



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Gas networks [S2EPiO1-TGiEO>SGiIE]

Course

Field of study	Year/Semester
Industrial and Renewable Energy Systems	1/1
Area of study (specialization)	Profile of study
Gas Technology and Renewable Energy	general academic
Level of study	Course offered in
second-cycle	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	0	0
Tutorials	Projects/seminars	
15	0	

Number of credit points

3,00

Coordinators

dr inż. Michał Gołębiewski
michal.golebiewski@put.poznan.pl

Lecturers

Prerequisites

Basic information on thermodynamics, heat transfer and fluid mechanics including the calculation of flow parameters in pipelines. Performing thermodynamic and flow calculations for selected fluid flow issues. The student is able to cooperate in a group, taking on different roles in it to solve the tasks set before him.

Course objective

Understanding the basic elements of gas network construction and methods of their design

Course-related learning outcomes

Knowledge:

- 1.knows the basic processes occurring in the life cycle of devices, facilities and technical systems used gas networks
- 2.student has deep knowledge of operational parameters impact on the efficiency of energy machines works in gas networks and their functioning of energy systems
- 3.student has knowledge of the negative impact of gas networks on the natural environment

Skills:

1. student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks in the field of gas networks
2. student is able to solve research and engineering tasks requiring the use of engineering standards and norms as well as the use of technologies appropriate for gas networks, using experience gained in a professional environment engaged in engineering activities
3. student is able to manage the work of the team in area of gas networks

Social competences:

1. student is ready to critically assess knowledge and received information in the field of gas networks
2. student is ready to think and act in an entrepreneurial way in the field of gas networks
3. student is ready to perform responsible professional roles, taking into account changing social needs, including:
 - development of the profession's achievements,
 - maintenance of the profession ethos,
 - compliance of professional development with ethics principles and introduce actions to comply with these principles

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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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.

Classes - final test and rewarding knowledge necessary for the accomplishment of the problems in the area of the subject

Programme content

Construction of low and high pressure gas transport systems, calculations of basic elements of gas station construction, gas stations, control systems, pipeline corrosion protection, explosion hazard zones, pipeline construction materials.

Course topics

Lecture:

1. Classification of gas networks
2. Materials used in the production of gas pipelines I
3. Materials used in the production of gas pipelines II
4. Methods of building gas pipelines I
5. Methods of building gas pipelines II
6. Inspection and pressure tests of gas pipelines
7. Inspection of gas pipelines I
8. Inspection of gas pipelines II
9. Rehabilitation of gas pipelines I
10. Rehabilitation of gas pipelines II
11. Gas stations - introduction
12. Safety elements of gas stations
13. Elements of pressure regulation and gas flow measurement
14. Methods of regulating gas stations

Exercises:

1. Hydraulic calculations of gas networks I
2. Hydraulic calculations of gas networks II
3. Strength calculations of gas pipelines I
4. Strength calculations of gas pipelines II
5. Calculations of security elements of gas stations
6. Calculations of pressure regulation elements of gas stations

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board.

Exercises: performing theoretical calculations on the board.

Bibliography

Basic

1. Tuliszka E.: Mechanika Płynów
2. Bąkowski K.: Sieci i instalacje gazowe
3. Andrzej Osiadacz: Stacje gazowe. Teoria, projektowanie, eksploatacja
4. Witalis Ratasiewicz: Stacje gazowe w systemach dostawy gazu, Poradnik; Polskie Zrzeszenie Inżynierów i Techników Sanitarnych
5. Grabowski H.: Poradnik techniczno-budowlany dla użytkowników sieci gazowej w systemie dystrybucyjnym. SITPNiG Ośrodek Szkolenia i Rzeczoznawstwa, Grupa Terenowa Rzeczoznawców w Poznaniu, 2011

Additional

1. Rybicki Cz., Łuczyński S.: Pomiary natężenia przepływu. Wiertnictwo Nafta Gaz, t. 24 z.2, 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	1,80
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,20