HR903-10 BioScience, Politics & Social Acceptability

26/27

Department
Life Sciences
Level
Taught Postgraduate Level
Module leader
David Chandler
Credit value
10
Module duration
2 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Science and technology have a central place in modern society. Since the end of the second world war, scientific research has led to unparalleled developments in medicine, agriculture, manufacturing, transport, computing, communications, energy production, to name but a few. These changes have driven increases in the standard of living, health and wellbeing of many people. However, at the same time, the expansion of modern, industrialised economies has led to significant pressure being placed on the environment (though climate change, ocean acidification, biodiversity loss, and disruption of biogeochemical cycles). In addition, science and technology are being viewed increasingly as a threat by some sectors of society, particularly where they are considered to impact negatively on the sanctity of life, public health, privacy, democracy and personal freedom. In these cases, controversies arise which lead to public disputes and raises complex ethical questions. There are related issues about how science and technologies can best be regulated and used for common good in a globalised world in which enlightenment values are increasingly being questioned.

Scientists play a critical role in these issues, both in terms of developing new scientific discoveries and technologies in universities, institutes and industry, and also by acting as government policy advisors, regulators, communicators, or working for NGOs and pressure groups. Sometimes,

scientists have conflicting roles as the originators and advocates for new technologies, as well as being the safety and risk assessor for the same technologies. The pressure to publish novel and groundbreaking findings can lead to some scientists publishing work that is incorrect, not repeatable, or interpreted in a particular way to grab headlines. These issues have generated questions about trust in scientists, the reliability of scientific evidence, and its ownership.

Module web page

Module aims

- Understand the relationship between science and the other forces of modernity: industry, commerce, culture and politics.
- Discuss some of the existential, environmental risks that threaten modern society and why we are failing to act on them.
- To explore how different ethical theories can be used to gain new insight into controversial issues that involve science, wider society, and the environment. Examples explored in the course include GM crops, food safety, over-exploitation of natural environmental resources, and climate change.
- To investigate the history, philosophy, and practice of science. We explore why modern science is effective at generating knowledge, and also why it can falter, with problems around fraud, bias, negligence and hype.
- To put different ideas and concepts in the module into practice, through discussion, workshops and summative assessment.

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. Module introduction. The role of science in society and its relationship with the other forces of modernity.
2. The age of risk: could technological threats, environmental meltdown and pandemics lead to the collapse of society? What would a 'good society' look like? How do we achieve it?
3. A brief introduction to key concepts in politics, philosophy & economics and how they shaped the modern world. Explore why modern economic systems place little value on ecosystem services, and discuss the principles of reshaping governance and economic approaches to the environment for sustainability and global justice.
4. An introduction to ethics. Outline of different ethical theories and how to use them to inform decision making for science, medicine and environmental issues. Apply ethical theories in a class workshop.
5. The philosophy and practice of science. What is science and how is it done? What are the hallmarks that make modern science a ‘knowledge machine’?
6. Science, government, and evidence-based policy making. Explain what is meant by evidence-based / evidence-informed policy making. Show how scientific advice and risk assessments are made available to policy makers. Identify advisory bodies and their roles.
7. The history of the modern academic science publishing industry, its use of a ‘triple pay’ system, the development of journal impact factors and the adoption of e-publishing.

Discussion of the positive and negative effects of the publishing industry on modern scientific practice.
8. Fraud, bias, negligence and hype: is there a crisis in modern science? Exploration of how modern science is vulnerable to unreliable, exaggerated or fraudulent claims and publications, why exposing these problems is important, and how to fix them.
9. Global challenges on the environment. Summarise the key features of the planetary environmental emergency. Explore why society is failing to act effectively on climate change. Look at failings in the food system and the different perspectives of ‘wizards’ versus ‘prophets’ for food system change. Bring different concepts from the module together using a case study of the reported effects of neonicotinoid pesticides on bees.

Learning outcomes

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

- Understand basic concepts in politics, philosophy and economics that shape the modern world and impact on our use / exploitation of the natural environment.
- Understand the relationships and interdependencies of the forces of modernity.
- Demonstrate understanding of ethical questions concerning science, technology and the environment by applying different concepts and ideas in moral philosophy.
- Be able to identify the participants involved in specific ethical questions and explain their roles / motivations.
- Be able to explain the challenges faced by governments and other actors involved in developing and regulating science and technology.
- Understand how modern science is done, and the principles needed to ensure that science is practiced in ways that are fair, rigorous, meaningful, and unbiased.
- Understand the barriers to fixing the global environmental emergency and appreciate the need for solutions that encompass industry, commerce, culture, science and politics.

Indicative reading list

Reading lists can be found in Talis

Interdisciplinary

Module gives an introduction to science students about a range of disciplines and ideas that interact with science to create the modern world: ethics (moral philosophy), politics, culture, economics.

Subject specific skills

- Understanding of ethical questions concerning science, technology and the environment.
- Ability to combine normative ethical theories with knowledge of natural science.
- Knowledge of the challenges faced by governments and other actors involved in developing and regulating science and technology.
- Knowledge of the philosophy and practice of modern science.

Transferable skills

- Recognise and explain conflicts of interest between participants.
- Application of ideas of ethics and justice.
- Understanding of how the modern world operates, and the interplay of science, industry, commerce, culture and politics in shaping modernity.

Study

Study time

Type	Required
Lectures	11 sessions of 1 hour (13%)
Seminars	16 sessions of 1 hour (19%)
Practical classes	(0%)
Private study	58 hours (68%)
Total	85 hours

Private study description

Students to prepare in advance for workshops, to synthesize material on ethics, moral philosophy and ethics so that key principles and ideas can be utilized in the assessed essay, and to conduct background reading and literature searches on the essay (which is based on describing and deconstructing an ethical issue of their choice that concerns science and / or the environment and society).

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 A6

	Weighting	Study time	Eligible for self-certification

Assessment component

	Weighting	Study time	Eligible for self-certification
Essay	100%	15 hours	Yes (extension)

Reassessment component is the same

Feedback on assessment

Written feedback on essay.

Availability

Courses

This module is Core for:

- Year 1 of THRA-D4A1 Postgraduate Taught Environmental Bioscience in a Changing Climate
- Year 1 of THRA-D4A3 Postgraduate Taught Food Security

This module is Core optional for:

- Year 2 of THRA-D4A3 Postgraduate Taught Food Security

This module is Optional for:

- Year 1 of TCHA-F1PC Postgraduate Certificate in Transferable Skills in Science
- Year 1 of TCHA-F1PD The Warwick Postgraduate Award in Transferable Skills in Science
- Year 1 of ULFA-C1A2 Undergraduate Biochemistry (MBio)
- Year 1 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)
- Year 1 of ULFA-C1A3 Undergraduate Biomedical Science (MBio)

This module is Option list A for:

- Year 1 of TCHA-F1PD The Warwick Postgraduate Award in Transferable Skills in Science