UNIVERSITY OF PANNONIA

COURSE DATASHEET

Semester: 2016/17/1

Course: Water treatment

Code: NKMKFTT112V

Responsible department:

Department code: MKNK

Responsible instructor: Dr. Rita Szakácsné Földényi

Course objectives:

Lectures present a systematic overview of the physical and chemical bases of the water treatment processes. Discussion is focused on the problems related to the technological implementation and cost effective operation of the treatment technologies.

Course content:

1. Water classification according to the source and the intended usage
2. Typical composition of the raw water and the origin of its contaminants in the different water sources
3. Physical and chemical methods applied for the removal of the undesirable components being present in raw water:
water softening (pre- and post-softening, mixed bed polishing); iron, manganese (oxidation) and other heavy metal contaminants (ion exchange); arsenic (oxidation followed by precipitation/coagulation, ion exchange, special adsorption methods, membrane filtration, electrodialysis); boron (ion exchange); ammonium (break point chlorination); nitrate (ion exchange); humic substances, organic micropollutants (oxidation, adsorption); total desalination by ion exchange.
4. Implementation of the discussed methods in the water treatment technologies: overview of complex technological processes depending on the origin, quality and application of raw water
5. Development and elimination of the secondary contaminants of the drinking water
6. Wastes of water treatment (solid, liquid and gas)

Requirements, evaluation and grading:

After a half an hour's preparation the examinee gives an oral presentation on the topic for about 20-25 minutes.
Fail (1) when the examinee is unable to prove either the definition of the basic notions or the short scheme of things connected with the topic.
Pass (2) when the examinee is able to interpret the basic notions of the topic.
Satisfactory (3) when the examinee is well - versed in the basic notions of the topic and is able to present their logic connections - with the help of the examiner.
Good (4) when the examinee provides a logic, well - structured presentation with all the important facts and connections but he does not know or partly knows the required reading material connected with the topic.
Very good (5) when the examinee gives a logic, excellent, well-structured, perfect in details oral presentation that completely reveals the connection of the concepts within the topic.

Required and recommended readings:

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Required and recommended readings:

Öllős Géza: Víztisztítás - üzemeltetés, Egri Nyomda Kft., 1998.
Davis, M.L., Cornwell, D.A.: Introduction to Environmental Engineering 3rd ed., McGraw-Hill, Boston, 1998.
Barótfi István (szerk.): Környezettechnika, Mezőgazda Kiadó, Budapest, 2000.
Jones, H., Visoottiviseth, P., Bux, K. Md., Földényi, R., Kováts, N., Borbély, G., Galbács, Z.: Case Reports: Arsenic Pollution in Thailand, Bangladesh, and Hungary, p. In: Garelick, H., Jones, H. (Eds.), Arsenic Pollution and Remediation: An International Perspective, Rev. Environ. Contam. Toxicol. 197, 163-187. (2008)