STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Gas systems		**1010134281010137729**
Field of study	Profile of study (general academic, practical)	Year /Semester
Environmental Engineering Extramural First-	**general academic**	**4 / 8**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**elective**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**part-time**	
No. of hours		No. of credits
Lecture: **14** Classes: **12** Laboratory: **-** Project/seminars: **-**		**4**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
major	**from field**	
Education areas and fields of science and art		ECTS distribution (number and %)

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Fundamentals of combustion processes. Gas flows in pipes, pressure loss, pressure reduction. Pressure, pressure units. Basics of materials science.
2	**Skills**	Calculation of gas flow in pipes, knowledge about impact of pressure and temperature on gas properties.
3	**Social competencies**	Ability to work in team. Awareness of the need to continually update and supplement one's knowledge and skills.

Assumptions and objectives of the course:

To teach students basic information about construction, operation and design of complex medium and high pressure gas systems.

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

Knowledge:

1. Student knows how to calculate gas demands and gas flows in complex natural gas systems - [[K_W04, K_W05]]
2. Student has the knowledge about construction, design, operation and control of medium and high pressure natural gas systems - [[K_W05,K_W06,K_W07]]

Skills:

1. Student can calculate gas demand and gas flows i complex gas system - [[K_U13, K_U14]]
2. Student understands principles and is able to analyse operation of basic elements in complex gas system - [[K_U01,K_U03, K_U07,K_U13, K_U14]]

Social competencies:

1. Student is aware of the purpose and importance of complex gas systems - [[K_K02]]
2. Student understands the significance of team work in resolving theoretical and practical problems - [[K_K03]]

Assessment methods of study outcomes

Lecture: written test.
Seminars: written test.

Course description

Introduction to complex natural gas systems.

Calculations of gas demands.
Calculations and sizing of natural gas stations.
Pipeline metering stations.
Types and sources of natural gas.
Common hazards and relevant safety precautions.
New trends and technologies in complex natural gas systems.

Basic bibliography:

1. Bąkowski K.: Sieci gazowe, WNT, Warszawa, 1999
2. Łaciak M., Bezpieczeństwo eksploatacji urządzeń instalacji sieci gazowych, Rarbonus, 2010

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	14
2. Participation in seminars	12
3. Preparation for final tests	5

Student's workload

Source of workload	hours	ECTS
Total workload	46	4
Contact hours	26	3
Practical activities	12	1