

Technologies to reduce air, water and soil pollution (Viktor Grilc, Ph.D., Full Prof.)

Subject code: TRWS

Academic year: 2.

Lectures: 50

Seminars: 40

Tutorials: 30

ECTS: 11

Aims of the course:

The students will be acquainted with the most important sources of pollution (point and non-point sources) of the air, water and soil, and with protection for a normal development of all living organisms (plants, animals, humans) against pollution. A further goal and purpose of the study subject is to learn about some fundamental technologies for reduction or elimination of consequences arising from pollution. The student will acquire a systematic overview of the types of pollution in the environment and some basic engineering technical measures for protection against pollution.

Subject content:

The study subject comprises air pollution (acid rain, smog, the greenhouse effect, particulate matter, ozone depletion - the ozone hole, global pollutants), characteristics, sources and effects of water contaminants (heavy metals, nutrients (nitrogen and phosphorus compounds), detergents, hydrocarbons and oils, trihalomethane precursors, other harmful pollutants), point and diffuse sources of pollution - pollution arising from settlements, industrial pollution and pollution coming from agriculture, legislation applied in the fields of air, water and soil pollution, strategies to reduce pollution (liquid discharges, reduction of pollution in agriculture), soil pollution, cases of control strategies over environmental pollution in Slovenia (survey of emission sources, quality of the environment, identification of the degree of pollution, a current effect of pollution, possible strategies of control over air, water and soil pollution), lab and semi-industrial tests of waste water treatment, air purification and soil cleanup, and basic dimensioning of treatment plants to reduce pollution.

Teaching methods:

Lectures, seminar work, active teaching, cooperative learning, lab work, field work, discussions

Study obligations

completed tutorials, seminar paper (production, defence) and written exam.

Literature

1. Burton, F.L., Tchobanoglous, G., Stensel, H.D.: *Wastewater Engineering: Treatment and Reuse*, Metcalf & Eddy, McGraw-Hill Higher Education, New York, 2003.
2. Environmental Topics, Vol. 3; *Water and Environment*, J. Rose ed., Harwood Academic Publishers, Langhorne, 1991.

3. Henze, M., Harremoës, P., Jensen, J.C., Arvin, E.: *Wastewater Treatment, Biological and Chemical Processes*, Springer, London, 2002.
4. *Okolje v Sloveniji 2002*, Agencija za okolje, Ljubljana, 2003.
5. Pierzynski, G.M., Sims, T.J., Vance, G.F.: *Soil and Environmental Quality*, CRC Press, London, 2005.
6. Roš, M.: *Biološko čiščenje odpadne vode (Biological Waste Water Treatment)*, GV Založba, Ljubljana, 2001.
7. Roš, M., Simonič, M., Šostar-Turk, S.: *Priprava in čiščenje vod (Waste Water Treatment)*. Maribor: Fakulteta za strojništvo, Oddelek za tekstilstvo (Faculty of Engineering, Textile Department), 2005.