SYLLABUS

Name: *Renewable Energy Management*
Name in Polish: Zarządzanie energią odnawialną
Name in English: *Renewable Energy Management*

Information on course:

Course offered by department:	Faculty of Organisation and Management
Course for department:	Silesian University of Technology
Study level and form:	Bechelor's degree, Full-time
Term:	winter semester 2026/2027
Coordinator of course edition:	Tomasz Wałek Ph.D., Eng.

Default type of course examination report:

PASS

Language:

English

Course homepage:

https://platforma.polsl.pl/roz/

ECTS

3

Short description:

The aim of the course is to familiarize students with different types of renewable energy sources indicating their performance parameters and energy efficiency, taking into account the environmental conditions necessary for energy production in each source. The course also aims to indicate the possibilities of combining different renewable and conventional sources and managing them in a way that allows prioritizing the sources with the highest energy efficiency at a given moment of the day/year.

Description:

Lecture:
1. Conventional Global Energy Systems.
2. Decarbonisation and Energy System Transitions.
3. Wind, Hydro and Marine Energy Systems.
4. Solar, Bioenergy and Geothermal Systems.
5. Energy Management, Efficiency and Auditing.
6. Concept of the Virtual Power Plant.
Project:
1. Building Energy Demand Assessment.
2. Energy Sources Combination.
3. Economy of Energy Solutions.

The number of hours with the direct participation of academic teachers or other persons conducting classes and students:
Lecture: 30
Project: 30

Student's own work:
Preparation for the test: 10
Preparation of the project: 20

Total workload: 90

Bibliography:

1. Koushika M.D., Solar Energy Principles and Applications, IBT publications, 1988.
2. Mital K.M, Biogas systems: Priciples and Applications, New Age International Publishers Ltd., 1996
3. Venkata Ramana P and Srinivas S.N., Biomass Energy Systems, TERI, 1996.
4. Rai, G.D., Non-Conventional Sources of Energy, Khanna Publishers, Delhi 1995.
5. Rao S, Parulekar B.B, Energy Technology – Non conventional, Renewable and Conventional, Khanna Publishers, 1999.
6. H.G. Stoll, Least Cost Electrical Utility/Planning, John Wiley & Sons, 1989.
7. Walek T., Kaleta P., Energy management in buildings - supplying buildings with heat, cooling and power using gas fuels [in Polish], INSTAL, 2017, 6, 8-14,
8. Walek T., New model of cost allocation for micro-cogeneration systems applied in multi-family buildings - with standard and new-type multi-source energy meters, Energy, 2023, 125480.

Learning outcomes:

Knowledge: (knows and understands)
K1A_W1 - Advanced issues in the field of mathematics, physics, statistics and areas of engineering and technical sciences useful for formulating and solving typical engineering tasks,
K1A_W3 - Basic engineering processes and technologies in the life cycle of technical equipment, objects and systems and ways of solving typical engineering tasks, particularly in relation to the organization of production processes and production management,
K1A_W7 - Fundamental problems of contemporary civilization relevant to the production engineering,
Skills: (is able to)
K1A_U4 - When identifying and formulating specifications for engineering tasks and solving them:
- select and use analytical, simulation and experimental methods, including computer-aided methods,
- recognize their system and non-technical aspects, including ethical aspects
- make preliminary economic assessment of the proposed solutions and engineering actions taken,
- analyze technology transfer and innovation,
K1A_U5 - Make a critical analysis of the functioning of existing technical and technological solutions in production systems function, evaluate these solutions and suggest appropriate improvements and innovations in this regard,
Social competence: (is ready for)
K1A_K2 - Fulfilling social obligations, co-organizing activities for the social environment, initiating activities for the public interest, thinking and acting in an entrepreneurial manner.

Assessment methods and assessment criteria:

Lectures – written single-choice test.
Project – written reports.

Practical placement: