



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Environmental Engineering

Course

Field of study

Year/Semester

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

english

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

6

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Rafał Ślefarski

Responsible for the course/lecturer:

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Faculty of Environmental Engineering and Energetic

ul. Piotrowo 3 60-965 Poznań

Prerequisites

Basic knowledge of thermodynamics, mathematics and biology. Has the knowledge of the surrounding environment and the construction of power machines. Can solve engineering problems with the use of scientific methods and find relevant information in literature, on the Internet, in data bases, and in other sources .

Course objective

To acquaint students with the knowledge about problems of environmental protection in energy industry as well as in renewable energy industry.



Course-related learning outcomes

Knowledge

Has knowledge about the development directions of energy technologies and renewable energy sources as well as new standards of environmental protection

Knows legal issues related to the design and use of energetic systems especially in field of environmental engineering technologies.

Knows the main development trends in the field of environmentally friendly energy technologies.

Knows the main technology and construction of devices used in industry to protect environment.

Skills

Is able to notice systemic and non-technical aspects, including ethical ones when formulating and solving engineering tasks in the field of Industrial Energy related to environment protection

Is able to critically analyze the functioning of existing technical solutions in the energy industry and evaluate these solutions in terms of environmental impact

Is able to lead a debate in the field of shaping knowledge on topics related to environmental protection

Is able to perform basic measurement system for environmental protection technology

Social competences

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

He is ready to fulfill social obligations, inspire and organize activities for the social environment

He is ready to critically assess his knowledge and received content, also in terms of the impact of technology on the natural environment

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by 45-minutes test carried out during the last lectures. Each test consists of 5 questions (open), variously scored. Passing threshold: 50% of points. Final issues on the basis of which questions are prepared will be sent to students by e-mail using the university e-mail system.

Skills acquired as part of the laboratory classes will be verified basis on the final test, consisting of 5-7 tasks differently scored depending on their level of difficulty and based on the developed reports from laboratory tasks. Passing threshold: 50% of points.

Programme content

Formation of toxic components and pollutants during combustion process, high efficiency and low emission combustion gas technology, alternative fuel gases, regulations on environmental protection,



methods of destruction process of VOC, flameless combustion, primary and secondary methods of reduction of toxic compounds during the combustion processes, zonal volumetric combustion, emission from agriculture, local emission, preparing of environmental survey, economical and ecological impact of investment on environmental

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Laboratory exercises: multimedia presentation and performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

Dobski, T. Combustion Gases in Modern Technologies, 2scd Ed., Poznan University of Technology

Molenda J. Steczko K. Ochrona środowiska w gazownictwie i użytkowaniu gazu

John C. Mycock: Handbook of air pollution control engineering and technology

Hiroshi T., Gupta A.: High Temperature Air Combustion

Joachim G. Wunning: Handbook of Burner Technology for Industrial Furnaces

Additional

EU standards

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for tests, preparing for the laboratory, preparation the laboratory reports, consultation) ¹	115	5,0

¹ delete or add other activities as appropriate