

Minor Specification

Ecology and Evolution

This specification provides a concise summary of the main features of the minor and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Name of minor	Ecology and Evolution
FHEQ level of final award	As for the Major programme (Level 6)
QAA Subject Benchmark or other external reference	Bioscience
Faculty that owns the minor	FNES
Minor Leader	Dr Alan Marchant
Date specification was written	08-05-2014

Overview of Minor

1 Brief outline of the minor

The Ecology and Evolution minor follows the 'Ecology and Evolution' stream that is part of the BSc Biology and BSc Zoology within CfBS. After a basic module (Ecology and Evolution) in year 1, the student takes one 2nd year module in Ecology and one 2nd year module in Evolution. In year 3, the student takes two modules from a choice of six, allowing a limited level of specialisation.

2 Learning and teaching

Teaching methods on the modules that form part of this minor include classical lectures, lab practicals, computer-based practicals, field practicals, analytical workshops, small-group discussions, and self-assessment quizzes.

3 Assessment

Assessment methods include MCQs, practical write-ups, short-answer exam questions and essay exam questions. Depending on the choices made in year 3, assessment methods can also include poster presentations, position and/or review papers, critical peer review, writing in a popular science style, and podcasts.

Educational Aims of the Minor

Please make sure that each bullet point follows logically from the introductory clause, making a complete sentence]

Introductory statement

The aims of the minor are to:

- Give students a basic understanding of ecology and evolution in year 1
- Build on this basic understanding in year 2 through more in-depth modules focusing on ecology and evolution
- Expose students to current research in the fields of ecology and evolution in year 3
- Allow students to follow their specific interest in year 3 by giving them a choice of two from four modules

Learning Outcomes for the Minor

Knowledge and Understanding

Having successfully completed this minor you will be able to demonstrate knowledge and understanding of:

- Ecological processes and concepts
- Evolutionary processes and concepts, at the phenotypic and molecular level, and at different time scales
- Current research in the field of ecology and evolution

Teaching and Learning Methods

- Classical lectures
- Self-assessment quizzes
- Small-group discussions

Assessment methods

- MCQs
- Short-answer exam questions
- Essay exam questions

Subject Specific Intellectual and Research Skills

Having successfully completed this minor you will be able to:

- Explain how organisms interact with their environment
- Explain the basics of population ecology
- Explain the dynamics of communities and ecosystems
- Explain the relevance of evolution to ecology
- Carry out simple ecological experiments under supervision
- Collect, analyse and interpret data to produce focused scientific reports
- Discuss the contribution that Darwin has made to our understanding of the process of evolution, and explain the terms Darwinism and Neodarwinism
- Explain what causes and maintains genetic and phenotypic variation
- Explain the processes of natural, sexual and kin selection
- Understand the basics of population genetics

- Discuss the various modes of speciation
- Understand the basics of phylogenetics and how phylogenetic trees are reconstructed
- Discuss the molecular basis of evolution
- Explain what horizontal gene transfer is and why it adds a new dimension to Darwinian evolution
- Discuss the role that mass extinctions have played in the history of life on earth
- Explain why living organisms grow exponentially, and the roles of intra- and inter-specific competition in population regulation
- Explain how life history characteristics of different species contribute to their profiles of survival and fecundity
- Why competition occurs, how heterogeneity stabilises species interactions, and why predator-prey interactions tend to cycle
- Understand the basic predator-prey and parasite-host models (Lotka-Volterra, Nicholson-Bailey) and applications to disease dynamics
- Discuss the key traits of trophic cascades and food webs
- Discuss the fundamental importance of insects to understanding population ecology and its links to community ecology
- Discuss applications of population ecology to integrated pest management
- Explain the relevance of bottom-up and top-down regulation to the concept of “why the world is green”
- Discuss scientific versus non-scientific issues of controlling pests
- Discuss the dilemma of increasing realism (complexity) but decreasing tractability (ease of study)
- Show awareness of current research in ecology and evolution

Teaching and Learning Methods

- Classical lectures
- Lab practicals
- Computer-based practicals
- Field practicals
- Analytical workshops
- Self-assessment quizzes
- Small-group discussions

Assessment methods

- Practical write-ups
- MCQs
- Short-answer exam questions
- Essay exam questions

Transferable and Generic Skills

Having successfully completed this minor you will be able to:

- Collect ecological and evolutionary data
- Statistically analyse results and interpret them appropriately
- Produce a report putting results, their analysis and interpretation in a wider context

Teaching and Learning Methods

- Lab practicals
- Computer-based practicals
- Field practicals
- Analytical workshops

Assessment methods

- Practical write-ups

Structure of Minor

1 Typical content

In year 1, the student will be introduced to the main branches of ecology by considering the various levels at which the subject may be studied: individuals, populations, communities and ecosystems. In year 2, the student will build on these basic principles to achieve a broad appreciation of current ecological theory and practice, and of evolutionary processes at the phenotypic and molecular level, and at different time scales.

2 Special Features of the programme

Field practicals in both year 1 and 2. Exposure to current research, allowing students to follow their specific interest, in year 3

3 Details of the minor

Year 1, semester 2 – BIOL1003 (Ecology and Evolution) – ***compulsory***

Year 2, semester 1 – BIOL2004 (Pure and Applied Population Ecology) – ***compulsory***

Year 2, semester 2 – BIOL2001 (Evolution) – ***compulsory***

Year 3, semester 1 – ***either*** BIOL3009 (Applied Ecology) ***or*** BIOL3053 (Biodiversity and Conservation) ***or*** BIOL3067 (Evolution and Development)

Year 3, semester 2 – ***either*** BIOL3010 (Topics in Ecology and Evolution) ***or*** BIOL3056 (Global Change Biology) ***or*** BIOL3068 (Fluxes, Cycles and Microbial Communities)

4 Progression Requirements

The programme of which this minor comprises a part follows the University's regulations for Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes as set out in the University

Calendar <http://www.calendar.soton.ac.uk/sectionIV/progression-regs.html>

In order to qualify for the minor, students must pass all modules that make up the minor. There is no provision for students to be referred in a minor module solely for the purpose of qualifying for the minor.

Please note: This specification provides a concise summary of the main features of the minor and the learning outcomes that a typical student might reasonably be expected to achieve and

demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found on the minor website at http://www.southampton.ac.uk/cip/information_for_students/minor_subjects/index.page?

Revision History

1. May 8, 2014 – first draft
2. August 4, 2014 – CL amendments
3. November 29, 2016 – ARK amendments