

Course title:	Technologies for nutrients recovery form biowaste -contradictions, mistakes and future trends
Institute/Division:	FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY
Erasmus subject code:	
Number of contact hours:	30 hours (15h – seminar, 15 h laboratory)
Course duration:	1 semester (spring)
ETCS credits:	2
Course description:	<p>Lectures content: Characteristic of nutrients industry: main raw materials, products and its applications/ Characteristic of Polish, European and World market/ Economic and environmental problems/ Implementation of circular economy/ Innovations in technology of nutrients compounds: secondary raw materials/ Technological examples of nutrients recovery directly on wastewater treatment plants/ Technology description: DHV Crystalactor, Pearl, NuReSys, PHOSPAQ, ANPHOS, STRUVIA/ Nutrients production from secondary raw materials: sewage sludge, sewage sludge ash, meat-bone meal, chicken manure etc. Technology description: OMF, Krepro, LYSOGEST, GIFHORN, MEPHREC, Budheim, LECHPHOS, ECOPHOS, THERMPHOS, AshDec/ Technologies Comparison and critical review./ Threats connected with using secondary raw materials in technology, economic evaluation of innovations environmental aspects of new technologies.</p> <p>Laboratory content: Phosphorus recovery from sewage sludge ash by acidic extraction technical scale Process (L1) Phosphate fertilizers from sewage sludge ash- extract neutralization (L2) Phosphate fertilizers from sewage sludge ash- products characteristic (L3)</p>
Literature:	<p>[1] Phosphorus Recovery and Recycling 1st ed. 2019 Edition by Hisao Ohtake (Editor), Satoshi Tsuneda (Editor)</p> <p>[2] http://www.phosphorusplatform.eu/</p> <p>[3] S.Brett — Phosphorus removal and recovery technologies, London, 1997, Selper publication</p>
Assessment method:	Average from Final test or students projects (depending on group size), presence on lectures and delivered reports from each performed exercise
Prerequisites:	Basic knowledge on technology and basic experience in the laboratory
Primary target group:	Chemical technology/engineering students
Lecturer:	dr hab. inż. K.Gorazda prof PK
Contact person:	dr hab. inż. K.Gorazda, e-mail: katarzyna.gorazda@pk.edu.pl
Deadline for application:	15th of January
Remarks:	The course runs regularly