Course title: **Fundamentals of chemical engineering**

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

Number of contact hours: **60 hours** (15 h lectures & 15 h exercises & 30 h projects)
Course duration: 1 semester (5th semester of regular I cycle studies - fall)
ETCS credits: **5**

Course description:
The course covers the basics of heat transfer, fluid flow, mass transfer and separations for physical, chemical, metallurgical and biological processes. During the course students will extend knowledge of basic engineering calculations, will understand principles of conservation of mass and energy to determine the material and energy requirements of a process. Course explain the concept of unit operations and its importance in chemical engineering and also provide a framework and problem solving approach for complex engineering calculations.

Education effects :
- knowledge: Student knows basics of heat transfer, fluid flow, mass transfer and separations for physical, chemical, metallurgical and biological processes. Student knows extended basic engineering calculations, process classification and them analysis and the concept of unit operations. Student knows a framework and problem solving approach for complex engineering calculations. Student knows principles of conservation of mass and energy to determine the material and energy requirements of a process. Student knows preliminary of process design considerations.
- skills: Student can explain the concept of unit operations and its importance in chemical engineering. Student can convert data between different unit systems and describe and classify processes in chemical engineering. Student perform simple design calculations. Student can identify material and energy requirements of processes.
- social: Student is able to work independently and in the group when solving the problems related to chemical engineering

Literature:
[1] Himmelblau DM, *Basic Principles and Calculations in Chemical Engineering*, 6th Edition, Prentice-Hall, 1996.
[2] W. Ciesielczyk, K. Kupiec, *Chemical engineering calculations*, Kraków: Politechnika Krakowska im. Tadeusza Kościuszki, 2014.
[3] Yunus A. Cengel, Afshin J. Ghajar, *Heat and Mass Transfer: Fundamentals and Applications*, McGraw-Hill Education, New York, 2015.
[4] R. Serth, T. Lestina, *Process Heat Transfer*, Academic Press, 2014

Assessment method: Exam, projects, tests
Prerequisites: Basic course on general, inorganic and organic chemistry.
Primary target group: Students from all specialties

Lecturer: **dr inż S. Pater**
Contact person: **dr inż S. Pater e-mail: sebapater@chemia.pk.edu.pl**

Remarks: Regular course