Module Specification

Air, Land and Water: Fundamental Processes

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Part 1: Information

Module title: Air, Land and Water: Fundamental Processes

Module code: UBGMB1-30-1

Level: Level 4

For implementation from: 2024-25

UWE credit rating: 30

ECTS credit rating: 15

College: College of Arts, Technology and Environment

School: CATE School of Architecture and Environment

Partner institutions: None

Field: Geography and Environmental Management

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: This is the first module in a series of two linked across Level 4 and Level 5 that are designed to deliver a spine of critical environmental sciences knowledge and skills. This module also links strongly to the GIS for Environmental Management module, by providing further opportunity for the development of GIS and remote sensing skills and knowledge.

Features: Not applicable

Educational aims: The purpose of this module is to provide a sound basis for understanding the characteristics, state, processes and interactions between the three fundamental components of the natural environment (air, land and water). This will integrate across the disciplines of climate science, meteorology, hydrology and earth science and prepare students for more advanced study of the three domains in the following year. In addition, the module will introduce basic analytical tools (e.g. descriptive statistics) and reinforce GIS and remote sensing skills being developed in other Level 4 modules.

Outline syllabus: Planetary drivers - orbits, seasons, solar radiation fluxes, cycles.

Structure and properties of the atmosphere - energy budgets and processes, temperature, gasses and liquids, vapour pressure, relative humidity, greenhouse gasses, ozone.

Meteorological processes – precipitation, evaporation, pressure, winds and weather systems. Local climates and microclimates.

Global energy and moisture dynamics – general circulation, circulation modes, land and sea effects, synoptic climatology, climate types on land.

Hydrological cycle and processes – infiltration, water in the soil zone, recharge, runoff, water quality and quantity.

Climate change – processes, models and projections.

Anthropogenic impacts to air land and water – air pollution, GHG emissions, erosion and land degradation, water pollution (diffuse and point-source), eutrophication, salinisation.

Approaches to air quality management, catchment and water management, landscape rehabilitation and restoration.

Analytical techniques – descriptive statistics and charts, hydrological techniques

(e.g. flow duration curves, flood frequency analysis), mapping and basic spatial analysis using GIS and remote sensing.

Part 3: Teaching and learning methods

Teaching and learning methods: Lectures, supported by reading and enquiry-based tasks will be used to build a theoretical understanding of fundamental processes. This understanding will be reinforced and further developed through weekly practicals which will focus on the application of knowledge to a defined context and through training in the practical application of valuable employability skills. Practical materials are specifically designed to develop independent learning skills and foster learner confidence. Where possible, opportunities for local field data collection and observation will be incorporated into practicals. This module is the first across a longitudinal curriculum of knowledge acquisition, technical skilling and personal development.

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

MO1 Explain factors and processes influencing global and regional climate systems.

MO2 Articulate understanding of the properties and structure of the atmosphere.

MO3 Explain and quantify processes in the hydrological cycle and how they influence water quantity and quality.

MO4 Use GIS, remote sensing and descriptive statistics to examine spatial and temporal characteristics of air, land and water processes.

MO5 Communicate successfully through graphs, maps, visualisations and technical writing (digital and physical).

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 220 hours

Face-to-face learning = 80 hours

Total = 300

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://rl.talis.com/3/uwe/lists/0B8C6892-A7F6-00B5-3BE8-C41D00D292DA.html?lang=en-GB&login=1

Part 4: Assessment

Assessment strategy: Building learner's confidence in application of practical skills is a critical aim of the module because this not only has the obvious skills outcome, but also because 'doing something' helps reinforce theoretical understanding. In this module we keep a tight link between concepts and their utility by providing multiple opportunities to grapple with things in practice, where formative feedback is rapid and available in the context. For example, practical exercises are designed to be stand-alone to encourage independent enquiry, but supported by context-sensitive feedback. Practical exercises and immediate feedback keep the learner on-track and help develop confidence.

The Assessment:

Portfolio - comprises 4 elements which are released sequentially to encourage continuous engagement. Feedback is given on each Portfolio Element before the next is released, so that learners can incorporate learning from this into their next attempt. Early in the module students will focus on developing practical analytical skills that underpin an understanding of environmental processes. A series of 4 Portfolio Elements will be released sequentially. These will be designed to test application of specific skills and the interpretation of relevant data and outputs. These are released sequentially to encourage continuous engagement and build confidence through timely feedback.

Report - Whilst the portfolio is designed to assess learning around individual techniques, skills and understanding of fundamental processes, the Report is much more integrative. Here, learners will be given a problem and will then need to

demonstrate that they can identify the relevant fundamental processes and scope potential issues and impacts. They will need to select relevant techniques to define and characterise the problem and draw on their understanding to suggest potential solutions and management approaches. Students will be required to report verbally on their progress during the semester in a scaffolded project enquiry process, supported by feedforward at each stage. The report will assess their written and visual communication skills and their ability to contextualise and characterise environmental problems, whilst also demonstrating an awareness of potential solutions. The report will need to show the learner can (i) identify and explain the relevant fundamental processes, (ii) scope potential impacts and (iii) identify potential solutions and/or management interventions.
Students will be supported, at a modular and programmatic level, by a series of workshops focussing on technical and academic writing, data visualisation, and science communication.

Resit Portfolio - a similar brief to that described above, which may include some topic changes.
Resit Report - a similar brief to that described above, which may include some topic changes.

Assessment tasks:

Report (First Sit)
Description: Report (3000 words)
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Portfolio (First Sit)
Description: Portfolio (5 pages)
Weighting: 50 %
Final assessment: No
Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Portfolio (Resit)
Description: Portfolio (5 pages)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Report (Resit)
Description: Report (3000 words)
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Environmental Management [Frenchay] BSc (Hons) 2024-25

Environmental Management {Apprenticeship-UWE}[Frenchay] BSc (Hons) 2023-24