Module Specification

Environmental Microbiology

Version: 2025-26, v6.0, Approved

Contents

Part 1: Information

Module title: Environmental Microbiology

Module code: USSKN9-15-3

Level: Level 6

For implementation from: 2025-26

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Health, Science & Society

School: CHSS School of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: Microbial Life 2025-26, Microbiology 2024-25, Microbiology 2025-26, The Microbial World 2024-25, The Microbial World 2025-26

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The module environmental microbiology explores the diverse roles that microorganisms play within global ecosystems. This includes investigating the mechanisms by which these microbes contribute to environmental balance, their critical importance in maintaining the health and stability of our planet, and how they can be utilised within anthropogenic activities.

Pre-requisites: Students must have passed either Microbiology USSKB6-15-2 or The Microbial World USSKN7-15-2 before starting this module.

Features: Not applicable

Educational aims: This module builds on the fundamental microbiology content delivered at level 5. The module will provide students with an in-depth understanding of the role that microorganisms play within our global ecosystems, including the study of their diversity, ecology, and impact on natural and engineered systems.

Outline syllabus: The following syllabus topics will be investigated:

Microbial Ecology: students will learn about the diversity of microorganisms that can live in a range of environments, including terrestrial environments, aquatic and extreme environments. This will include an understanding of the environmental selection pressures that give rise to the characteristic microflora found within each environment, including the impact of a changing climate.

Microbial Metabolism: students will understand the molecular mechanisms by which microorganisms can obtain and utilise nutrients within various ecosystems, including photoautotrophs, chemolithotrophs and heterotrophs. This will include an in depth understanding of the various energy generating mechanisms utilised by microorganisms.

Environmental sampling and genomics: students will learn about environmental sampling and isolation techniques, the application of nucleic acid-based analysis for studying microbial diversity in environmental settings, including the role of metagenomics.

Biotechnology: students will learn how microorganisms can be exploited for industrial purposes, including for energy generation (through biofuels, anaerobic digestion and microbial fuel cells), as well as their use within bioremediation and water treatment processes.

Part 3: Teaching and learning methods

Teaching and learning methods: The taught content will be delivered through a series of lectures and tutorials focussed on the core syllabus content of Microbial Ecology; Microbial Metabolism; Environmental Sampling and Genomics; and Biotechnology. In addition, students will undertake practical sessions that build upon this knowledgebase and provide practical skills training in areas relevant to environmental microbiological processes. This will provide direct experience of experimental design, data collection, statistics and data interpretation.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Demonstrate critical evaluation of the role of microorganisms within the environment, including evolutionary selection pressures and microbial interactions within ecosystems.

MO2 Evidence and critically analyse the role of microorganisms in environmental systems through assessment of relevant laboratory data, to enable interpretation of complex data sets in the context of current knowledge.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/usskn9-15-3.html

Part 4: Assessment

Assessment strategy: Assessment: Laboratory Report (3000 words)

Practical laboratory report including critical literature review.

This practical laboratory report and associated critical review of the literature, will be based on practical experimental work undertaken during the course of the module. This will develop key skills in experimental design, data collection and handling, statistics and data interpretation, as well as critical analysis of results to formulate evidenced conclusions. A critical review of the literature will be included within this laboratory report, to ensure students can place this experimental work within context of contemporary scientific knowledge.

Formative support to help students to succeed with this assessment include bespoke tutorials prior to practical sessions and ongoing formative feedback during the practical sessions.

Assessment tasks:

Laboratory Report (First Sit)
Description: Practical laboratory report including critical literature review (3000 words).
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Laboratory Report (Resit)
Description: Practical laboratory report including critical literature review (3000 words).
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Wildlife Ecology and Conservation Science [Zoo] BSc (Hons) 2022-23

Wildlife Ecology and Conservation Science {Foundation} [Zoo] BSc (Hons) 2022-23

Biological Sciences [Frenchay] BSc (Hons) 2023-24

Biological Sciences [Frenchay] MSci 2023-24

Wildlife Ecology and Conservation Science [Frenchay] MSci 2023-24

Environmental Science [Frenchay] MSci 2023-24

Wildlife Ecology and Conservation Science [Zoo] BSc (Hons) 2023-24

Environmental Science [Frenchay] BSc (Hons) 2023-24

Environmental Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2021-22

Environmental Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2021-22

Wildlife Ecology and Conservation Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2021-22

Biological Sciences {Foundation} [Frenchay] BSc (Hons) 2022-23

Biological Sciences [Frenchay] BSc (Hons) 2022-23

Biological Sciences {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2021-22

Biological Sciences {Foundation} [Frenchay] MSci 2022-23

Biological Sciences [Frenchay] MSci 2022-23

Biological Sciences {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2021-22

Wildlife Ecology and Conservation Science {Foundation} [Sep][SW][Zoo][5yrs] BSc (Hons) 2021-22

Wildlife Ecology and Conservation Science [Frenchay] MSci 2022-23

Wildlife Ecology and Conservation Science {Foundation} [Frenchay] MSci 2022-23

Environmental Science {Foundation} [Frenchay] BSc (Hons) 2022-23

Environmental Science [Frenchay] BSc (Hons) 2022-23

Environmental Science {Foundation} [Frenchay] MSci 2022-23

Environmental Science [Frenchay] MSci 2022-23