



## MODULE SPECIFICATION

| Part 1: Information       |                                      |                    |                  |
|---------------------------|--------------------------------------|--------------------|------------------|
| Module Title              | Ecology and Environmental Systems    |                    |                  |
| Module Code               | USSKAA-30-1                          | Level              | Level 4          |
| For implementation from   | 2020-21                              |                    |                  |
| UWE Credit Rating         | 30                                   | ECTS Credit Rating | 15               |
| Faculty                   | Faculty of Health & Applied Sciences | Field              | Applied Sciences |
| Department                | HAS Dept of Applied Sciences         |                    |                  |
| Module type:              | Standard                             |                    |                  |
| Pre-requisites            | None                                 |                    |                  |
| Excluded Combinations     | None                                 |                    |                  |
| Co- requisites            | None                                 |                    |                  |
| Module Entry requirements | None                                 |                    |                  |

| Part 2: Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <p><b>Educational Aims:</b> See Learning Outcomes</p> <p><b>Outline Syllabus:</b> 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.</p> <p>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.</p> <p>Demography and principles of population dynamics – Interspecific and intraspecific interactions in ecosystems. Predation, competition and the effects on carrying capacity and breeding strategies.</p> <p>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.</p> <p>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</p> |

## STUDENT AND ACADEMIC SERVICES

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.

**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.

**Part 3: Assessment**

The Assessment Strategy has been designed to support and enhance the development of both subject-based and employability skills, whilst ensuring that the modules Learning Outcomes are attained, as described below. Assessments are designed to underpin students' learning and skills acquisition in the module and to provide for learning beyond the material delivered in the classroom.

Component A comprises two online exams which take place in January and at the end of the year. The papers are a combination of multiple choice and longer answer questions, designed to test both the breadth of the students' subject knowledge (multiple choice questions), and their understanding of key concepts (longer answer questions). This component will test all learning outcomes.

The Coursework component of the assessment (component B) is made up of two elements:

Element one 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. The report covers learning outcomes 5 and 6.

Element two 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. This presentation covers learning outcomes 1, 2, 3 and 4.

Assessment criteria will be made available to the students in the module guide at the start of the module. All work is marked using the Department's Generic Assessment Criteria, which in turn has been developed with reference to a range of external reference points, including the QAA Quality Code on Assessment of Students and the Recognition of Prior Learning, UWE's Learning, Teaching and Assessment Strategy, and UWE's E-learning policy.

| First Sit Components               | Final Assessment | Element weighting | Description                                    |
|------------------------------------|------------------|-------------------|------------------------------------------------|
| Report - Component B               |                  | 40 %              | 1500 word practical report                     |
| Presentation - Component B         |                  | 20 %              | 15 minute presentation                         |
| Examination (Online) - Component A |                  | 20 %              | Online exam (24 hour submission window)        |
| Examination (Online) - Component A | ✓                | 20 %              | Online exam (24 hour submission window)        |
| Resit Components                   | Final Assessment | Element weighting | Description                                    |
| Report - Component B               |                  | 40 %              | 1500 word practical report using existing data |
| Presentation - Component B         |                  | 20 %              | 15 minute narrated powerpoint presentation     |
| Examination (Online) - Component A | ✓                | 40 %              | Online exam (24 hour submission window)        |

| Part 4: Teaching and Learning Methods                                                                             |                                                                                                                                                          |                                                                          |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Learning Outcomes                                                                                                 | On successful completion of this module students will achieve the following learning outcomes:                                                           |                                                                          |
|                                                                                                                   | <b>Module Learning Outcomes</b>                                                                                                                          | <b>Reference</b>                                                         |
|                                                                                                                   | Define the terminology of environmental and ecological systems                                                                                           | MO1                                                                      |
|                                                                                                                   | Describe the operation of the dynamic Earth system                                                                                                       | MO2                                                                      |
|                                                                                                                   | Explain the physical concepts underlying the operation of the Earth system and their impact on biogeographical regions                                   | MO3                                                                      |
|                                                                                                                   | Understand the operation and interaction of the hydrosphere, lithosphere and atmosphere                                                                  | MO4                                                                      |
|                                                                                                                   | Be aware of the conflicting paradigms in ecological and evolutionary thinking                                                                            | MO5                                                                      |
|                                                                                                                   | Understand the basic ecological and evolutionary principles which underlie the applications of ecology, particularly with regard to environmental issues | MO6                                                                      |
| Contact Hours                                                                                                     | <b>Independent Study Hours:</b>                                                                                                                          |                                                                          |
|                                                                                                                   | Independent study/self-guided study                                                                                                                      | 234                                                                      |
|                                                                                                                   | <b>Total Independent Study Hours:</b>                                                                                                                    | 234                                                                      |
|                                                                                                                   | <b>Scheduled Learning and Teaching Hours:</b>                                                                                                            |                                                                          |
|                                                                                                                   | Face-to-face learning                                                                                                                                    | 66                                                                       |
|                                                                                                                   | <b>Total Scheduled Learning and Teaching Hours:</b>                                                                                                      | 66                                                                       |
|                                                                                                                   | <b>Hours to be allocated</b>                                                                                                                             | 300                                                                      |
|                                                                                                                   | <b>Allocated Hours</b>                                                                                                                                   | 300                                                                      |
|                                                                                                                   | Reading List                                                                                                                                             | The reading list for this module can be accessed via the following link: |
| <a href="https://uwe.rl.talis.com/modules/usskaa-30-1.html">https://uwe.rl.talis.com/modules/usskaa-30-1.html</a> |                                                                                                                                                          |                                                                          |

| Part 5: Contributes Towards                                                                                                                         |
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| <p>This module contributes towards the following programmes of study:</p> <p>Integrated Wildlife Conservation [Sep][FT][Zoo][2yrs] FdSc 2020-21</p> |