Nazwa w jęz. angielskim: Waste to energy

Dane dotyczące zajęć:
Information on course:

Jednostka oferująca: Wydział Inżynierii Środowiska i Energetyki // dr inż. Marcin Landrat
Course offered by: Faculty of Energy and Environmental Engineering // dr inż. Marcin Landrat

Język wykładowy:

angielski

Language:

English

Strona WWW:
Course homepage:

Skrócony opis:

Short description:

The course is aimed at delivering the information about modern technologies and environmental restrictions of recovering energy from waste. The course covers the following general topics: solid waste composition and quantities, classification of fuels, energy potential in waste, waste management and segregation, waste to energy technology, emission and energy balance of waste incineration and Refuse Derived Fuel (RDF or SRF) technology.

Opis:

Description:

The course include lecture and laboratories.
Lecture covers:

1. Waste management and segregation,
2. Solid waste composition and quantities,
3. Classification of fuels,
4. Energy potential in waste,
5. Anaerobic digestion, biogas,
6. Waste to energy technology,
7. Emission and energy balance of waste incineration,
8. Refuse Derived Fuel (RDF or SRF) technology.

Laboratories cover:
The second part of course is done combining project and laboratory classes. It is based on the research of waste substances to determine their fuel properties:

1. Determination of carbon and hydrogen content
2. Determination of sulfur content
3. Determination of combustible and noncombustible parts content
4. Determination of moisture content
5. Determination of heat of combustion and calorific value
6. Determination of volatiles content
7. Determination of chlorium content

Based on the knowledge acquired from lab research, on the tested waste, students propose and develop a method of managing these waste.
Students would require not only to use the knowledge in the field of waste to energy but also the skills of analysis the legal and economic aspects on this subject. And most importantly, they will gain the ability to work independently in a chemical laboratory, which can be useful in later professional career. Students will be devided into small groups cooperating with each other to achieve a common end result

Lectures: 15h

Laboratories: 15 h
Number of ECTS credits: 2

Literatura:

Bibliography:

1. Rogoff M.J., Screve M.: Waste to Energy. Technologies and Project Implementation. Elsevier 2011.
2. Hanjalic K., van de Krol R., Lekic A. (editors): Sustainable Energy Technologies. Springer 2008.
3. Wandrasz J., Pikoń K., Czekalska Z. (editors): Waste to Energy and Environment. Silesian University of Technology. 2010.
4. Wilk R.: Clean combustion technologies. Gliwice. 2002.
5. Scientific journals availabale in university network (Scopus, Science direct etc.)

Efekty uczenia się:

Learning outcomes:

Knowledge
Student:
K2A_W06 demonstrates deep knowledge of principles of conducting physical measurements and describing their results, types of measurement uncertainties, ways of their determination and expression.
K2A_W16 is familiar with the principles of using the waste-to-energy process.

Skills
Student can:
K2A_U07 conduct physical measurements, as well as describe and present their results in a clear way.
K2A_U17 select fuel types for the needs of energy processes being implemented and/or designed.

Metody i kryteria oceniania:

Assessment methods and assessment criteria:

Lecture:
Completion of the lecture is based on a positive essay assessment.
Laboratories:
Completion of the laboratory is based on a positive assessment of the final test report and oral presentation.
The final grade of the course is the value of the arithmetic mean of the grade of the lecture and the grade of laboratories.

Przynależność do grup przedmiotów w cyklach:
Element of course groups in various terms:

Opis grupy przedmiotów Course group description	Cykl pocz. First term	Cykl kon. Last term
przedmioty obieralne studia stacjonarne i niestacjonarne stopień studiów – dowolny kierunek studiów – dowolny, semestr dowolny elective courses full-time and part-time studies degree - any field of study - any semester - any	2023/2024	