

Course title: **Biofuels and bioresources** – selectable / regular course (spring)

Number of contact hours: 45 hours Exam. (15h lectures, 30h laboratories)

ETCS credits: 4

Course description: The lecture reviews the liquid biofuels diversity on a background of other renewable energy sources, highlighting their role in the global energy balance. The basics of Polish, European and worldwide legislation regulating the production, properties and distribution of biofuels will be given together with the most typical classification based on the physical state (biogas, biomass and liquid biofuels) and the generation (Ist, IIrd, IIIrd and IVth generation); the analysis and comparison of potential raw-materials and production technologies, as well as the perspectives for further development will be discussed. The laboratories consist of exercises on biodiesel production and characterization, bioethanol synthesis and chromatographic analysis of the alcohol concentration, methane production by anaerobic fermentation of biomass.

Education effects:

- knowledge: student knows the most important types of bioresources; knows the methods of biofuels synthesis and recognize their critical properties; is familiar with existing law-regulations
- skills: student can synthesize various types of biofuels and characterize them in respect of current EU standards; can use the specific apparatus dedicated for biofuels characterization; knows how to prepare high-quality research report from performed laboratory exercises
- social: student is able to work independently and in the group both at the laboratories and during preparation of the report; understand the reason of fulfilling the biofuels standards

Literature: [1] Knothe G., Van Gerpen J., Krahl J — The Biodiesel Handbook, Illinois, 2005, AOCS Press
[2] Olsson L.: — Biofuels, Berlin Heidelberg, 2007, Springer

Assessment method: Final test, completing the laboratories (presence and delivering of reports from each performed exercise)

Prerequisites: Basic knowledge in organic chemistry and technology

Primary target group: All specialties students

Lecturer: dr hab. inż. E.Skrzyńska

Contact person: dr hab. inż. E.Skrzyńska e-mail: eskrzynska@pk.edu.pl