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| Course title: | Concept of biorefinery and platform chemicals |
| Institute/Division: | FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY |
| Number of contact hours: | 15 hours (15 h seminar) |
| Course duration: | 1 semester (6 th semester of regular I cycle studies - spring) |
| 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-di-carboxylic acid and sorbitol. Explanation of their most important physicochemical properties and sources. |
| Education effects : | <ul style="list-style-type: none"> - knowledge: As a result of the course students should know what is a biorefinery and what kind of raw materials can be included in an integrated energy production and chemicals. Has well arranged knowledge in the field of industrial biotechnology, renewable sources of energy, biomaterials and biorefineries - skills: s able to prepare in English a well-documented report and present his findings in front of the group - social: on the basis of changes in the field of biorefineries concepts, understands the need for continuous studying, broadening the knowledge and skills |
| Literature: | <p>[1] H.R.Ghatak — Biorefineries from the perspective of sustainability: Feedstocks, products, and processes, <i>RenewSusEnergy Rev.</i> 15 (2011) 4042</p> <p>[2] Ayhan Demirbas — Biorefineries For Biomass Upgrading Facilities,, Springer, 2010, Springer</p> <p>[3] Francesco Cherubini — The biorefinery concept: Using biomass instead of oil for producing energy and chemicals, <i>Science Direct</i>, 2010, <i>Energy Conversion and Management</i> 51 (2010) 14121421</p> |
| Assessment method: | Final test, presentations |
| Prerequisites: | Basic knowledge in organic and inorganic chemistry and technology. |
| Primary target group: | Students from all specialties |
| Lecturer: | dr hab. inż. Elżbieta Skrzyńska |
| Contact person: | dr hab. inż. Elżbieta Skrzyńska, e-mail: eskrzynska@pk.edu.pl |
| Remarks: | The course is selectable |