I. Subject Specification

1. Basic Data

1.1 Title

Water quality management planning

1.2 Code

BMEEOVKMV62

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	1
Seminar	1

1.5 Evaluation

Midterm grade

1.6 Credits

2

1.7 Coordinator

name	Dr. Clement Adrienne
academic rank	Associate professor
email	clement.adrienne@emk.bme.hu

1.8 Department

Department of Sanitary and Environmental Engineering

1.9 Website

https://epito.bme.hu/BMEEOVKMV62
https://fiek2.mywire.org/course/view.php?id=3524

1.10 Language of instruction

english

1.11 Curriculum requirements

Recommended elective in the Specialization in Water and Hydro-Environmental Engineering (MSc) programme

1.12 Prerequisites

1.13 Effective date

2 February 2022

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2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to provide knowledge for developing water quality management strategies for river basins. Students have to elaborate practical planning exercises to get information about the main steps of river basin management plans according to the EU Water Framework Directive: status assessment, exploration of pollutant sources, evaluation of the impact of point emissions on water quality, estimation of diffuse loads, determination of load capacity and measures to ensure the achievement of the target goal. Knowledge of water quality data evaluation, GIS tools and application of basic water quality models.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Will know the anthropogenic pressures on the aquatic environment and their consequences.
2. Will get an overview of the conceptual framework of the Water Framework Directive (WFD) and the water quality management aspects of river basin management planning.
3. Will know the concept of load capacity and the method of immission load-based regulation.
4. Will be informed about the regulations for point sources (wastewater discharges).
5. Will be aware of the basics of water quality modelling (describing changes in oxygen household and plant nutrients in rivers and lake waters).
6. Will be aware of the tools/approaches for non-point load calculation on catchment level.

B. Skills

1. Will be able to prepare water quality impact analysis and to develop a water quality control strategy at the catchment scale.
2. Will be able to apply water quality models, to build up simpler models on your own.
3. At the application level, will be able to use GIS, software, to perform thematic maps.
4. Will be able to gather information needed to explore water quality problems, navigate international databases and information systems.
5. Will be able to develop a solution for a specific problem.
6. Will be able to prepare the technical documentation and present results in writing and in the form of an oral presentation.
7. Will be able to apply an engineering approach and mindset.

C. Attitudes

1. Will collaborate with the instructor and fellow students in expanding the knowledge.
2. Will broaden knowledge also by gathering information from various sources, including extracurricular sources (i.e. the Internet) as well.

3. Open to the use of information technology tools,
4. Strives for accurate and flawless problem-solving

D. Autonomy and Responsibility

1. Will independently evaluate data, analyze and think through problems and solves them based on specific resources.
2. Openly welcomes substantiated critical remarks.
3. Will take a systematic approach to his thinking.

2.3 Methods

Lectures (oral presentations) and exercises

2.4 Course outline

Hét	Előadások és gyakorlatok témaköre
1.	Water quality control: general introduction, loads and impacts on the catchment.
2.	The objective of the Water Framework Directive and the basics of river basin management planning, the principles of the DPSIR method.
3.	Load capacity based control of pollutant emissions. Emission and mission load-based regulation.
4.	Excercise - determination of load capacity.
5.	Introduction to GIS. Management of databases, display and application of queries (water network, point sources and monitoring stations).
6.	Excercise - water quality impact of wastewater introduction using a simple degradation model. Indirect estimation of diffuse load on a material balance basis.
7.	Basich of water quality modelling, oxygen household in rivers, Streeter-Phelps model and its extensions.
8.	Excercise - determination of dissolved oxygen concentration and critical location in the river section below the sewage inlet.
9.	Determination of wastewater discharge limit values as a function of the water quality target status.
10.	Diffuse pollution models, MONERIS.
11.	Application of GIS databases to determine the characteristics of river basin districts, processing of thematic maps (land use, slope, soil characteristics).
12.	Water quality reservoirs and wetlands. Eutrophication models.
13.	Exercise - Phosphorus retention design.
14.	Presentations

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

Lecture slides
Online materials

2.6 Other information

2.7 Consultation

The instructors are available for consultation during their office hours, special appointments can be requested via e-mail from the lecturers: clement.adrienne@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 assessment of the learning outcomes set out in point 2.2 is based on the preparation of homework consisting of small exercises, as well as active participation in the lessons (partial performance assessment).

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
Excercise 1-4	HW	A.1-A.6; B.1-B.7; C.1-C.4; D.1-D.3

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

3.3 Evaluation system

Jele	Részarány
HW	100
Összesen	**100%**

3.4 Requirements and validity of signature

3.5 Grading system

Érdemjegy	Pontszám (P)
jeles (5)	>=80
jó (4)	70 - 79
közepes (3)	60 - 69
elégséges (2)	50 -59
elégtelen (1)	< 50

3.6 Retake and repeat

The homework - in addition to paying the fee specified in the regulations - can be submitted late until 16:00 on the last day of the replacement period or sent electronically until 23:59. The submitted and accepted homework can be corrected free of charge by the deadline.

3.7 Estimated workload

Tevékenység	Óra/félév
Contact lectures	28
Preparation of the homework	12
Összesen	**40**

3.8 Effective date

2 February 2022

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