|  |  |
| --- | --- |
| **Title and code** of the subject: **Hydrobiology, MTMKG7027A**  | **ECTS Credit Points: 3** |
| **Type** of the subject: optional |
| **Ratio of theory and practice:** (credit%) 0/100 |
| **Type and number of classes per semester**: 0 hour(s) lecture and 42 hour(s) practice per **semester** Number of teaching hours / week : 0+3 (lecture and practice) |
| **Type of exam**: exam  |
| **Subject in the curriculum:** semester 1 |
| Preliminary requirements:- |

|  |
| --- |
| **Summary of content - theory**:  |
| **Increased knowledge, skills and competencies** of students will be reflected in the following areas:1. Mastering of the practical implementation of the qualitative and quantitative hydrobiological analysis associated with handling microscopic techniques2. Familiarization with sampling methods of different types of waters, sediments, benthic macroinvertebrates, phytoplankton and zooplankton.3. Understanding of ecological and bioindication indexes calculation and its importance for the estimation of surface water quality and pollution.**Students will be able to:**1. Clearly articulate the methods and key approaches used to the assessment of the status and change in freshwater biological systems.2. Describe the advantages, disadvantages and sources of uncertainty of these ecological and methodological approaches and methods.3. Demonstrate well-developed conceptual knowledge in freshwater biology and ecology;4. Collect new data and synthesis existing information to assess the status of a freshwater system.5. Critically evaluate the strengths and weaknesses of the acquired environmental, ecological data and information;6. Accurately communicate the findings of a freshwater biological or ecological study in a scientific report;7. Demonstrate ability to critically assess the quality of your own work and the work of others8. Develop a global awareness of freshwater issues and the significance of cultural diversity as it pertains to sustainability of water resources. |
| **Summary of content - practice**: |
| Lessons:1. Freshwater ecosystems. General limnology
2. Physical-Chemical characteristics of Freshwater.
3. WQ General
4. The microscope. The anatomy of the plant and animal cell
5. Phytoplankton
6. Zooplankton
7. Macroinvertebrate
8. The Functional feeding groups. Freshwater Macroinvertebrates Protocol
9. The Nekton &Fish sampling
10. Biological Water Qualification. The bio assessment protocols of the wadeable rivers
11. Determination of BISEL index
12. Water qualification according to the Hungarian method.
13. Bacterioplankton & Virioplankton
14. Eutrophication
 |
| **Literature, handbooks in English**  |
| 1. Horne, A.J. and C.R. Goldman. (1994): Limnology. 2nd edition. McGraw-Hill Co., New York, USA.
2. Edmondson, W. T. (1959): Freshwater Biology. John Wiley & Sons, Inc. ISBN 471 23298 X
3. Welch, P. S. (1952): Limnology. McGraw-Hill Book Company, Inc.
4. Wetzel R. (2001): Limnology. Lake and River Ecosystems. 3rd Edition. Academic Press. Hardcover ISBN: 9780127447605, eBook ISBN: 9780080574394.
 |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* The student has the high level of hydrobiological and hydroecological knowledge needed to cultivate the agricultural water management field.
* The student is familiar with hydrobiological and engineering applications related to environmental technology, biotechnology and water management.
* The student is familiar with the latest ecological and biological water qualification procedures.
1. **Skills:**
* The student is able to effectively apply and further develop environmental and engineering techniques in the field of water quality and water treatment.
* The student is able to independently interpret and apply standards and legislation related to water management and environmental activities.
1. **Attitude:**
* The student is committed to environmental protection and sustainable agriculture.
* Make the student's opinion on a professional basis, consistently represent them.
* The student cooperates with experts from other disciplines, accepts different opinions if they are appropriately supported by the professional.
* Lifelong learning
1. **Autonomy and responsibility:**
* With his practical experience, the student decides independently which biological water treatment, wetland management, water supply, engineering and environmental technology work processes should be implemented.
* The student makes decisions with professional responsibility, takes the consequences.
* The student represents, adheres to and complies with the environmental and engineering ethics rules of his / her field
 |

|  |
| --- |
| **Responsible lecturer: Dr Csaba Pregun** |

|  |
| --- |
| **Terms of course completion:** |
| 1. Completing practical exercises
 |
| **Form of examination:** |
| written and/or verbal  |
| **Requirement(s) to get signature:** |
| Participation in lectures and practical exercises. Successful completion of practical tasks. |

|  |
| --- |
| **Exam questions:** |
| 1. Describe the subject of hydrobiology and its relationship with sciences.
2. Describe the main physical characteristics of water!
3. Describe the main chemical characteristics of water!
4. Characterization of pleuston and nekton.
5. Zoning and characteristic vegetation of the coastal region.
6. Stream water habitats and associations
7. Vertical layering of lakes (by light and temperature)
8. The light conditions of the waters
9. The sediment materials according to their origin.
10. General characterization of plankton.
11. Characterization and significance of bacterioplankton.
12. The importance and ecological role of phytoplankton (algae).
13. The plankton paradox.
14. A summary of blue algae (Cyanobacteria) and whipped-algae (Euglenophyta).
15. Summary of Diatoms and Dinophyta.
16. A summary of the green algae.
17. Description of macrophytes.
18. Macrophytes adapt to the aquatic lifestyle.
19. Characterization of animal monocytes (zooplankton I)
20. Characterization and reproduction of Rotatoria (zooplankton II)
21. Characterization of Cladocera and Copepods (Zooplankton III)
22. The general characterization of aquatic invertebrates
23. Characterization of aquatic invertebrates (mayflies).
24. Characterization of aquatic invertebrates (dragonflies).
25. Characterization of aquatic invertebrates (stoneflies)
26. The Functional Feeding Groups.
27. General characterization of the body structure of fish.Fish lifestyle and ecology.
28. Describe the methods of water qualifications.
29. Describe the processes of eutrophication.
30. Characterise the Constructed wetlands.
 |