COURSE DESCRIPTION CARD - SYLLABUS

Course name
Problems of energy security

Course

Field of study
Power Engineering
Year/Semester
1/2
Area of study (specialization)
-
Profile of study
general academic
Level of study
Second-cycle studies
Course offered in
Polish
Form of study
full-time
Requirements
compulsory

Number of hours

Lecture
15
Laboratory classes
0
Other (e.g. online)
0
Tutorials
0
Projects/seminars
15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:
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Prerequisites

Basic knowledge in electrical power engineering, thermal energy, energy management and fuels and their use. Ability to self-study effectively topics related to the chosen field of study. Awareness of the need to extend competences, readiness to cooperate within a team.

Course objective

Understanding European Union's strategy for sustainable development considering the use of the environment, renewable energy sources, energy efficiency as well as resulting actions undertaken in Poland. Knowldge on the measures undertaken to implement such strategy. Gaining knowledge in terms of energy systems' features that detemine the energy security level as well as existing threats to the security of electricy supply and measures to counteract them.

Course-related learning outcomes

Knowledge

1. Student has the knowledge concerning energy security, emerging threats and ways to increase the security level.

Skills

1. Student is able to assess the usefulness of strategic assumptions supporitng the decisions on energy processes.

2. Student is able to analyse operating states of the power system in terms of energy security and reliability of electricity supply.

Social competences

1. Student is able to identify and asses the problems related to energy security of the country.

2. Student is able to search for solutions concerning strategies for sustainable development of the energy sector and ensuring secure energy supply.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- knowledge and skills assessment through a problem-based written test,
- continuous assessment of student's skills and competences during each class through discussions on current problems related to energy security (rewarding attendance and active participation in the classes).

Project:

- assessment knowledge and skills concerning the project tasks, evaluation of the reports on completed tasks,
- additional points for active paritcipation during classes, in particular for the ability to cooperate within a team that handles that project task.

Programme content

Lecture:

Fuel resources and modern technologies for energy generation and transmission. Electricity and heat generation costs including the environmental impact (CO2, SO2). Sustainable European Union's energy policy for reducing harmful emissions, supporting renewable energy sources and improving energy efiiciency. Diversification of energy sources regarding different energy generation technologies. Legal regulations supporting the development of sustainable energy resources. Role of ENTSO-E in ensuring energy security. Security of gas supply. Threats to energy supply security involving different energy carriers, threats assessment and limitation methods. Ways of ensuring local electricity supply safety using backup power systems.

Project:
Diversification of energy sources regarding different energy generation technologies. Threats to energy supply security involving different energy carriers and methods of the assessment and limitation. Ways of ensuring local electricity supply safety using backup power systems.

Teaching methods

Lecture: multimedia presentation - informational and problem lectures supplemented with examples presented on the board, elements of brainstorming and discussion

Project: multimedia presentation with calculation exaples presented on the board, problem methods, expert table method, solving project tasks individually and in groups

Bibliography

Basic
1. Dołęga W., Planowanie rozwoju sieciowej infrastruktury elektroenergetycznej w aspekcie bezpieczeństwa dostaw energii i bezpieczeństwa ekologicznego, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2013
2. Gryz J., Podraza A., Ruszel M., Bezpieczeństwo energetyczne. Koncepcje, wyzwania, interesy. Wydawnictwo Naukowe PWN, Warszawa 2018
3. Janusz P., Szczerbowski R., Zaleski P., Istotne aspekty bezpieczeństwa energetycznego Polski, Texter, Warszawa 2017
4. Kaczmarski M., Bezpieczeństwo energetyczne Unii Europejskiej, Wydawnictwa Akademickie i Profesjonalne, Warszawa 2010
5. Pach-Gurgul A., Jednolity rynek energii elektrycznej w Unii Europejskiej w kontekście bezpieczeństwa energetycznego Polski, Wydawnictwo Difin, Warszawa 2012
6. Wiatr J., Orzechowski M., Poradnik projektanta elektryka: podstawy zasilania budynków mieszkalnych, użyteczności publicznej i innych obiektów nieprzemysłowych w energię elektryczną z przykładowymi projektami oraz przepisami prawnymi na płycie CD, Dom Wydawniczy Medium, Warszawa 2012

Additional
1. Bartodziej G., Tomaszewski M., Polityka energetyczna i bezpieczeństwo energetyczne, Wydawnictwo Federacji Stowarzyszeń Naukowo-Technicznych Energetyka i Środowisko, Warszawa, 2009
2. Kowalak R., Malkowski R., Szczerba Z., Zajczyk R., Automatyka systemowa a bezpieczeństwo energetyczne kraju. Węzły sieci przesyłowej i rozdzielczej. Tom 3, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2013
3. Pawlik M., Strzelczyk F., Elektrownie, WNT Warszawa 2012, 2017
4. Poskrobko B., Zrównoważony rozwój gospodarki opartej na wiedzy, Wydawnictwo Wyższej Szkoły Ekonomicznej w Białymstoku, Białystok 2009
5. Sutkowski T., Rezerwowe i bezprzerwowe zasilanie w energię elektryczną; urządzenia i układy, ESP COSiW, 2007
6. Wojtkowska-Łodej G., Uwarunkowania rozwoju energetyki w zakresie polityki energetycznej i

regulacyjnej, ELIPSA Warszawawa 2016

7. Załącznik do Decyzji wykonawczej Komisji (UE) 2017/1442 z dnia 31 lipca 2017 r. ustanawiającej konkluzje dotyczące najlepszych dostępnych technik (BAT) w odniesieniu do dużych obiektów energetycznego spalania zgodnie z dyrektywą Parlamentu Europejskiego i Rady 2010/75/UE

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for classes and tests, working on project tasks) [1]	25	1,0

[1] delete or add other activities as appropriate