



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Work of generating sources in the power system

Course

Field of study

Year/Semester

Power Engineering

2/3

Area of study (specialization)

Profile of study

Electrical Power Engineering

general academic

Level of study

Course offered in

Second-cycle studies

Polish

Form of study

Requirements

full-time

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

15

0

Tutorials

Projects/seminars

15

15

Number of credit points

6

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Wydział Inżynierii Środowiska i Energetyki

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Prerequisites

Basic knowledge of: construction and operation of generating sources used in the power industry, mechanics, fluid mechanics, basics of metrology. Knowledge of the basic principles of energy installations operation. Knowledge of the principles of operation of basic machine parts and construction of basic manufacturing equipment. Possessing the skills of effective self-education in a field related to the chosen field of study. Awareness of the need to expand their competences, readiness to cooperate within a team

Course objective

Acquaintance with the principles of operation of power plants, combined heat and power plants and distributed sources and their participation in covering variable loads of the power system



Course-related learning outcomes

Knowledge

1. The student knows the role of various types of power plants in the operation of the power system. He knows the energy characteristics of generating sources
2. Student knows and understands the concepts of power plant availability and reliability structure of devices in a power plant
3. Student has general knowledge on how to optimize the work of generating sources in the power system
4. The student has knowledge of development trends in the field of work of generating sources in the power system, including distributed generation

Skills

1. As a result of the course the student will be able to analyze the operation of the power plant in the power system - economic distribution of loads, and the selection of a set of generating units
2. Student is able to apply the basic principles of correct operation of generating sources in the power system

Social competences

1. The student is aware of the impact of the structure of generating sources on the energy security of the national power system.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

assessment of knowledge and skills demonstrated during the written exam,

Laboratory classes:

ongoing checking of knowledge necessary to implement the problems posed in a given area of laboratory tasks, assessment of the report of the exercise.

Tutorials:

test and rewarding knowledge necessary to implement the problems raised,

assessment of knowledge and skills related to the implementation of the exercise task.

Projects:



assessment of knowledge and skills related to the implementation of the project task,
assessment of the completed design task.

Getting extra points for activity during classes, especially for:

continuous assessment, during each class - rewarding the increase in the ability to use known principles and methods,

proposing to discuss additional aspects of the issue;

notes related to the improvement of teaching materials;

aesthetic care of prepared reports and tasks.

Programme content

Lecture:

The role of various types of power plants in the operation of the power system. Energy characteristics of generating sources. Power plant operation in the power system - economical load distribution, selection of a set of generating units. Power plant availability. Power plant reliability structures. Conditions for connecting generating units to the power grid.

Laboratory classes:

modeling and analysis of the work of selected generating sources in the matlab simulink environment

Tutorials:

Characteristics of relative increments of individual elements of the power block

Projects:

design task related to determining operational indicators of selected generating sources

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Laboratory classes: classes at computer stations

Tutorials: solving tasks at the board

Project: independent execution of a design task



Bibliography

Basic

1. Praca elektrowni w systemie elektroenergetycznym, Gładys H., Matla R., WNT, W-wa , 1995
2. Eksploatacja elektrowni parowych, R.Janiczek, WNT , W-wa , 1
3. Niekonwencjonalne źródła energii, J. Gronowicz, WITE-PIB Radom-Poznań 2008
4. Rozproszone źródła energii w systemie elektroenergetycznym, R Janiczek, M. Przygocki, WPS Gliwice 2010

Additional

1. Elektrownie, D.Laudyn, M.Pawlik, F.Strzelczyk, WNT, W-wa , 2000
2. Technologie energetyczne, T. J. Chmielniak, Wydawnictwo politechniki Śląskiej, Gliwice 2004

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|------|
| Total workload | 172 | 6,0 |
| Classes requiring direct contact with the teacher | 107 | 4,0 |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹ | 65 | 2,0 |

¹ delete or add other activities as appropriate