Warsaw University of Technology | Doctoral School No. 1

Course offered in the Doctoral School No. 1 – Spring semester of the 2021/2022 academic year

TITLE
Separation Processes in Biotechnology
CONDUCTING UNIT
Doctoral School No. 1
SCIENTIFIC DISCIPLINE
Chemical engineering
IMPLEMENTING UNIT
107000 - Faculty of Chemical and Process Engineering
FULL DESCRIPTION
The lecture Separation Processes in Biotechnology presents and systematizes the knowledge about unit operations carried out in the issues of laboratory and industrial technology of biotechnological processes. Issues such as the general concept of engineering and designing a sequence of separation processes in biotechnology are presented. The lecture covers issues related to the implementation of cell disintegration, movement of solid particles in liquid, filtration of suspensions, sedimentation, as well as centrifuges and centrifugation. Subsequently, chromatographic separation processes, adsorption techniques, extraction, absorption, product crystallization, distillation and rectification of liquid products, and solvent regeneration are introduced and discussed. Membrane techniques such as ultrafiultration, microfiltration and reverse osmosis are also discussed, including the diafiltration process. The theoretical foundations of individual separation methods are supplemented with a reference to practical methods of their implementation in industrial lines. The knowledge of the lecture is useful for graduates undertaking professional work in the chemical industry, the pharmaceutical industry as well as in the production and technology of food.
LITERATURE
Podstawowa. 1. „Zasady Inżynierii Chemicznej” M. Serwiński, WNT, 1976 2. „Podstawy Inżynierii Chemicznej” J. Ciborowski, WNT, 1973

3.
„Podstawy Biotechnologii” B.Kristiansen, PWN, 2019

Pomocnicza

„Chromatografia preparatywna jako proces rozdzielania mieszanin” D. Antos, K. Kaczmarski, WNT

LEARNING OUTCOMES		
Students gain systematic knowledge on product separation processes in biotechnology as well as comparative knowledge of alternative chemical and physical separation methods. In addition, they obtain an expanded view of the available separation technologies, the ability to select the right technology for a given purpose, and a systematic knowledge of processes.		
LANGUAGE OF THE COURSE		**ECTS CREDITS**
English		4
TYPE OF CLASSES	**NUMBER OF HOURS**	**COURSE INSTRUCTOR**
Lecture	30	Piotr Grzybowski, dr inż.