COURSE DESCRIPTION CARD - SYLLABUS

Course name
Preparation for scientific research [S2EPiO1-TGiEO>PdBN]

Course

Field of study
Industrial and Renewable Energy Systems

Year/Semester
2/3

Area of study (specialization)
Gas Technology and Renewable Energy

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other (e.g. online)
0

Tutorials
10

Projects/seminars
0

Number of credit points

16,00

Coordinators

Lecturers

Prerequisites

Student has knowledge about methods of analysis of selected thermodynamic, fluid mechanic, heat transfer and renewable energy phenomena, occurring in energy systems. Student should also have skills required to analyze simple energy systems in terms of energy production (combustion processes), heat energy transport, flow phenomena and impact on the natural environment including economical aspects.

Course objective

Preparation of the students for independent performance of the master"s thesis and for planning of scientific experiments.

Course-related learning outcomes

Knowledge:
knows the basic processes occurring in the life cycle of devices, facilities and technical systems used gas industry.
knows the principles of industrial property protection (including intellectual property) as well as economic and legal conditions of activities related to use of gaseous fuels i heat and electricity production.
has in-depth knowledge about methods of measurements of physical quantities characterizing of gas technology systems and automation systems used in control systems.

Skills:
is able to use his knowledge and skills to adapt existing or create new methods and tools to help solve typical engineering problems in gas industry.
is able to formulate and test hypotheses related to simple research problems in the fields of production and use of standard and nonstandard gaseous fuels
is able to design and conduct experiments and simulations in field of gas technology as well as process and interpret their results.

Social competences:
is ready to critically assess knowledge and received content.
is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert opinions in the event of difficulties in solving the problem yourself.
is ready to perform responsible professional roles, taking into account changing social needs, including: developing the profession"s achievements, maintaining the ethos of the profession, compliance with and development of the principles of professional ethics and actions to comply with these principles.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Tutorials: the skills acquired during the tutorials classes will be assessed on the basis of the solution to the scientific problem presented by the student during the last class presentation, the grade issued by the thesis supervisor.

Programme content

Topic content in accordance with the detailed tasks given in the topic card of the master"s thesis.

Teaching methods

Tutorials: multimedia presentation illustrated with examples given on a blackboard and performance of tasks given by the teacher - practical exercises

Bibliography

Basic
Leszek W., Badania empiryczne, wyd. ITE, Radom 1997.
Korzyński M., Metodyka eksperymentu. Wydawnictwo NT, Warszawa 2006
Polański Z., Planowanie doświadczeń w technice. PWN, Warszawa
Additional
Leszek W. Nieempiryczne procedury badawcze w naukach przyrodniczych i technicznych. Wydawnictwo ITE, Radom 1999.

Breakdown of average student's workload

	Hours	ECTS
Total workload	480	16,00
Classes requiring direct contact with the teacher	10	0,30
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	470	15,70