

HR902-10 Soil sustainability and the environment

23/24

Department

Life Sciences

Level

Taught Postgraduate Level

Module leader

Gary Bending

Credit value

10

Module duration

2 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module focuses on providing the students with an understanding of the environmental and safety risks associated with technology together with methods for limiting damage and risk. Reference to practical examples will be used wherever possible.

[Module web page](#)

Module aims

1. Understand the principles of soil science and soil management
2. Understand the fundamental concepts of resource management for agriculture, landscape and conservation
3. Evaluate the use of water, nutrients and other natural resources on agricultural regimes as well as their impacts on the wider environment
4. Analyse the sources and effects of environmental pollution
5. Select and apply appropriate tools and techniques to optimise cropping and limit and manage pollution

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. Soil genesis, structure and classification
2. Assessing soil quality and ecosystem services
3. Soil carbon cycling
4. Soil biota and above-below ground food webs
5. Soil carbon and climate change
6. Management of soil carbon
7. Plant elemental nutrition and acquisition
8. Soil nitrogen and phosphorus cycling and pollution
9. Soil degradation and desertification
10. Soil water and cropping
11. Sustainable soil management
12. Soil pollution
13. Compost and waste application to land
14. Public understanding of soil science

Learning outcomes

By the end of the module, students should be able to:

- Understand the processes and timescales governing soil formation
- Understand the role of soil processes in regulating the global carbon, nitrogen and phosphorus cycles
- Critically evaluate approaches to define, assess and quantify soil quality
- Understand the role of soils in supporting agricultural productivity and the principles of sustainable agricultural soil management
- Have a critical awareness of environmental problems arising from unsustainable soil management practices
- Understand the key chemical and biological pollutants which affect soil and critically evaluate implications for human health
- Understand the principles of composting, approaches to evaluate compost characteristics, and regulations surrounding the application of organic materials to land
- Understand and challenge public perceptions of soils and their role in delivering ecosystem services

Indicative reading list

NC Brady and RR Weil (2017) *The Nature and Properties of Soils*. 15th Edition. Pearson e-book. ISBN 9781292034041

Richard D. Bardgett (2005) *The biology of soil: a community and ecosystem approach*. Oxford University Press.

Subject specific skills

Understand the processes and timescales governing soil formation

Understand the role of soil processes in regulating the global carbon, nitrogen and phosphorus cycles

Critically evaluate approaches to define, assess and quantify soil quality

Understand the role of soils in supporting agricultural productivity and the principles of sustainable agricultural soil management

Have a critical awareness of environmental problems arising from unsustainable soil management practices

Understand the key chemical and biological pollutants which affect soil and critically evaluate implications for human health

Understand the principles of composting, approaches to evaluate compost characteristics, and regulations surrounding the application of organic materials to land

Transferable skills

Understand and challenge public perceptions

Study

Study time

Type	Required
Lectures	14 sessions of 1 hour (14%)
Seminars	1 session of 2 hours (2%)
Practical classes	(0%)
Supervised practical classes	1 session of 2 hours (2%)
Fieldwork	1 session of 3 hours (3%)
Private study	54 hours (54%)
Assessment	25 hours (25%)
Total	100 hours

Private study description

Independent research

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A5

	Weighting	Study time
Data analysis and interpretation exercise	100%	25 hours
Students will be given a data set relating to ecosystem services provided by soil eg carbon storage. They will be asked to 1. identify a number of specific research questions relating to the data. 2. use the data to address these questions, presenting their data analysis in a suitable format and with appropriate statistical analysis. 3. evaluate this evidence in the context of the wider literature 4. identify specific areas for future study including consideration of methods and experimental approaches which could be used		

Feedback on assessment

Written individual feedback to each student on essay and seminar assessments. Face-to-face feedback on any assessment provided on request from the student.

Availability

Courses

This module is Core for:

- Year 1 of THRA-D4A1 Postgraduate Taught Environmental Bioscience in a Changing Climate
- THRA-D4A3 Postgraduate Taught Food Security
 - Year 1 of D4A3 Food Security
 - Year 1 of D4A3 Food Security
- Year 1 of THRA-D4A2 Postgraduate Taught Sustainable Crop Production: Agronomy for the 21st Century

This module is Optional for:

- Year 1 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)