Water quality in drinking water networks - BMEEOVKDT81

I. Subject Specification

1. Basic Data

1.1 Title

Water quality in drinking water networks

1.2 Code

BMEEOVKDT81

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	28

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Fülöp Roland
academic rank	Associate professor
email	fulop.roland@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKDT81
https://fiek2.mywire.org/course/view.php?id=2581

1.10 Language of instruction

english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

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2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to introduce the students to the possibilities of preserving and improving the water quality in drinking water networks. Topics to be discussed: overview of the causes of water quality deterioration in water distribution systems; condition assessment methodology; basic data of system analyses; preparation of load forecasts; monitoring water quality changes in the water network; application of special water quality control measures and treatment technologies affecting water quality.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. understands the theoretical background of hydraulic modeling of water supply networks,
2. knows the typical pollutants of drinking water distribution systems,
3. knows the removal options for contaminants,
4. is aware of the technical and legal background of water supply systems,
5. understands the effects of long-term planning on water quality,
6. is familiar with modern reconstruction and water treatment technologies,
7. is familiar with water quality problems during operation,

B. Skills

1. is able to identify the drinking water quality characteristics,
2. is able to identify water quality problems during planning and operation of drinking water distribution systems,
3. complex management of various technical problems related to water supply,
4. selects the optimal intervention in the water supply system,
5. is able to present the optimal intervention to decision makers,
6. identifies design problems related to drinking network water quality during construction and afterwards,
7. is able to express his thoughts in an orderly form orally and in writing.

C. Attitudes

1. cooperates with the teacher and fellow students when expanding the knowledge,
2. open to the use of information technology tools,
3. strives to know and routinely use the system of tools needed to solve drainage problems,
4. strives for an accurate and error-free solution,
5. strives for economic efficiency

D. Autonomy and Responsibility

1. independently considers and solves the tasks and problems related to water supply on the basis of specific resources,
2. openly welcomes substantiated critical remarks,
3. in some situations - as part of a team - cooperates with his / her fellow students in solving the tasks,
4. takes a systematic approach to its thinking.

2.3 Methods

Lectures with theoretical knowledge; written and oral communication. Use of IT tools and techniques. Solving case study tasks together, literature research, processing

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Water quality problems in drinking water network systems
2.	Water quality deterioration in drinking water network systems
3.	Relation between the drinking water treatment and the drinking water quality in the distribution system
4.	Risk reduction methods I.
5.	Risk reduction methods II.
6.	Case studies
7.	Simulation modelling of water distribution systems: basics of hydraulic and water quality modelling, theory and practice (EPANET)
8.	Topics identified during individual consultations
9.	Simulation modelling of water distribution systems: elements of the model
10.	Simulation modelling of water distribution systems: consumption model creation
11.	Simulation modelling of water distribution systems: evaluation of hydraulic simulation results.
12.	Simulation modelling of water distribution systems: evaluation of water quality simulation results.
13.	Case studies I.
14.	Case studies II.

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

- EPANET user manual
- slides of the lectures

2.6 Other information

Attendance at the lectures is mandatory. Missing out more than 30% of the lectures means failing the subject.

2.7 Consultation

Consultations: at the beginning of the semester at the consultation time announced on the department's website or contact the lecturers via e-mail: (Roland Fülöp: fulop.roland@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 exam during exam period.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Written and oral exam (summary performance measurement)	Exam (E)	A.1-A.7; B.1-B.7; C.1-C.5; D.1-D.4

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
Exam (E)	100%
Sum	**100%**

3.4 Requirements and validity of signature

The criterion for completion of the subject is to get at least Passed (2) grade at the exam.

3.5 Grading system

Grade	Points (P)
Excellent (5)	80<=P
Good (4)	70<=P<80%
Satisfactory (3)	60<=P<70%
Passed (2)	50<=P<60%
Fail (1)	P<50%

3.6 Retake and repeat

it is possible to repeat the exam if the first attempt is not succesfull / in order to achieve better grade.

3.7 Estimated workload

Activity	Hours/semester
contact hours	2×14=28
preparation for the courses	32
preparation for the exam	30
Sum	**90**

3.8 Effective date

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