

BS212-12 Evolution

20/21

Department

Life Sciences

Level

Undergraduate Level 2

Module leader

Robin Allaby

Credit value

12

Module duration

5 weeks

Assessment

100% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Evolution and genetics are the two great unifying themes in biology. At one level evolution can be defined as the changes in gene frequencies in populations with time. An understanding of population genetics and evolutionary genetics is necessary to understand fundamental processes of evolutionary change, and importantly, is necessary to understand the genetic make-up of existing populations observed and studied in real time. This theoretical background is also necessary to understand the use of DNA sequence data and related information in deducing evolutionary relationships.

[Module web page](#)

Module aims

An understanding of population genetics and evolutionary genetics is necessary to understand fundamental processes of evolutionary change and is necessary to understand the genetic make-up of existing populations observed and studied in real-time. This is natural core material for Biological Science students.

- i) The enduring influence Darwinian thought has on modern evolutionary theory.
- (ii) The 'Modern Synthesis' of Darwinism and genetics.
- (iii) Mechanistic aspects of fundamental evolutionary and population genetic processes at a simple

level.

(iv) The definition of, and distinction between, the different kinds of genetic polymorphism observed in populations, and how polymorphism is maintained.

(v) The consequences of molecular evolutionary theory, including the molecular clock concept, and the use of molecular evolutionary theory for phenetic comparisons and cladistic deductions.

(vi) Different mechanisms of speciation.

(vii) How macro-evolution can be studied through comparative developmental biology and paleontology.

(viii) How evolution is studied at the genome level in the wake of new technologies.

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.

Historical and scientific background of evolutionary theory.

Introduction to 'modern synthesis' or Neo-Darwinism

Variation within species.

Polymorphism - transient and stable.

Molecular evolution.

Taxonomy and cladistics.

Speciation

Adaptation and selection at work

Learning outcomes

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

- Critically analyse the 'modern synthesis' of Darwinism and genetics. Understand quantitative aspects of fundamental evolutionary and popular genetic processes at a simple level. Understand the definition of, and the distinction between, the different kinds of genetic polymorphism observed in populations. Understand how polymorphism is maintained. Critically analyse the consequences of molecular evolutionary theory including the concept of the molecular clock.

Indicative reading list

Freeman and Herron, Evolutionary Analysis 2007

Students are directed to the current literature for an up-to-date appreciation of developments in this area

Subject specific skills

Critically analyse the 'modern synthesis' of Darwinism and genetics.

Understand quantitative aspects of fundamental evolutionary and popular genetic processes at a simple level.

Understand the definition of, and the distinction between, the different kinds of genetic polymorphism observed in populations.

Understand how polymorphism is maintained.

Critically analyse the consequences of molecular evolutionary theory including the concept of the molecular clock.

Transferable skills

1. Quantitative skills
 2. Self directed learning
 3. Adult learning
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Study

Study time

| Type | Required |
|---------------|-----------------------------|
| Lectures | 15 sessions of 1 hour (12%) |
| Private study | 105 hours (88%) |
| Total | 120 hours |

Private study description

Self directed learning and revision for the end of year exam

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 B1

| | Weighting | Study time | Eligible for self-certification |
|----------------------|-----------|------------|---------------------------------|
| Assessment component | | | |
| Online Examination | 100% | | No |

Weighting Study time Eligible for self-certification

Exam: You will have 1 hour to write 2 essays out of a choice of 3 titles.

- Online examination: No Answerbook required

Reassessment component is the same

Feedback on assessment

Final examination feedback is given to returning students as generalised feedback on what constituted a good essay; common mistakes/misconceptions and good practise are identified and shared.

[Past exam papers for BS212](#)

Availability

Courses

This module is Optional for:

- Year 2 of UIPA-C1L8 Undergraduate Life Sciences and Global Sustainable Development