STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Resources of natural gases		**1010632211010636291**
Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanika i budowa maszyn	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Gas technology and renewable energy	**English**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
Second-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **1** Classes: **-** Laboratory: **-** Project/seminars: **-**		**1**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
(brak)	**(brak)**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences		**1 100%**
Technical sciences		**1 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowladge in the field of chemistry, physics, thermodynamics and geology
2	**Skills**	Student should have skills required to solve engineering problems with scientifically valid methodologies. Can effectively acquire the information from various sources including datasheets, literature and Internet
3	**Social competencies**	Knows the limitations of his or her own knowledge and skills, understands the non-technical aspects and results of engineering activity and their importance

Assumptions and objectives of the course:

To acquaint students with the theoretical and practical problems related to the mining and processing technology of natural gases

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has an extended knowledge in field of gas extraction. ? [K2A_W16] - [-]
2. Has general knowledge in the field of standardization, recommendations and EU directives, national, international and industry standards in mining of natural gases ? [K2A_W09] - [-]
3. Has the knowledge about the current developments in field of gas production ? [K2A_W12] - [-]
4. Has detailed knowledge about Polish gas system [K2A_W12] - [-]

Skills:

1. Is able to obtain information from the literature, internet, databases and other sources. - [-]
2. Can integrate the information to interpret and learn from them, create and justify opinions. - [K1A_U03] - [-]
3. Is able to freely use an international language in contacts with professionals from the same field of study.- [K2A_U01] - [-]

Social competencies:

1. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions. - [K2A_K02] - [-]
2. Is able to set priorities for realization of undertaken tasks. ? [K2A_K04] - [-]
3. Is able to interact in a group taking on the different roles. ? [K2A_K03] - [-]

Assessment methods of study outcomes
Lecture ? the written examination The evaluation of student knowledge will be held based on an answers on 5 questions from the material presented during the lectures.
Course description
Conventional sources of natural gases, non-conventional sources of natural gases, shale gas, tight gas, sources of natural gases in Poland, Europe and World, low calorific natural gases, methods of horizontal and vertical drilling, technical and economic aspects of the use of LNG, production process of LNG, transport and storage process of liquid natural gas , methods of diversification of gas supplies, major gas supplier in Poland and EU, gas hydrates, production of gaseous synthetic fuels, The technical and economic aspects of the recovery of helium and other trace gases from natural gas, Cryogenic process, low temperature processes of disintegration of gas, non-cryogenic process
Basic bibliography:
1. Jacek Molenda, GAZ ZIEMNY Paliwo i Surowiec 2. Wiliam Nuttall, Richard Clarke, Bartek Glowacki, The Future of Helium as a Natural Resource 3. Committee on Understanding the Impact of Selling the Helium Reserve; National Materials Advisory Board; National Research Council, Selling the Nation's Helium Reserve
Additional bibliography:
1. PN EN standard,

Result of average student's workload

Activity	**Time (working hours)**
1. Preparation for the lecture	5
2. Participation in the lecture	15
3. Fixing the lecture	15
4. Consultation for the lecture	2
5. Preparing to pass the lecture	10
6. Participation in the completion of the lecture	2

Student's workload

Source of workload	**hours**	**ECTS**
Total workload	49	1
Contact hours	19	0
Practical activities	0	0