Drinking water treatment technologies and health aspects of water supply - BMEEOVKDT84

I. Subject Specification

1. Basic Data

1.1 Title

Drinking water treatment technologies and health aspects of water supply

1.2 Code

BMEEOVKDT84

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Laky Dóra
academic rank	Associate professor
email	laky.dora@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKDT84
https://edu.epito.bme.hu/course/view.php?id=2578

1.10 Language of instruction

english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

2 February 2022

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to introduce the complex processes taking place during drinking water treatment technologies with special focus on the treatment of deep well waters: removal of dissolved gases, iron, manganese, arsenic, ammonium ion and the by-product formation during treatment. The course deals with the adverse health effects of certain water quality compounds and the possibilities to minimize their concentration in the water. The course also gives an overview about the water quality changes in the distribution system.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Knows the most typical pollutants in different water bases and knows the adverse effects of them
2. Understands the main aspects of drinking water treatment processes with special focus on the treatment of deep well waters
3. Knows the adverse health effects of certain water quality compounds and the possibilities to minimize their concentration in the water
4. Knows the secondary water quality deterioration processes in the drinking water supply network and their effects

B. Skills

1. Is able to prepare treatment technological scheme(s) for raw water, which contains dissolved gases, iron, manganese, ammonium ion and arsenic
2. Is able to solve drinking water quality problems in a case study area, where the water originates from deep well waters
3. Is able to make preliminary estimation about the needed chemical dosages and size of the filters for a given raw water quality and flow rate

C. Attitudes

1. Collaborates with the instructor and groupmates
2. He/she constantly expands his/her knowledge, and in addition to the compulsory curriculum, he/she searches answers from web resources as well
3. Strives for comprehensible, precise wording in oral communication

D. Autonomy and Responsibility

1. Use of systematic approach in problem solving
2. Cooperation with fellow students in teamwork

2.3 Methods

Lectures with theoretical knowledge; written and oral communication. Use of IT tools and techniques. Solving drinking water quality problems in a case study area together or in group work.

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Introduction I. – drinking water sources and possible pollutants
2.	Introduction II. – drinking water sources and possible pollutants
3.	Removal of iron and manganese from drinking water
4.	Removal of dissolved gases from drinking water
5.	Removal of arsenic from drinking water
6.	Removal of ammonium ion from drinking water
7.	Complex technological schemes for drinking water treatment
8.	Calculations – examples for the estimation of chemical dosages and size of the rapid filter in a drinking water treatment process
9.	Drinking water quality changes in the water supply network
10.	Health effects of certain water quality parameters, the approach of water safety planning
11.	Case study area - evaluation of drinking water quality problems, possible solutions (case study No.1)
12.	Case study area - evaluation of drinking water quality problems, possible solutions (case study No.2)
13.	Case study area - evaluation of drinking water quality problems, possible solutions (case study No.3)
14.	Case study area - evaluation of drinking water quality problems, possible solutions (case study No.4)

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

1. Water Treatment Plant Design (American Water Works Association)
2. Slides of the lectures

2.6 Other information

Attendance at lectures is mandatory. Minimal required attendance rate is 70%.

2.7 Consultation

The instructor is available for consultation during her office hours, as advertised on the department website. Special appointments can be requested via e-mail from the lecturer: (laky.dora@emk.bme.hu)

This Subject Datasheet is valid for:

Inactive courses

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The learning outcomes defined in point 2.2 are assessed based on the oral exam.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Exam (oral exam)	E	A.1-A.4; B.1-B.3; C.1-C.3; D.1-D.2

The dates of deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

Abbreviation	Score
E	100%
Sum	**100%**

3.4 Requirements and validity of signature

The students have to attend at least 70% of the lectures in order to get the possibility to take the exam. The students have to get at least Passed (2) grade at the exam.

3.5 Grading system

Based on the performance at the oral exam.

3.6 Retake and repeat

If the exam is not successfull, it can be repeated.

3.7 Estimated workload

Activity	Hours/semester
Contact hours	14×2=28
Preparation for the exam	62
Sum	**90**

3.8 Effective date

2 February 2022

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