



## **Module Specification**

### **Resource Security and Sustainability**

Version: 2023-24, v2.0, 19 Jun 2023

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## Part 1: Information

**Module title:** Resource Security and Sustainability

**Module code:** USSKBE-30-3

**Level:** Level 6

**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

**Delivery locations:** Not in use for Modules

**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:** Brief indication of topics and issues covered in chronological order:

Overview of sustainability and sustainability indicators.

Resource utilization: land, water and air. Mineral resources, recovery and use.

The production and use of plastics; resource implications; disposal and pollution issues.

Population dynamics and the demand for resources. The 'Three Earths' concept of resource demand and usage.

Agriculture and crop production; the demands for feeding a growing world population; the availability and use of water for agricultural land irrigation. The application of GM technology in agricultural production; comparison of European and worldwide application of GM technology; public perception. Sustainable food and feed production.

The use of agricultural land for non-food use; the production of bioplastics; application of agricultural land for biomass and energy/fuel production.

Potable water supply and sewage treatment; the application of novel technologies to meet the needs of a growing worldwide population. Novel integrated systems for wastewater treatment and potable water supply.

Environmental quality standards; national and international standards. Advanced aspects of integrated pollution, prevention and control (IPPC). Novel aspects for pollution monitoring.

Contaminated land and groundwater remediation; the application of physical, chemical and biological processes. Bioremediation (microbially mediated and phytoremediation); the treatment of oil spillages at sea and on land.

The application of biological systems in the enhancement of resource recovery:

Microbial Enhanced Oil Recovery (MEOR), ore-leaching processes for the recovery of copper, uranium and other metals.

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** The delivery of the module will include lectures, tutorials and workshops with the following contact hours:

Scheduled learning (66 hours) includes lectures, tutorials and workshops.

Independent learning (234 hours) includes hours engaged with essential reading, case study preparation, assignment preparation and completion.

A variety of teaching and learning methods will be adopted in the presentation of this module:

Lectures will describe the concept of sustainability and relate this to current and future resource demand taking in to account the current predictions in world population dynamics.

Tutorials will supplement the lectures and give support to students in their case study and modelling coursework.

Workshop sessions will be based around the use of population dynamics and resource utilization modelling.

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

**MO1** Critically discuss sustainable development and sustainability, and how these concepts are implicit to improving environmental quality and managing resources

**MO2** Review the processes for the sustainable production of resources and utilization of feedstocks

**MO3** Evaluate the role of legislation, economic and social considerations in managing pollution and in the sustainable production of resources

**MO4** Apply the use of simulation models for population dynamics and resource utilization

**MO5** Critically review the application of biotechnological processes in the enhancement of the recovery of mineral resources

**MO6** Critically evaluate physical, chemical and biological techniques for the remediation of contaminated land, marine and groundwater supplies

**MO7** Evaluate the use of agricultural land for food and non-food applications

**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](https://uwe.rl.talis.com/modules/usskbe-30-3.html) via the following link <https://uwe.rl.talis.com/modules/usskbe-30-3.html>

## **Part 4: Assessment**

**Assessment strategy:** Assessment 1 is a case study (2500 words).

Assessment 2 is a report, based on the workshops (2500 words).

Assessments 1 and 2 are designed to assess the student's ability to acquire and analyze data on population growth, resource demand and sustainability. These assignments are also designed to assess the student's ability to present such information as written reports.

Assessment 3 is an online examination (with a 24 hour window for completion). The

examination is designed to test the student's understanding of sustainability and the impact that a growing World population has on demand for resources. It will assess the student's ability to critically analyze the options that exist to meet such demands and devise an appropriate strategy for future development.

**Assessment components:****Case Study** (First Sit)

Description: Case study (2500 words)

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4, MO7

**Report** (First Sit)

Description: Report (2500 words)

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4, MO7

**Examination (Online)** (First Sit)

Description: Online examination (24 hours)

Weighting: 60 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO5, MO6, MO7

**Case Study** (Resit)

Description: Case study (2500 words)

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4, MO7

**Report (Resit)**

Description: Report (2500 words)

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4, MO7

**Examination (Online) (Resit)**

Description: Online examination (24 hours)

Weighting: 60 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6, MO7

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Environmental Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Environmental Science [Sep][FT][Frenchay][4yrs] MSci 2021-22

Environmental Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Environmental Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21

Environmental Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2020-21

Environmental Science [Sep][SW][Frenchay][5yrs] MSci 2020-21

Environmental Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Environmental Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2019-20

Integrated Wildlife Conservation {Top-Up} [Frenchay] BSc (Hons) 2023-24