO.5fb24bca5f872.21	x	x	x		x		x	x	x	x	x	x	x		x	x
Capital Budgeting in the Petroleum Industry	WINGPES.IIi1HS.5fdc82ce33eab.21	x	x	x				x				x		x			
Environmental Protection and Water Management	WINGPES.IIi1P.5fb24bc863110.21	x	x					x	x						x		x
Drilling Engineering I	WINGPES.IIi1S.5fb24bc8d9a2d.21	x	x	x		x			x		x		x		x	x	x
Student Scientific Association	WINGPES.IIi2PJO.5fb24bd7c68d9.21	x	x	x				x			x			x		x	
Drilling Mud Additives	WINGPES.IIi2PJO.5fb24bd6bb658.21	x	x	x								x		x		x	
Gas Conditioning	WINGPES.IIi2PJO.5fb24bd4ca04f.21	x	x	x				x		x	x	x					
Advanced Trenchless Technology	WINGPES.IIi2PJO.5fb2593873268.21	x	x	x				x			x			x		x	
Advanced Drilling Fluids	WINGPES.IIi2PJO.5fb24bd73f09f.21	x	x	x								x		x		x	
Gas Separation and Purification	WINGPES.IIi2PJO.5fb24bd54c566.21	x	x	x				x		x	x	x					
Heat Engines and Compressor Machines	WINGPES.IIi2PJO.5fb24bd85ae18.21	x	x	x				x			x			x		x	
Materials and Corrosion	WINGPES.IIi2PJO.5fb24bd8d2ea0.21	x	x	x				x			x			x		x	
Natural Gas Engineering	WINGPES.IIi2K.5fb257b92dce7.21	x	x			x		x	x			x					
Economics of Energy Production	WINGPES.IIi2P.5fb24bd0e5a4e.21	x		x	x			x	x			x		x		x	x
Well Completion and Workover	WINGPES.IIi2S.5fb24bd168b1b.21	x	x	x		x		x		x	x			x			x
Petroleum Production Systems	WINGPES.IIi2K.5fb24bd1de422.21	x	x					x	x					x			

Subject	Code	ING2A_W01	ING2A_W02	ING2A_W03	ING2A_W04	ING2A_W05	ING2A_W06	ING2A_U01	ING2A_U02	ING2A_U03	ING2A_U04	ING2A_U05	ING2A_U06	ING2A_K01	ING2A_K02	ING2A_K03	ING2A_K04
Economics and Investment Management in Petroleum Engineering	WINGPES.IIi2HS.5fb24bd260928.21	x	x	x	x	x	x	x	x	x	x	x	x				
Natural Gas and Energy Storage	WINGPES.IIi2S.5fb24bd2d66d8.21		x	x	x			x				x		x			
Reservoir Simulation and Optimization	WINGPES.IIi2S.5fb24bd357ef9.21	x	x	x		x	x	x	x			x	x	x	x	x	x
Drilling Engineering II	WINGPES.IIi2S.5fb24bd3cf22b.21	x	x	x					x		x	x	x		x	x	x
Advanced Natural Gas Production Engineering	WINGPES.IIi4S.5fb24bda37a63.21	x	x	x		x		x				x		x	x		
Graduation Seminar	WINGPES.IIi4S.5fb25d0ce063d.21	x			x		x				x	x		x		x	
Drilling Bits and Downholes Tools	WINGPES.IIi4PJO.5fb24bddc30c3.21		x	x	x	x		x	x		x	x	x	x	x	x	x
Improved Oil Recovery	WINGPES.IIi4PJO.5fb24bdb668c9.21	x	x	x				x	x			x	x	x	x		
Offshore Drilling Platforms and Equipment	WINGPES.IIi4PJO.5fb24bde6714e.21		x	x	x	x		x	x		x	x	x	x	x	x	x
Well Stimulation Methods	WINGPES.IIi4PJO.5fb24bdc1edb1.21	x	x	x				x	x			x	x	x	x		
Master's Thesis	WINGPES.IIi4S.5fb25c85651e6.21	x	x	x	x	x	x	x	x		x	x	x	x	x	x	
Numerical Methods in Petroleum Engineering	WINGPES.IIi4PJO.5fb24bdcc62a1.21	x	x	x				x	x			x	x	x	x		
Sum:		41	38	39	8	18	7	38	24	12	22	31	15	35	17	21	13

Characteristics matrix of learning outcomes in relation to modules

Major: Inżynieria Naftowa i Gazownicza
Speciality: Petroleum Engineering

2021/2022/S/IIi/WNiG/ING/PE

Subject	Code	P7S_WG_A	P7S_WG_A_Inz	P7S_WK_A	P7S_WK_A_Inz	P7S_UW_A_Inz_01	P7S_UW_A	P7S_UW_A_Inz_02	P7S_UK_A	P7S_UO_A	P7S_UU_A	P7S_KK_A	P7S_KR_A	P7S_KO_A
Advances in Fluid Mechanics	WINGPES.IIi1K.e86e5d33aca6265aa1409713f6881db8.21	x	x			x	x	x		x				
Natural Gas Transport and Distribution	WINGPES.IIi1PJO.5fb24bc9d0102.21	x	x			x	x	x	x	x	x	x	x	x
Inteligent Multigas Pipeline Systems Design	WINGPES.IIi1PJO.5fb24bcc6cb23.21	x	x			x	x	x	x		x	x	x	
Petroleum Chemistry and Refining	WINGPES.IIi1PJO.5fb24bcdea77e.21	x	x	x	x	x	x	x				x	x	
Geothermal Utilisation	WINGPES.IIi1PJO.5fb24bcf7371a.21	x	x			x	x	x	x	x		x	x	
Petroleum Geology and Geophysics	WINGPES.IIi1P.5fb24bc75a581.21	x				x	x	x	x			x	x	x
Modeling Economic and Social Impact in the Petroleum Industry	WINGPES.IIi1HS.5fdc833c027cd.21	x	x			x	x	x				x		
Drilling Geomechanics	WINGPES.IIi1K.5fb25e05527ac.21	x	x	x	x		x	x		x	x	x	x	x
Energy of Geothermal Sources	WINGPES.IIi1PJO.5fb25d89bb571.21	x	x			x	x	x	x	x		x	x	
Uncoventional Natural Gas	WINGPES.IIi1PJO.268fd0c1cd995413ff568cae2fc16ea7.21	x	x			x	x	x	x	x	x	x	x	x
Management of Risk in the Petroleum Industry	WINGPES.IIi1HS.5fdc82ff7316f.21	x	x			x	x	x				x		
Petroleum Products Analysis	WINGPES.IIi1PJO.5fb24bce6c29e.21	x	x	x	x	x	x	x				x	x	
Fluid Flow in Gas Reservoirs	WINGPES.IIi1PJO.5fb24bcce2437.21	x	x			x	x	x	x		x	x	x	

Subject	Code	P7S_WG_A	P7S_WG_A_Inz	P7S_WK_A	P7S_WK_A_Inz	P7S_UW_A_Inz_01	P7S_UW_A	P7S_UW_A_Inz_02	P7S_UK_A	P7S_UO_A	P7S_UU_A	P7S_KK_A	P7S_KR_A	P7S_KO_A
Liquefied Natural Gas Technologies	WINGPES.IIi1PJO.5fb25c1e42ec7.21	x	x			x	x	x	x		x	x	x	
Applied Hydrocarbon Thermodynamics	WINGPES.IIi1P.5fb24bc7e2112.21	x	x			x	x	x	x	x	x			
Analytical Methods in Petroleum Industry	WINGPES.IIi1PJO.5fb24bcee1667.21	x	x	x	x	x	x	x				x	x	
Applied Reservoir Engineering and Gas Reservoir Simulation	WINGPES.IIi1PJO.5fb24bca5f872.21	x	x			x	x	x	x	x	x	x	x	x
Capital Budgeting in the Petroleum Industry	WINGPES.IIi1HS.5fdc82ce33eab.21	x	x			x	x	x				x		
Environmental Protection and Water Management	WINGPES.IIi1P.5fb24bc863110.21	x				x	x	x	x				x	x
Drilling Engineering I	WINGPES.IIi1S.5fb24bc8d9a2d.21	x	x				x	x	x		x		x	x
Student Scientific Association	WINGPES.IIi2PJO.5fb24bd7c68d9.21	x	x			x	x	x			x	x	x	
Drilling Mud Additives	WINGPES.IIi2PJO.5fb24bd6bb658.21	x	x			x	x					x	x	
Gas Conditioning	WINGPES.IIi2PJO.5fb24bd4ca04f.21	x	x			x	x	x		x	x			
Advanced Trenchless Technology	WINGPES.IIi2PJO.5fb2593873268.21	x	x			x	x	x			x	x	x	
Advanced Drilling Fluids	WINGPES.IIi2PJO.5fb24bd73f09f.21	x	x			x	x					x	x	
Gas Separation and Purification	WINGPES.IIi2PJO.5fb24bd54c566.21	x	x			x	x	x		x	x			
Heat Engines and Compressor Machines	WINGPES.IIi2PJO.5fb24bd85ae18.21	x	x			x	x	x			x	x	x	
Materials and Corrosion	WINGPES.IIi2PJO.5fb24bd8d2ea0.21	x	x			x	x	x			x	x	x	
Natural Gas Engineering	WINGPES.IIi2K.5fb257b92dce7.21	x	x			x	x	x	x					
Economics of Energy Production	WINGPES.IIi2P.5fb24bd0e5a4e.21	x	x	x	x	x	x	x	x			x	x	x
Well Completion and Workover	WINGPES.IIi2S.5fb24bd168b1b.21	x	x			x	x	x		x	x	x		x

Subject	Code	P7S_WG_A	P7S_WG_A_Inz	P7S_WK_A	P7S_WK_A_Inz	P7S_UW_A_Inz_01	P7S_UW_A	P7S_UW_A_Inz_02	P7S_UK_A	P7S_UO_A	P7S_UU_A	P7S_KK_A	P7S_KR_A	P7S_KO_A
Petroleum Production Systems	WINGPES.IIi2K.5fb24bd1de422.21	x				x	x	x	x			x		
Economics and Investment Management in Petroleum Engineering	WINGPES.IIi2HS.5fb24bd260928.21	x	x	x	x	x	x	x	x	x	x			
Natural Gas and Energy Storage	WINGPES.IIi2S.5fb24bd2d66d8.21	x	x	x	x	x	x	x				x		
Reservoir Simulation and Optimization	WINGPES.IIi2S.5fb24bd357ef9.21	x	x	x	x	x	x	x	x			x	x	x
Drilling Engineering II	WINGPES.IIi2S.5fb24bd3cf22b.21	x	x			x	x	x	x		x		x	x
Advanced Natural Gas Production Engineering	WINGPES.IIi4S.5fb24bda37a63.21	x	x			x	x	x				x	x	
Graduation Seminar	WINGPES.IIi4S.5fb25d0ce063d.21	x		x	x	x	x				x	x	x	
Drilling Bits and Downholes Tools	WINGPES.IIi4PJO.5fb24bddc30c3.21	x	x	x	x	x	x	x	x		x	x	x	x
Improved Oil Recovery	WINGPES.IIi4PJO.5fb24bdb668c9.21	x	x			x	x	x	x			x	x	
Offshore Drilling Platforms and Equipment	WINGPES.IIi4PJO.5fb24bde6714e.21	x	x	x	x	x	x	x	x		x	x	x	x
Well Stimulation Methods	WINGPES.IIi4PJO.5fb24bdc1edb1.21	x	x			x	x	x	x			x	x	
Master's Thesis	WINGPES.IIi4S.5fb25c85651e6.21	x	x	x	x	x	x	x	x		x	x	x	
Numerical Methods in Petroleum Engineering	WINGPES.IIi4PJO.5fb24bdcc62a1.21	x	x			x	x	x	x			x	x	
Suma:		44	40	12	12	42	44	41	24	12	22	35	32	13

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

Major: Oil and Gas Engineering
Speciality: Petroleum Engineering

2021/2022/S/IIi/WNiG/ING/PE

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
Advances in Fluid Mechanics	Lecture, Project classes	Test, Execution of a project, Report	ING2A_W01, ING2A_W03, ING2A_U01, ING2A_U03
Natural Gas Transport and Distribution	Lecture, Project classes, Laboratory classes	Test, Project, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W05, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U03, ING2A_U05, ING2A_U04, ING2A_U06, ING2A_K01, ING2A_K03, ING2A_K04
Inteligent Multigas Pipeline Systems Design	Lecture, Project classes	Test, Project	ING2A_W01, ING2A_W02, ING2A_W05, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U05, ING2A_U04, ING2A_K01, ING2A_K02
Petroleum Chemistry and Refining	Lecture, Laboratory classes	Test, Execution of laboratory classes, Report	ING2A_W01, ING2A_W03, ING2A_W05, ING2A_W06, ING2A_U01, ING2A_U05, ING2A_K01, ING2A_K03
Geothermal Utilisation	Lecture, Project classes	Test, Activity during classes, Project, Case study	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U03, ING2A_K01, ING2A_K02
Petroleum Geology and Geophysics	Lecture, Project classes	Activity during classes, Participation in a discussion, Examination, Participation in a discussion, Execution of a project, Test, Report, Involvement in teamwork	ING2A_W02, ING2A_W01, ING2A_U01, ING2A_U02, ING2A_K01, ING2A_K02, ING2A_K04
Modeling Economic and Social Impact in the Petroleum Industry	Lecture, Laboratory classes	Activity during classes, Execution of laboratory classes, Report	ING2A_W01, ING2A_W03, ING2A_W02, ING2A_U01, ING2A_U05, ING2A_K01
Drilling Geomechanics	Lecture, Project classes	Activity during classes, Activity during classes, Project, Case study, Presentation, Oral answer	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W04, ING2A_U03, ING2A_U04, ING2A_U06, ING2A_K01, ING2A_K03, ING2A_K04
Energy of Geothermal Sources	Lecture, Project classes	Test, Project	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U03, ING2A_K01, ING2A_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
Uncoventional Natural Gas	Lecture, Project classes, Laboratory classes	Test, Project, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W05, ING2A_U01, ING2A_U02, ING2A_U03, ING2A_U04, ING2A_U05, ING2A_U06, ING2A_K01, ING2A_K03, ING2A_K04
Management of Risk in the Petroleum Industry	Lecture, Project classes	Activity during classes, Participation in a discussion, Project	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U05, ING2A_K01
Petroleum Products Analysis	Lecture, Laboratory classes	Test, Execution of laboratory classes, Report	ING2A_W01, ING2A_W06, ING2A_W03, ING2A_W05, ING2A_U01, ING2A_U05, ING2A_K01, ING2A_K03
Fluid Flow in Gas Reservoirs	Lecture, Project classes	Test, Execution of a project	ING2A_W02, ING2A_W03, ING2A_W05, ING2A_W01, ING2A_U01, ING2A_U02, ING2A_U04, ING2A_U05, ING2A_K01, ING2A_K02
Liquefied Natural Gas Technologies	Lecture, Project classes	Test, Execution of a project	ING2A_W01, ING2A_W03, ING2A_W05, ING2A_W02, ING2A_U01, ING2A_U02, ING2A_U04, ING2A_U05, ING2A_K01, ING2A_K02
Applied Hydrocarbon Thermodynamics	Lecture, Project classes	Test, Project	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U05, ING2A_U06, ING2A_U03, ING2A_U04
Analytical Methods in Petroleum Industry	Lecture, Laboratory classes	Test, Execution of laboratory classes, Report	ING2A_W03, ING2A_W05, ING2A_W06, ING2A_W01, ING2A_U01, ING2A_U05, ING2A_K01, ING2A_K03
Applied Reservoir Engineering and Gas Reservoir Simulation	Lecture, Project classes, Laboratory classes	Test, Execution of a project, Presentation, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W05, ING2A_U01, ING2A_U03, ING2A_U04, ING2A_U05, ING2A_U06, ING2A_U02, ING2A_K01, ING2A_K03, ING2A_K04
Capital Budgeting in the Petroleum Industry	Lecture, Project classes	Activity during classes, Participation in a discussion, Execution of a project	ING2A_W01, ING2A_W03, ING2A_W02, ING2A_U01, ING2A_U05, ING2A_K01
Environmental Protection and Water Management	Lecture, Project classes, Laboratory classes	Examination, Execution of a project, Oral answer, Execution of laboratory classes, Report, Oral answer	ING2A_W01, ING2A_W02, ING2A_U01, ING2A_U02, ING2A_K02, ING2A_K04
Drilling Engineering I	Lecture, Project classes, Laboratory classes	Activity during classes, Presentation, Activity during classes, Project, Case study, Presentation, Activity during classes, Test, Report, Completion of laboratory classes	ING2A_W02, ING2A_W03, ING2A_W05, ING2A_W01, ING2A_U02, ING2A_U04, ING2A_U06, ING2A_K02, ING2A_K03, ING2A_K04

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
Student Scientific Association	Participation in a student research club	Involvement in teamwork, Coordination, conduct of a research project, preparation of a scientific paper, organization, organization of conferences, camps and scientific trips.	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U04, ING2A_K01, ING2A_K03
Drilling Mud Additives	Lecture, Project classes, Laboratory classes	Activity during classes, Execution of a project, Execution of laboratory classes, Report	ING2A_W03, ING2A_W01, ING2A_W02, ING2A_U05, ING2A_K01, ING2A_K03
Gas Conditioning	Lecture, Laboratory classes	Test, Execution of laboratory classes, Report	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U03, ING2A_U04, ING2A_U05
Advanced Trenchless Technology	Lecture, Project classes	Test, Activity during classes, Test, Project, Oral answer	ING2A_W02, ING2A_W03, ING2A_W01, ING2A_U01, ING2A_U04, ING2A_K01, ING2A_K03
Advanced Drilling Fluids	Lecture, Project classes, Laboratory classes	Activity during classes, Execution of a project, Execution of laboratory classes, Report	ING2A_W03, ING2A_W01, ING2A_W02, ING2A_U05, ING2A_K01, ING2A_K03
Gas Separation and Purification	Lecture, Laboratory classes	Test results, Execution of laboratory classes, Report	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U03, ING2A_U04, ING2A_U05
Heat Engines and Compressor Machines	Lecture, Project classes	Test, Project	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U04, ING2A_K01, ING2A_K03
Materials and Corrosion	Lecture, Project classes	Test, Oral answer, Project, Oral answer	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U04, ING2A_K01, ING2A_K03
Natural Gas Engineering	Lecture, Project classes	Test, Project	ING2A_W01, ING2A_W02, ING2A_W05, ING2A_U01, ING2A_U02, ING2A_U05
Economics of Energy Production	Lecture, Project classes	Activity during classes, Participation in a discussion, Activity during classes, Execution of a project	ING2A_W01, ING2A_W03, ING2A_W04, ING2A_U01, ING2A_U02, ING2A_U05, ING2A_K01, ING2A_K03, ING2A_K04
Well Completion and Workover	Lecture, Project classes	Activity during classes, Test, Execution of a project	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W05, ING2A_U01, ING2A_U03, ING2A_U04, ING2A_K01, ING2A_K04

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
Petroleum Production Systems	Lecture, Project classes, Laboratory classes	Activity during classes, Examination, Activity during classes, Project, Oral answer, Activity during classes, Execution of laboratory classes, Report	ING2A_W01, ING2A_W02, ING2A_U01, ING2A_U02, ING2A_K01
Economics and Investment Management in Petroleum Engineering	Lecture, Project classes, Laboratory classes	Test, Execution of a project, Oral answer, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W04, ING2A_W05, ING2A_W06, ING2A_U01, ING2A_U02, ING2A_U03, ING2A_U04, ING2A_U05, ING2A_U06
Natural Gas and Energy Storage	Lecture, Project classes, Laboratory classes	Test, Project, Execution of laboratory classes, Report	ING2A_W04, ING2A_W03, ING2A_W02, ING2A_U05, ING2A_U01, ING2A_K01
Reservoir Simulation and Optimization	Lecture, Project classes, Laboratory classes	Test, Project, Test results, Execution of laboratory classes, Test results, Completion of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W05, ING2A_W06, ING2A_U01, ING2A_U06, ING2A_U02, ING2A_U05, ING2A_K01, ING2A_K02, ING2A_K03, ING2A_K04
Drilling Engineering II	Lecture, Project classes, Laboratory classes	Activity during classes, Examination, Activity during classes, Project, Case study, Presentation, Oral answer, Activity during classes, Test, Report, Completion of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U02, ING2A_U04, ING2A_U05, ING2A_U06, ING2A_K02, ING2A_K03, ING2A_K04
Advanced Natural Gas Production Engineering	Lecture, Project classes	Examination, Project, Oral answer	ING2A_W01, ING2A_W02, ING2A_W05, ING2A_W03, ING2A_U01, ING2A_U05, ING2A_K01, ING2A_K02
Graduation Seminar	Seminars	Activity during classes, Diploma thesis preparation, Presentation	ING2A_W04, ING2A_W06, ING2A_W01, ING2A_U04, ING2A_U05, ING2A_K01, ING2A_K03
Drilling Bits and Downholes Tools	Lecture, Project classes	Test, Execution of a project, Test	ING2A_W02, ING2A_W03, ING2A_W04, ING2A_W05, ING2A_U02, ING2A_U04, ING2A_U05, ING2A_U01, ING2A_U06, ING2A_K01, ING2A_K02, ING2A_K03, ING2A_K04
Improved Oil Recovery	Lecture, Project classes, Laboratory classes	Activity during classes, Execution of a project, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U05, ING2A_U06, ING2A_K01, ING2A_K02
Offshore Drilling Platforms and Equipment	Lecture, Project classes	Test, Activity during classes, Execution of a project	ING2A_W02, ING2A_W03, ING2A_W04, ING2A_W05, ING2A_U01, ING2A_U05, ING2A_U06, ING2A_U02, ING2A_U04, ING2A_K01, ING2A_K02, ING2A_K03, ING2A_K04

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
Well Stimulation Methods	Lecture, Project classes, Laboratory classes	Activity during classes, Execution of a project, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U05, ING2A_U06, ING2A_K01, ING2A_K02
Master's Thesis	Thesis	Review of a thesis	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_W04, ING2A_W05, ING2A_W06, ING2A_U01, ING2A_U02, ING2A_U04, ING2A_U05, ING2A_U06, ING2A_K01, ING2A_K02, ING2A_K03
Numerical Methods in Petroleum Engineering	Lecture, Project classes, Laboratory classes	Activity during classes, Execution of a project, Execution of laboratory classes	ING2A_W01, ING2A_W02, ING2A_W03, ING2A_U01, ING2A_U02, ING2A_U05, ING2A_U06, ING2A_K01, ING2A_K02

ECTS credits calculations

Major: Inżynieria Naftowa i Gazownicza
Specialty: Petroleum Engineering

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	48
core science classes relevant to a given major	13
practical classes, developing practical skills, including laboratory, design, practical and workshop classes	46
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)	27
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	3
apprenticeships	N/A
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)	59
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)	N/A

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

Major: Inżynieria Naftowa i Gazownicza
Specialty: Petroleum Engineering

Enrollment rules for the next semester

Detailed conditions for a semester entry are given in §17 of the AGH-UST Study Regulations The conditions for completing a semester of studies are:

1. obtaining by the student credits for all modules of classes that are compulsory for a given field of study, level and profile of education and specialization included in the plan for particular semester of studies,
2. obtaining by the student at least 27-33 ECTS points, depending on the number of ECTS points provided in the study plan for a given semester of study.

Successful completion of a semester of study and confirmation of registration for the next semester of studies is made in the University's system no later than within a week of the beginning of the next semester of study. Confirmation of the registration is also made in the student's periodic achievement card.

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

The condition for completing a semester of studies is:

1. obtaining by the student a credit for all modules of classes that are compulsory for a given field of study, level and profile of education and specialization given in the plan for this semester of studies;
2. obtaining by the student at least 27-33 ECTS points, depending on the number of ECTS points provided in the study plan for a given semester of study.

Completion of a semester of study and confirmation of registration for the next semester of studies is made in the University's system no later than within a week of the beginning of the next semester of study. Confirmation of the registration is also made in the student's periodic achievement card. In case of failure to meet the conditions referred in point 1 or 2, the student may apply for registration for the next semester of studies from the so-called allowable total deficit of points. In such case, an application should be submitted to the Dean of the Faculty. The admissible total deficit of points is 12 ECTS points for second-cycle studies, is determined by the competent committee of the Faculty.

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)

At the Drilling, Oil and Gas Faculty, organization of classes within the so-called blocks is allowed with the permission of the Dean of the Faculty. In situations where there are indications for such an arrangement of classes, they are synchronized with other forms of

classes so that they achieve all learning outcomes.

Monitoring semesters

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

An application for granting an individual study program should be submitted to the Dean of the Faculty along with a justification, immediately after the occurrence of the reason constituting the basis for it granting. Detailed qualification conditions are regulated in §9 of the AGH-UST Study Regulations and the Rules for the implementation of an individual study program for 1st and 2nd cycle students at the Drilling, Oil and Gas Faculty, adopted by the Faculty Council.

Implementation of apprenticeships including monitoring system and completion rules

Professional training are not included in the plan of full-time second-cycle studies. The Drilling, Oil and Gas Faculty has developed a policy of industrial internships and professional trainings (additional, not covered by the obligation resulting from the study program) for students and graduates of the Faculty in leading and small industry companies, raising the qualifications of future potential employees.

Rules of elective modules taking

During the studies, the student is expected to select optional modules of classes within the so-called blocks of optional subjects in the specified semesters of study. The student enrolls to voluntarily selected optional module (subject) by registering in the Dean's office or electronically (if possible). From each block of subjects, the student chooses one selected module of classes with a specified number of ECTS points. Enrollment for selected modules should be made 2 weeks before the end of classes in the semester preceding the academic year in which the modules will be valid. The student is assigned to the appropriate module after the registration is completed, in the week before the start of the semester in which the given module is valid. Only selected courses for which not less than 5 students are enrolled will be implemented. The percentage of employed graduates of the Drilling, Oil and Gas Faculty does not differ from other units at AGH. At the same time, a detailed analysis of the monitoring of professional careers of graduates of the second cycle studies at Oil and Gas Engineering indicated the advisability to modify the study program in order to increase the employment rate of students and graduates of the faculty in industry companies. In the current study program, the program was adapted to the requirements of the labor market, the content provided to students within individual subject modules was adapted to the current level of knowledge in this field and to the technologies currently used in the industrial sector. The curricula of subjects related to IT systems were introduced and modified in such a way that the graduate had skills in the use of advanced software along with the basic skills of creating technical documentation. Modern measuring equipment was acquired, which will be used in the didactic process during laboratory exercises, and parts of the auditorium exercises were replaced with laboratory and project exercises in order to increase the share of classes which increase the student's practical skills. A policy of professional training and internships (additional, not covered by the obligation resulting from the study program) of students and graduates of the Faculty in leading and small industry companies was developed, increasing the qualifications of future potential

employees. This form also allows industry companies to learn about the potential of future employees who are graduates of the Drilling, Oil and Gas Faculty. The Faculty deliver more and more frequent meetings, workshops and lectures given by industry representatives as part of the work within Student Scientific Association, lectures of the SPE Poland section and Faculty conferences. In the case of a smaller number of students (e.g. specializations), it is possible to implement only one module from the block. After selected course module completion, the student receives the required number of ECTS.

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

Students select specializations at the stage of recruitment for second-cycle studies by indicating them in the enrollment system.

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

1. The general master's degree examination is conducted after the end of the course in diploma semester.
2. A student who has completed all subjects and internships provided in the program of study for a given field of study may take the general master's degree examination.
3. The general master's degree examination is to provide comprehensive answers to five questions in the thematic scope established for a given field of study and specialization.
4. A positive grade from the general master's degree examination determines the admission to further diploma proceedings in a given year.
5. In case of a negative grade in the general master's degree examination, the graduate student shall not be admitted to further diploma proceedings. Graduate student may retake the exam not earlier than two weeks and not later than three months from the date of the first exam (in one of the dates set by the Dean of the Faculty).
6. After submission of the diploma thesis and obtaining a positive grade for the General Master's Degree Exam, the student may proceed to defend the diploma thesis.
7. The diploma thesis defense is as follows:

   a) the graduate presents the main theses of his thesis,
   b) members of the Committee ask questions about the issues contained in thesis,
   c) the graduate leaves the examination room,
   d) the commission assesses the presentation of the thesis and the answers to the asked questions,
   e) The Chairman of the Diploma Examination Committee announces the examination results and the result of the graduation in the presence of the student.

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

The final grade as a result of completing the studies is calculated in accordance with the rules provided in the Study Regulations, using appropriate weights, i.e .:

- 0.6 for the average grade from studies,
- 0.2 for the diploma thesis grade,
- 0.2 for the grade for the master's diploma examination along with the grade for the general master's degree examination; with weights of 0.3 (for the presentation of the

thesis and discussion of the thesis) and 0.7 for the result of the general written examination, respectively.

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

N/A