Module Specification

Ecology and Environmental Systems

Version: 2023-24, v2.0, 21 Jul 2023

Contents

Part 1: Information

Module title: Ecology and Environmental Systems

Module code: USSKAA-30-1

Level: Level 4

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Health & Applied Sciences

Department: HAS Dept of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

Educational aims: See Learning Outcomes

Outline syllabus: Ecosystem structure and function – Definition of ecosystem and components, biotic and abiotic. Trophic levels and energy in ecosystems, comparing productivity. The niche concept and competitive exclusion.

Bio-geochemical cycles – cycling of carbon, nitrogen and water etc. Reservoirs and transformations during cycling. The role of these cycles in maintaining ecosystem structure and function.

Demography and principles of population dynamics – Interspecific and intraspecific interactions in ecosystems. Predation, competition and the effects on carrying capacity and breeding strategies.

Population and evolutionary genetics – gene flow in populations and restrictions to flow that cause isolation and speciation. Hardy-Weinberg principle, genetic drift and mutations. Case studies of habitat fragmentation leading to isolated gene pools, for example, Iberian lynx.

Adaptation of species to changes in environmental conditions – Change over time, mass extinction events and the rise of fish, reptiles or mammals. Adaptive radiation in ancient times and more recent periods, for example, dinosaurs and Galapagos finches.

What is Earth system science and how is it studied? – Division of planetary processes into ‘spheres. Importance in understanding development of the planet and changes in modern times, for example, 21st century global warming.

Atmospheric circulation and transfer of energy and water – Movement of air masses and water around the globe. Latent and sensible heat transfer. Effect on major world biomes and weather patterns.

Hydrological circulation and transfer of energy and nutrients – Ocean currents and the movement of nutrients in the oceans, upwelling and downwelling. Effects on major world biomes and weather patterns.

Regional weather patterns – Comparing weather patterns in the UK to other land masses. Synthesising information from the previous two topics and including topography, surface currents and regional albedo.

Biogeography as the link between Earth system science and ecology – Looking at specific biogeographic realms across the globe, how they developed, processes that maintain them and how they may change in the future due to climate change and species loss.

Climate change – Arguments for and against human activities as a cause of global climate change. Current estimates of likely changes and the result for biodiversity. Students participate in a seminar on this topic, having performed research in specific areas.

The impacts of rocks and soils and on biogeographical regions – Soil formation, fertility and water capacity; effects on plants. Rock formation and denudation as a means of shaping habitats, for example, karst topography, Dartmoor, chalk rivers, calcareous grasslands.

Part 3: Teaching and learning methods

Teaching and learning methods: Scheduled learning:
Students can expect to receive a minimum of 66 hours taught material. This will include surveys of areas of ecological/Earth science significance.

Scheduled learning includes interactive lectures, supervised fieldwork and some basic lab work.

Independent learning:
Students are expected to spend 234 hours on independent learning tasks and preparation of assessments.

Independent learning includes hours engaged with essential reading, assignment preparation and completion.

A variety of teaching and learning approaches will be employed. The module will be

delivered using primarily lectures and practical activities. Lectures will be used to introduce main concepts and to guide and inform student centred learning. These will be further supported by field visits to sites of ecological or Earth science significance which will enable students to apply knowledge and skills taught in the classroom. Student learning will be supported through the University's E-Learning Environment, Blackboard.

The module places considerable emphasis on recognising and using subject-specific theories, paradigms, concepts and principles. The module will introduce the idea of analysing, synthesising and summarising information critically, including prior research. Learning methods include the application of knowledge and understanding to address familiar and unfamiliar problems.

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

MO1 Define the terminology of environmental and ecological systems

MO2 Describe the operation of the dynamic Earth system

MO3 Explain the physical concepts underlying the operation of the Earth system and their impact on biogeographical regions

MO4 Understand the operation and interaction of the hydrosphere, lithosphere and atmosphere

MO5 Be aware of the conflicting paradigms in ecological and evolutionary thinking

MO6 Understand the basic ecological and evolutionary principles which underlie the applications of ecology, particularly with regard to environmental issues

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 234 hours

Face-to-face learning = 66 hours

Total = 300

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/usskaa-30-1.html

Part 4: Assessment

Assessment strategy: Assessment 1 is a Practical Report which requires students to assess lichen flora at a local site and make inferences about the state of the habitat using lichen as bio-indicators.

Assessment 2 is a presentation about future climatic change and its effects on a particular biogeographic region. Students are to consult with the lecturer regarding the actual area to be studied and must explain how changes to climate will influence atmospheric and hydrological processes and thus ecology in that region.

Assessment 3 is an online exam. The papers are designed to test both the breadth of the students' subject knowledge and their understanding of key concepts.

Assessment tasks:

Report (First Sit)
Description: 1500 word report
Weighting: 40 %
Final assessment: No
Group work: No
Learning outcomes tested: MO5, MO6

Presentation (First Sit)
Description: 15 minute presentation
Weighting: 20 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (First Sit)
Description: Online exam (24 hour submission window)
Weighting: 40 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Report (Resit)
Description: 1500 word report
Weighting: 40 %
Final assessment: No
Group work: No
Learning outcomes tested: MO5, MO6

Presentation (Resit)
Description: 15 minute presentation
Weighting: 20 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (Resit)
Description: Online exam (24 hour submission window)
Weighting: 40 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Part 5: Contributes towards

This module contributes towards the following programmes of study: