

# HR923-10 Biological Invasions in Changing Environments

21/22

**Department**

Life Sciences

**Level**

Taught Postgraduate Level

**Module leader**

John Clarkson

**Credit value**

10

**Module duration**

2 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

Non-native invasive species pose significant threats to natural and agricultural ecosystems worldwide and often have very severe, though difficult to quantify, economic impacts. Invasive species rank second only to habitat loss and destruction in a list of global threats to biodiversity. Climate change, environmental degradation, together with increased global trade, promote opportunities for the introduction, spread and persistence of invasive species and hence there may be undesirable interactions between biological invasion and climate change.

[Module web page](#)

### Module aims

This module will introduce students to the principles of invasion biology and ecology with reference to ecological hypotheses. These principles will be illustrated with a number of case studies which will be examined in more detail using examples of invasive plants, pathogens, microbes, insects, mammals and invertebrates in agricultural and natural terrestrial, aquatic and marine environments. These more detailed studies will investigate the economic and environmental impacts of invasive species. Throughout, the current and future impacts of environmental change

on invasive species will be considered.

This module will enable students to evaluate the threats posed by invasive species in agricultural and natural ecosystems that are subject to increased environmental change and disturbance.

## **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.

Principles of invasion ecology – terminology and definitions, mode and source of introduction, detection, invasion process, ecology and evolution of invasive species, ecological impacts and hypotheses Biology, ecology and management of plant invasions – biological characteristics of invasive plants, evolution of invasiveness, control Biology, ecology and management of invasive plant pathogens– detection, biological and genetic characteristics, control Biology, ecology and management of arthropod invasive species – economic, environmental and agricultural damage, control Invasive species in marine environments – ballast water, effects of changing ocean temperature on species distributions, algal blooms

## **Learning outcomes**

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

- Demonstrate an understanding of the biological characteristics of invasive species and the ecological principles that underpin the invasion process.
- Critically evaluate the agricultural, environmental, ecological and economic impacts of invasive species.
- Evaluate detection, avoidance and management strategies for invasive species.
- Demonstrate critical awareness of the potential impacts of climate, environmental change and globalisation on biological invasions.
- Critically evaluate and synthesise peer-reviewed papers on quantitative studies investigating ecological hypotheses tested using invasive species.

## **Subject specific skills**

Evaluate detection, avoidance and management strategies for invasive species

## **Transferable skills**

Critical evaluation and synthesis

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## **Study**

## **Study time**

| <b>Type</b>     | <b>Required</b>             |
|-----------------|-----------------------------|
| Lectures        | 15 sessions of 1 hour (15%) |
| Seminars        | 6 sessions of 1 hour (6%)   |
| External visits | 1 session of 8 hours (8%)   |
| Private study   | 45 hours (45%)              |
| Assessment      | 26 hours (26%)              |
| Total           | 100 hours                   |

### **Private study description**

Research

### **Costs**

No further costs have been identified for this module.

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### **Assessment**

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

#### **Assessment group A4**

|                                 | <b>Weighting</b> | <b>Study time</b> |
|---------------------------------|------------------|-------------------|
| Seminar Presentation            | 50%              | 13 hours          |
| Interceptions Workshop Write-Up | 50%              | 13 hours          |

Summarising and examining data associated with interceptions of invasive species.

### **Feedback on assessment**

Detailed written comments will be provided to the students.

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### **Availability**

#### **Courses**

This module is Core for:

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

This module is Core optional for:

- 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)

This module is Unusual option for:

- Year 1 of TCHA-F1PE Postgraduate Taught Scientific Research and Communication