

Course title: Process Control and Industrial Measurements – optional course

Institute/Division: FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY / Department of Chemical and Process Engineering

Erasmus subject code:

Number of contact hours: 30 hours (15h Lecture + 15h exercises)

Course duration: 1 semester (spring)

ETCS credits: 2

Course description: **Lectures and exercises content:** Characteristics of automatic control. Properties and advantages of automatic control in chemical industry. / Dynamics of objects in chemical engineering and technology in the domain of time. Criteria for the stability of objects with lumped-state variables. Time and phase trajectories. / Dynamics of linear objects in the domain of complex numbers. Laplace transform. Transfer function for single objects and complex systems. / Frequency characteristics: Nyquist's, Bode's and Nichols'. Graphical representation of frequency characteristics. / Classification of automatic control systems. Structures of automatic control systems. Types and dynamics of continuous and discrete controllers. Criteria of the quality of automatic control systems. / Methods for the evaluation of stability of closed-loop and open-loop systems.

Literature: [1] Luyben, W. L., *Process modeling, simulation and control for chemical engineers*. McGraw-Hill Higher Education, 1989.

[2] Rowland, J.R., *Linear control systems*, J.Wiley & Sons, 1986.

Assessment method: Final test

Prerequisites: Completed courses: Mathematics, Physics, Chemical Engineering

Primary target group: Students in Chemical Engineering or Chemical Technology

Lecturer: J. Szyman, PhD Eng.

Contact person: J. Szyman, PhD Eng., e-mail: jakub.szyman@pk.edu.pl

Deadline for application: 15th January (spring)

Remarks: The course is regular