

Module Specification

Module Title Module Code
Credit Value Level Mode of Delivery Semester B

Pre-requisite modules	Co-requisite modules	Overlapping modules
<input type="text"/>	<input type="text"/>	<input type="text"/>

1) Content Description

Provide a description of the module, as it will appear in the Module Directory and on the Student Information System (approx. 70-80 words).

The module will consist of lectures, group discussions, a one-day fieldtrip, and lab practical sessions. Collectively these will cover aspects of microbial diversity, abundance, and function in a variety of both natural and man-made environments, with some emphasis on aquatic systems. The students will also learn about the microbial interactions and how this affects ecosystem services. The work will be both theoretical and practical, with emphasis on current research questions and methodologies in the primary literature. The content will cover methodological challenges, novel advances in the field, and environmental problem-solving

2) Module Aims

Specify the aims of the module, i.e. the broad educational purposes for offering this module.

The aim of this module is to introduce the students to the microorganisms that are ecologically significant, to develop an appreciation for the Earth system processes that depend on microbes and their interactions. Particular attention will be paid to the ever-developing molecular tools used to evaluate microbial diversity and function, applications of microbial ecology, and the intersection between microbiology and ecology. Practical skills taught will include analyses of biogeochemical and molecular data, bioinformatics, familiarity with sequence database repositories, interpretation of primary literature, and scientific communication.

3) Learning Outcomes

Identify the learning outcomes for this module, i.e. knowledge, skills and attributes to be developed through completion of this module. Outcomes should be referenced to the relevant [QAA benchmark statements](#) and the [Framework for Higher Education Qualifications in England, Wales and Northern Ireland \(2008\)](#). The [SEEC Credit Level Descriptors for Further and Higher Education 2003](#) and [Queen Mary Statement of Graduate Attributes](#) should also be used as a guiding framework for curriculum design.

Academic Content:	
A1	Understand the fundamental principles of microbial ecology and the role of microbes in ecosystem services.
A2	Know how to determine and assess the diversity of microbial communities in different ecosystems.
A3	Understand the techniques used for identifying microorganism.
A4	Appreciate the complexity of microbial communities in ecosystems.
A5	Understand the importance of sequence data collection and repository.
A6	Understand the challenges of these disciplines (e.g. defining microbial species, linking identity and function within diverse microbial communities).

Disciplinary skills - able to:	
B1	Be able to understand the roles of microorganisms and their function.
B2	Be able to critically assess taxonomic identifications and phylogenetic analyses of microorganisms.
B3	Be able to deposit, curate and access taxonomic and functional genomics data.

Attributes:	
C1	Acquire and critically evaluate knowledge.
C2	Connect information from different areas and apply it to solve problems.
C3	Keep up-to-date with changing ideas in science and engage with them.
C4	Familiarise with microbial ecology laboratory techniques.
C5	Analyse scientific data rigorously and present them in different platforms.
C6	Work individually and in groups.

4) Reading List

Provide an indicative reading list for the module. This should include key texts and/or journals but **should not** be an exhaustive list of materials.

Textbooks:
Brock Biology of Microorganisms, 14th Edition, 2014
By Michael Madigan, John Martinko, Kelly Bender, Daniel Buckley, David Stahl
ISBN13: 9781292018348
Microbial Ecology, 1st Edition, 2011
By Larry Barton and Diana Northrup
Wiley-Blackwell, Hoboken, New Jersey
ISBN: 978-0-470-04817-7
Primary Literature
Hug LA, et al. (2016). A new view of the tree of life. Nature Microbiology 1:16048. doi: 10.1038/nmicrobiol.2016.48.
Lindell D, et al. (2005). Photosynthesis genes in marine viruses yield proteins during host infection. Nature 438: 86-89. doi:10.1038/nature04111
Locey JK and Lennon JT. (2016). Scaling laws predict global microbial diversity. PNAS 113: 5970–5975. doi: 10.1073/pnas.1521291113
Strous M, et al. (2006). Deciphering the evolution and metabolism of an anammox bacterium from a community genome. Nature 440: 790-794. doi:10.1038/nature04647

5) Teaching and Learning Profile

Provide details of the method of delivery (lectures, seminars, fieldwork, practical classes, etc.) used to enable the achievement of learning outcomes and an indicative number of hours for each activity to give an overall picture of the workload a student taking the module would be expected to undertake. This information will form the Key Information Set for each undergraduate programme and will be used to populate the KIS widget found on the QMUL programme information pages. More information can be found [online](#) about KIS. You may also wish to refer to the [QAA guidance on contact hours](#) when completing this section.

Activity Type	KIS Category	Time Spent (in hours)
Lecture	Scheduled	22
Practical Classes and workshops	Scheduled	6
Fieldwork	Scheduled	8
	Total	36

Specify the total module notional study hours. This should be a total of the hours given for each activity. The notional study hours for each academic credit point is 10. A 15 credit point module therefore represents 150 notional study hours.

Activity Type	Total Time Spent (in hours)	Percentage of Time Spent
Scheduled learning and teaching	36	24
Placement	0	0
Independent Study	114	76
Total	150	100

Use the information provided in the box above to specify the total time spent and the percentage time spent in

each category of teaching and learning activity.

6) Assessment Profile

Provide details of the assessment methods used to assess the achievement of learning outcomes.

Description of Assessment	Assessment Type	KIS Category	Duration/Length	Percentage Weighting	Final element of assessment	Qualifying Mark
Coursework	Presentation, discussion or essay	Coursework		25	No	N/A
Coursework	Report based on lab practical	Coursework		25	No	N/A
Exam	Written Exam	Written	2.5 h	50	Yes	N/A

Final element of assessment: The assessment that takes place last. **There should normally be only one element of assessment marked as final unless two assessment or submission dates occur on the same day.**

Qualifying mark: A specified minimum mark that must be obtained in one or more elements of assessment in order to pass a module. **This is in addition to, and distinct from, the requirement to achieve a pass in the module mark to pass the module.**

Reassessment

Provide details of the reassessment methods used, specifying whether reassessment is either standard reassessment or synoptic reassessment.

- Standard Reassessment Synoptic Reassessment

Synoptic reassessment details (if you have indicated synoptic reassessment above, please give details)		
Brief Description of Assessment	Assessment Type	Duration/Length of Examination/ Coursework