COURSE DESCRIPTION CARD - SYLLABUS

Course name
Heat and Power Technology

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

Other (e.g. online)

Tutorials

Projects/seminars
15

Number of credit points

6

Lecturers

Responsible for the course/lecturer:
dr hab. inż. Rafał Ślefarski

email: rafal.slefarski@put.poznan.pl

tel. 616652218

Faculty of Environmental Engineering and Energetic

ul. Piotrowo 3 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Basic knowledge in the field of mechanics, thermodynamics and fluid mechanics and knowledge about construction of energetic machines. Student should also have skills required to solve engineering problems with scientifically valid methodologies. Can effectively acquire the information from various sources including datasheets, literature and Internet.

Course objective

To acquaint students with the basic theoretical and practical aspects related to the modern technologies in fields of heat and power production.

Course-related learning outcomes

Knowledge

Has comprehensive knowledge about construction of devices and machines used in heat and power production.

Has the knowledge about the current developments in an industrial heat and power production

Has a basic knowledge of specific machine work technologies energy sector

Has an extended knowledge on low emission and high efficiency technologies used industry

Skills

Is able to obtain information from the literature, internet, databases and other sources. Can integrate the information to interpret and solve an engineering problems related to energy sector.

Is able to plan and carry out experimental studies of specific processes taking place inenergy industry sectors.

Is able to perform basic measurements of mechanical properties on a selected machine using modern measurement systems.

Is able to assess potential negative impacts for the natural environment and humans, originating from the designed machine or technology

Social competences

Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment, is aware of responsibility for decisions.

Can define priorities when realizing a goal set on one's own or by other people.

Can think and act in a creative and entrepreneurial manner

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 project classes will be verified based on the assessment of the report prepared by the student with the solution of the engineering task. Passing threshold: 50% of points

Programme content

energy balance of energetic machines and devices, introduction to combustion process of fossil fuels (natural gas, syngas, biomass, coal), heat exchange processes (convection, radiation, conduction), thermodynamic cycles related to heat and electricity production, non-CO2 energetic cycles, analysis of impact of enery production on natural enviroment

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Project: solving of an engineering problems with using databases and numerical programs.

Bibliography

Basic

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

2. Warnatz J., Maas U., Dibble R.W.: Combustion, Sprinter-Verlag, Berlin, Heidelberg 1999,

3. Arthur H. Lefebvre, Dilip R. Ballal, Gas turbine. Combustion. Alternative Fuels and Emissions

4. Meherwan P. Boyce: Gas Turbine Engineering Handbook

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, project preparation, consultation) [1]	115	5,0

[1] delete or add other activities as appropriate