

**Course title:** Modern technologies in wastewater and water treatment / selectable / ~~regular course~~

**Number of contact hours:** 45 hours (30h seminar, 15h laboratories)

**ETCS credits:** 3

**Course description:** The Clean Water Act; Introducing the Physical Treatment Methods; Introducing Chemical Treatment. Water Treatment Plant Operations; Wastewater characterization and collection. Conventional and advanced wastewater treatment: mechanical, chemical, biological. Examples of technological processes: SBR, UTC, bardenpho, bidenipho, bidenitro, biobed, biopaq. Industrial wastewater treatment technologies.

Sludge processing: filtration, dewatering, stabilization, sanitation, drying, thermal treatment and further utilization.

Possibilities of nutrients recovery from wastewater and sewage sludge.

Laboratories: technological visits at wastewater treatment plant, analysis of basic parameters in water and sludge

**Education effects** (P6S\_UW P7S\_UW, P7S\_WG):

- **knowledge:** student knows legislation for water and wastewater treatment, are aware of problems with waste and environment pollutions caused by sewage, knows technological operations used in treatments plants; knows Technologies used for its treatment; knows possibilities for minimization of its environmental impact.

- **skills:** student recognizes operations and equipment used in wastewater treatment plants; student can analyze basic parameters in water and wastewater.

- **social:** student understands the reason and benefits of water and wastewater treatment; understand the reason of using innovative technologies; understand the environmental and health threats connected with sewage and sewage sludge ; is able to work independently and in the group both at the laboratories and during preparation of the report

**Literature:** Handbook of Water and Wastewater Treatment Technologies, Nicholas P Cheremisinoff

**Assessment method:** presentation of selected topics, completing the laboratories (presence and delivering of reports from performed exercise)

**Prerequisites:** Basic knowledge in chemistry and technology

**Primary target group:** All specialties students

**Lecturer:** dr inż. K.Gorazda, dr inż. B.Tarko/ mgr inż. H.Kominko

Contact person: dr inż. K.Gorazda e-mail: [gorazda@chemia.pk.edu.pl](mailto:gorazda@chemia.pk.edu.pl)