

**Course title:** **Concept of biorefinery and platform chemicals – selectable course**

**Institute/Division:** **FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY**

**Erasmus subject code:** WITCh ICHIP oIIS B3

**Number of contact hours:** 15 hours (15h seminars)

**Course duration:** 1 semester (spring or fall)

**ETCS credits:** **2**

**Course description:** The seminar presents the idea of the biorefinery and current strategies in the integrated production of energy and chemicals from biomass. The topic is highlighted on the examples of fatty-acid and lignocellulose materials processing. The idea of chemical platform will be discussed on selected examples of C3-C6 components, which by chemical or biochemical transformations can be converted to valuable intermediates. As a result of the course the student should be able to identify the trends and perspectives in the chemical market based on biomass, and also know the basics of so called "balanced biomass economy". Information about the most important platform chemicals: glycerol, 3-hydroxypropionic acid, aspartic, fumaric, succinic and malic acids, 3-hydroxybutyrolactone, xylitol, glutamic, itaconic, levulinic, glutaric acids, 2,5-furan-dicarboxylic acid and sorbitol. Explanation of their most important physicochemical properties and sources.

**Literature:** [1] H.R.Ghatak — Biorefineries from the perspective of sustainability: Feedstocks, products, and processes, RenewSusEnergy Rev. 15 (2011) 4042  
[2 ] Ayhan Demirbas — Biorefineries For Biomass Upgrading Facilities,, Springer, 2010, Springer  
[3 ] Francesco Cherubini — The biorefinery concept: Using biomass instead of oil for producing energy and chemicals, Science Direct, 2010, Energy Conversion and Management 51 (2010) 14121421

**Assessment method:** **Final test**

**Prerequisites:** **Basic knowledge on organic chemistry and technology**

**Primary target group:** **all specialties**

**Lecturer:** dr inż. Elżbieta Skrzyńska

**Contact person:** dr inż. Elżbieta Skrzyńska, e-mail: eskrzynska@pk.edu.pl

**Deadline for application:** **15<sup>th</sup> of January for students applying for spring semester, 30<sup>th</sup> of August for students applying for winter semester**

**Remarks:** **The course will start for at least 3-5 foreign students**