Course Specifications
Valid as from the academic year 2017-2018

Water Quality Management (I001848)

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Valid as from the academic year 2017-2018

Goethals, Peter
LA22 lecturer-in-charge

Course offerings and teaching methods in academic year 2018-2019
A (semester 2) English

group work 7.5 h
fieldwork 5.0 h
lecture 17.5 h
practicum 12.5 h
self-reliant study activities 2.5 h

Lecturers in academic year 2018-2019
Goethals, Peter

Offered in the following programmes in 2018-2019
Bachelor of Science in Bioscience Engineering (main subject Land and Forest Management) 4 A
Master of Science in Bioscience Engineering: Forest and Nature Management 4 A
Master of Science in Bioscience Engineering: Environmental Technology 4 A
Exchange Programme in Bioscience Engineering: Environmental Technology (master's level) 4 A

Teaching languages
English

Keywords
Monitoring, impacts, assessment, sustainable water management, norms, ecological assessment, objectives of management, measurements of management

Position of the course
This course provides basic and applied information and know how on the components and processes in aquatic ecosystems. Sources and impacts on these systems are presented, as well as monitoring, assessment and management methods.

Contents
1. Problem formulation
   1.1. Functions of water
   1.2. Sustainable use of water
   1.3. DPSIR (Driving forces, Pressure, Effect, Impact and Remediation)
2. Sources and origins of stresses
   2.1. Human activities
   2.2. Sources of emissions
   2.2.1. Human activities
   2.2.2. Agriculture
   2.2.3. Industry
   2.2.4. Traffic and transport
   2.2.5. Recreation and tourism
2.3. Physical stress of the aquatic environment
3. Effects and consequences of impacts
   3.1. Fauna and flora
   3.1.1. Organic pollution
   3.1.2. Eutrophication
   3.1.3. Chemical and toxic pollution

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3.1.4. Thermal pollution
3.1.5. Physical manipulations
3.2. Mankind
4. Monitoring of aquatic ecosystems and impacts
4.1. Definitions of monitoring
4.2. Functions
4.3. Strategies
4.4. Types of monitoring and methods for analysis
4.4.1. Physical-chemical monitoring
4.4.2. Biological monitoring and assessment
4.4.3. Bacteriological monitoring and assessment
5. Water quality management
5.1. Management objectives
5.2. Management measurements
5.3. Measurements of surface waters
5.4 Decision supporting techniques
6. Case study
The students have to work in groups about a certain case study. They have to find out a strategy of monitoring, take physical and chemical measurements and they also have to take some samples in lentic and/or lotic waters. Further they also have to analyse the chemical and biological samples, calculate the indices, assess the results and develop the proper management measures.

Initial competences
Basic knowledge of general ecology and chemistry are sufficient to follow this course.

Final competences
1. know which activities have an impact on the quality of the surface waters
2. know what the effects of human activities are on aquatic systems and have to know how to avoid or how to lower these activities
3. be able to present the different methods of monitoring for the different types of surface waters and their impacts and they also have to be able to present the different instruments and methods for monitoring
4. be able to know the proper measures of management so that the different types of impacts are lowered and they have to place it in the context of the Water Frame Work Directive and Integrated Water Resource Management
5. be able to define sustainable development of water and the different examples and applications
6. be able to carry out a sampling of surface waters and with the results they have to make an interpretation of the water quality

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Group work, lecture, practicum, fieldwork, self-reliant study activities

Extra information on the teaching methods
The course consists of two main parts: theory and practice. The theory entails several lectures, combined with guided exercises and guest lecturers. The practical part entails both field and lab work, during which there will be a focus on the evaluation of water quality based on the chemical and biological conditions. Students have to write a group report about the obtained results. This practical exercise is an obligatory part of this course.

Learning materials and price
slides and notes are provided via Minerva

References

Course content-related study coaching

Evaluation methods
end-of-term evaluation and continuous assessment

(Approved) 2
Examination methods in case of periodic evaluation during the first examination period
  Written examination with open questions

Examination methods in case of periodic evaluation during the second examination period
  Written examination with open questions

Examination methods in case of permanent evaluation
  Assignment, report

Possibilities of retake in case of permanent evaluation
  Examination during the second examination period is possible in modified form

Extra information on the examination methods
  Evaluation is based on period-bound (75 %) and non-period-bound (25 %) evaluation.
  1) Period-bound (75 %): exam
     The exam consists of a combination of (i) short and long theoretical questions and (ii) a series of insight questions. Examples of both are provided throughout the course, allowing students to deal with similar cases. Additionally, a list with example questions is available on Minerva.
  2) Non-period-bound (25 %): report
     The report is based on the field and lab work.
     The examiner can fail students who eschew from the period-bound and non-period bound evaluation.

Calculation of the examination mark
  Period-bound (exam): 75%
  Non-period-bound (report): 25%
  Students who eschew period-bound and/or non-period-bound evaluations for this course unit may be failed by the examiner.

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