COURSE DESCRIPTION CARD - SYLLABUS

Course name

Elective course E: Heat Production in Industry

Course

Field of study

Power Engineering

Year/Semester

5/9

Area of study (specialization)

Industrial thermal power engineering

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

10

Other (e.g. online)

0

Tutorials

0

Projects/seminars

10

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

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tel. 616652218

Faculty of Environmental Engineering and Energetic

ul. Piotrowo 3 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student has basic knowledge in the field of mechanics, thermodynamics and fluid mechanics and knowledge about construction of energetic machines fired by fossil fuels. He has skills required to prepare and presents the results of solutions of engineering problems using specialist terminology.

Course objective

To acquaint students with knowledge about modern energetic cycles, energy balances of energetic machines and devices, preparing students for designing process of heat energy systems such as turbine, compressors, heat exchangers. To acquaint students with practical knowledge about construction of engines worked in energetic sectors.

Course-related learning outcomes

Knowledge

Student has comprehensive knowledge about phenomena existing in chemistry, combustion processes, gasification processes of renewable and fossil fuels necessary to understand the energetic systems

Student has theoretical knowledge about conversion technologies of primary energy in heat and electricity, known construction and exploitation rules of energetic machines

Student has extended knowledge in area of electricity supply systems, heat supply systems in macro and micro networks.

Skills

Is able to use a experimental methods and measurements devices for description of thermodynamics parameters described energetic systems and processes

Is able to solve problems in fields of designing process of energetic systems, and understands the importance and impact of non-technical aspects of f mechanical engineering activities and its impact on the environment and responsibility for own decisions

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 able to obtain information from the literature, internet, databases and other sources. Can integrate the information to interpret and learn from them, create and justify opinions.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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.

Laboratory classes - evaluation reports made exercises and final test (10 questions, min. 51%)

Project - presentation of solutions to the scientific problem in the form of a report

Programme content

Compression machines used in heat and power industry, heat exchangers in heat production, boilers construction, evaporators and condenser systems, thermodynamics cycles in heat production, water steam cycles, gas cycles and advanced cycles.

Teaching methods

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

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

Laboratory: solving practical tasks delivered by a teacher.

Bibliography

Basic

R. Janiczek – Eksploatacja elektrowni parowych, WNT W-wa 1980,

S. Perycz – Turbiny parowe i gazowe, Wyd. Pol. Gdańskiej,1982

T. Chmielniak – Turbiny cieplne, Wyd. Pol. Śląskiej, 2004

T. Chmielniak – Technologie energetyczne, Wyd. Pol. Śląskiej,2004

Additional

S. Kruczek: Kotły, konstrukcje i obliczenia

J. Skorek: Gazowe układy kogeneracyjne,

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	40	1,6
Student's own work (literature studies, preparation for laboratory classes, preparation for tests/exam, project preparation) [1]	85	3,4

[1] delete or add other activities as appropriate