Limnology - BMEEOVVDT84

I. Subject Specification

1. Basic Data

1.1 Title

Limnology

1.2 Code

BMEEOVVDT84

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. János Józsa
academic rank	Professor
email	jozsa.janos@emk.bme.hu

1.8 Department

Department of Hydraulic and Water Resources Engineering

1.9 Website

https://epito.bme.hu/BMEEOVVDT84
https://fiek2.mywire.org/course/view.php?id=2501

1.10 Language of instruction

english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

The course offers an introduction to lake limnology, focussing on the governing physical processes in shallow lakes, but also covering water quality, ecology and aspects of lake management. General topics:

- micrometeorology: wind and surface shear
- hydrodynamics: wind-induced water motions: surface setup, currents, surface waves
- thermodynamics: energy budget, stratification, heat fluxes
- sediment dynamics: bed shear, sediment transport
- hydrology: water balance
- water quality and ecology

The topics will be mostly theoretical, illustrated with research results and applications at Hungarian lakes. The course intends to be useful to modellers of water systems.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. You will understand the physical processes governing water quality and ecology of shallow lakes.

B. Skills

1.

C. Attitudes

1.

D. Autonomy and Responsibility

1.

2.3 Methods

Weekly lectures.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Introduction
2.	Wind and wind stress over lake surfaces
3.	WInd induced surface motions (storm surge and seiche)
4.	WInd-induced lake currents
5.	Wind waves
6.	Mass transport
7.	Sediment dynamics
8.	Heat budget, fluxes
9.	Temperature dynamics in water
10.	Water budget
11.	Water quality, eutrophication
12.	(Case study)
13.	(Case study)
14.	Summary

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. Imboden, D.M. (2004): Motion of lake waters. In: O'Sullivan, P., & Reynolds, C. (Eds) The Lakes Handbook, Volume 1: Limnology and Limnetic Ecology. Limnology, 5, 115-152.
2. Jozsa J. (2006): Shallow lake hydrodynamics - Theory, measurement and numerical model applications, A Hungarian-Finnish experience. Lecture notes.
3. Shanahan, P., Harleman, D. R. F., & Somlyódy, L. (1986). Wind-induced water motion. In*Modeling and managing shallow lake eutrophication* (pp. 204-255). Springer, Berlin, Heidelberg.
4. Lecture slides

2.6 Other information

2.7 Consultation

During the weekly consultation hours of the lecturers.

This Subject Datasheet is valid for:

Inactive courses

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

Evaluation of the participant's learning progress described in 2.2. is performed by an exam.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Exam	E	A.1

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

3.5 Grading system

Grade	Points (P)
excellent (5)	85<=P
good (4)	70<=P<85
satisfactory (3)	55<=P<70
passed (2)	40<=P<55
failed (1)	P<40

3.6 Retake and repeat

3.7 Estimated workload

Activity	Hours/semester
participation in contact classes	14×2=28
preparation for the final test	62
Sum	**90**

3.8 Effective date

1 September 2022

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Inactive courses