Aquatic Microbial Ecology (C002476)

Course Specifications
Valid as from the academic year 2019-2020

Lecturers in academic year 2019-2020
Vyverman, Wim
Lima Mendez, Gipsi
Sabbe, Koen
Verleyen, Elie
Willems, Anne

Offered in the following programmes in 2019-2020
Master of Science in Marine and Lacustrine Science and Management

Course offerings and teaching methods in academic year 2019-2020
A (semester 1) English

Lecture

<table>
<thead>
<tr>
<th>Activity</th>
<th>Contact Hrs</th>
<th>Study Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>30.0 h</td>
<td></td>
</tr>
<tr>
<td>Self-reliant study activities</td>
<td>20.0 h</td>
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</tbody>
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Course size (nominal values; actual values may depend on programme)

- Credits: 6.0
- Study time: 180 h
- Contact hrs: 50.0 h

Teaching languages
English

Keywords
microbial biodiversity and ecology, viruses, prokaryotes, protozoa, micro-algae, marine and lake ecosystems, metagenomics

Position of the course
The aim of this course unit is to provide general insights in the biodiversity and ecology of microorganisms in natural aquatic ecosystems. Special attention will be given to the increasing use of molecular tools, including the latest developments in the ‘omics’ area, to study aquatic microbial diversity and ecology. In addition to lecture sessions, students will have the opportunity to study specific topics in the field of Aquatic Microbiology through one or more literature assignments and practical sessions involving data analysis and interpretation.

Contents
This course unit will cover the microbial biodiversity occurring in natural marine ecosystems with emphasis on eubacteria, archaeabacteria, cyanobacteria, micro-algae and protozoa that play a crucial role in the microbial balance of seas and oceans. Next to general overviews on microbial diversity, natural interactions and importance for ecosystem functioning, a number of lectures will be specifically dedicated to methodological aspects of microbial sampling, isolation, enumeration and identification. The following lectures or lecture series are scheduled in this course unit:

PROKARYOTES
- General introduction to the taxonomic and functional diversity of aquatic prokaryotes
- Sampling, isolation and identification of aquatic prokaryotes
- Molecular diversity and dynamics of bacterial populations in seas and oceans

PROTOZOA AND MICRO-ALGAE
- General overview of the biodiversity of aquatic micro-algae and protozoa
- Sampling, culturing and identification of aquatic micro-algae and protozoa
- Functional diversity of aquatic micro-algae and protozoa
- Biodiversity patterns of aquatic eukaryotic micro-organisms (e.g. seasonality, biogeographical aspects)
- Harmful Algal Blooms (HABs)

(Approved)
GENERAL
• Microbial interactions in marine ecosystems
In addition to the scheduled lectures, students will receive one or more literature assignments. In this way, students have the opportunity to analyze and summarize the experimental design and major findings of published studies in the field of Marine Microbiology, and to present their own views before fellow students by means of an oral Powerpoint presentation.

Initial competences
Basic knowledge of molecular biology, biochemistry and of the physical and chemical ecology of aquatic ecosystems

Final competences
1 Understanding functional microbial diversity in aquatic environments.
2 Understanding and explaining microbial interactions in aquatic ecosystems.
3 Deciding on methodological aspects for isolation and identification of aquatic microorganisms.
4 Summarizing and discussing published literature data.

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
Lecture, self-reliant study activities

Extra information on the teaching methods
Oral lectures, group sessions and individual assignments

Learning materials and price
Powerpoint presentations of each oral lecture will be made available in pdf format via Ufora.

References

Course content-related study coaching
Interactive support via Ufora. Personal contact with lecturers is possible after electronic appointment.

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination

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

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
- Bioinformatics exercises
- Literature assignment
- Written examination with knowledge and interpretive questions

Calculation of the examination mark
• Exercises: 20%
• Literature assignment: 20%
• Written examination: 60%