

**Course title: Raw materials and processes of organic chemical technology****Institute/Division: FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY****Number of contact hours: 75 hours** (45 h lectures & 15 h exercises & 15 h projects)**Course duration: 1 semester** (5<sup>th</sup> semester of regular I cycle studies - fall)**ETCS credits: 6**

**Course description:** The course covers the basics and also more advanced topics on specific aspects of organic chemical technology such as: chemical process industries, raw material for organic chemical industries, most important products and intermediers of the organic chemical industry, basic principles of unit processes and unit operations, in organic chemical industries, coal and coal as chemical feed stock, coal carbonization and coke oven plant, gasification of coal, petrocoke and biomass, petroleum refinery (status of petroleum refinery, crude oil and natural gas origin, occurrence, exploration, drilling and processing, fuel norms, evaluation of crude oil, petroleum products and petrochemicals, petrochemical industry and its structure), alkylation processes, acylating processes, halogenation, nitration, hydrogenation processes, phosgenation, oxidation processes, sulfonation and sulfation, diazotization and azo coupling, selective conversion of biomass into organic chemicals, polymerization processes.

**Exercises:** Material balance of the process. Thermal balance of the process. Choosing the concept of chemical analysis of selected processes. Process technology concept analysis of selected technologies.

**Project:** The project of obtaining a selected large-volume product from natural raw materials or basic raw materials, including: chemical process concepts, process stoichiometry model, technological process concepts (description of basic processes), thermodynamic process analysis, material process balance, technological scheme.

**Education effects :**

- **knowledge** : student knows the most important raw materials and processes in organic chemical technology
- **skills**: student use the literature and databases to find necessary information and prepare a technological project of the selected processes in organic chemical technology
- **social**: student is able to work independently and in the group when solving the problems related to organic technology

**Literature:**

- [1] Kirk-Othmer (Ed.): Kirk-Othmer Encyclopedia of Chemical Technology, 5<sup>th</sup> Edition, John Wiley & Sons, Inc., 2007.
- [2] Hans-Jürgen Arpe: Industrial Organic Chemistry, 5th Edition, John Wiley & Sons, Inc., 2010.
- [3] James G. Speight: The Chemistry and Technology of Petroleum, 5th Edition, CRC Press, 2014.
- [4] Hobson, G.D., Pohl, W., "Modern Petroleum Technology", Vol. I & II, 5th edition, John Wiley & Sons, New York, 1986.
- [5] I. Czekaj, N. Sobuś, Nano-design of zeolite-based catalysts for selective conversion of biomass into chemicals, CUT Publishing House, Cracow 2018.

**Assessment method:** Exam / projects / final test**Prerequisites:** Basic course on general, inorganic and organic chemistry.**Primary target group:** Students from all specialties**Lecturer:** **dr hab. inż. Izabela Czekaj, prof. PK, dr hab. inż. Przemysław Jodłowski, dr Adam Węgrzynowicz****Contact person:** dr hab. inż. Izabela Czekaj, prof. PK (e-mail: iczekaj@chemia.pk.edu.pl)  
dr hab. inż. Przemysław Jodłowski (pjodlowski@pk.edu.pl)  
dr Adam Węgrzynowicz (vinnicki@chemia.pk.edu.pl)**Remarks:** Regular course