

# LF263-15 Evolution

**26/27**

**Department**

Life Sciences

**Level**

Undergraduate Level 2

**Module leader**

Ian Edwards

**Credit value**

15

**Module duration**

5 weeks

**Assessment**

Multiple

**Study location**

University of Warwick main campus, Coventry

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## 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 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:

- Understanding of the quantitative aspects of fundamental evolutionary and popular genetic processes at a simple level
- Ability to critically analyse the 'modern synthesis' of Darwinism and genetics
- Understanding of the definition of, and the distinction between, the different kinds of genetic polymorphism observed in populations
- Understanding of how polymorphism is maintained
- Ability to critically analyse the consequences of molecular evolutionary theory
- Understanding of molecular clocks

## Indicative reading list

[Reading lists can be found in Talis](#)

## 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 (10%)
Other activity	10 hours (7%)
Private study	93 hours 30 minutes (62%)
Assessment	31 hours 30 minutes (21%)
Total	150 hours

### Private study description

Self-directed learning and revision for the end-of-year exam

### Other activity description

Authentic assessment, based on a common problem or dataset researchers would deal with on a regular basis in the academic environment. This is in-line with both AQSC and RSB requirements on assessments

### 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.

Students can register for this module without taking any assessment.

## Assessment group D2

	<b>Weighting</b>	<b>Study time</b>	<b>Eligible for self-certification</b>
In-class assignment	30%	30 hours	No
Student groups assemble a poster on a given topic expanding their knowledge on the curriculum. Authentic assessment, based on a common problem or dataset researchers would deal with on a regular basis in the academic environment. This is in-line with both AQSC and RSB requirements on assessments.			
Closed-book end-of-year examination	70%	1 hour 30 minutes	No
In-person locally-timetabled closed-book end-of-year examination			

## Assessment group R2

	<b>Weighting</b>	<b>Study time</b>	<b>Eligible for self-certification</b>
Closed-book examination	100%		No
In-person locally-timetabled closed-book examination			

## Feedback on assessment

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

[Past exam papers for LF263](#)

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## Availability

### Courses

This module is Core for:

- Year 2 of UBSA-3 Undergraduate Biological Sciences
- Year 2 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)
- Year 2 of ULFA-C113 Undergraduate Biological Sciences (with Placement Year)
- Year 2 of ULFA-C1A5 Undergraduate Biological Sciences with Industrial Placement (MBio)

This module is Core optional for:

- UIPA-C1L8 Undergraduate Life Sciences and Global Sustainable Development
  - Year 2 of C1L8 Life Sciences and Global Sustainable Development
  - Year 2 of C1LB Life Sciences and Global Sustainable Development: Ecology

This module is Optional for:

- Year 2 of UBSA-C700 Undergraduate Biochemistry
- ULFA-C1A2 Undergraduate Biochemistry (MBio)
  - Year 2 of C1A2 Biochemistry
  - Year 2 of C700 Biochemistry
- Year 2 of ULFA-C702 Undergraduate Biochemistry (with Placement Year)
- Year 2 of ULFA-C1A6 Undergraduate Biochemistry with Industrial Placement (MBio)
- Year 2 of ULFA-B140 Undergraduate Neuroscience (BSc)
- Year 2 of ULFA-B142 Undergraduate Neuroscience (MBio)
- Year 2 of ULFA-B143 Undergraduate Neuroscience (with Industrial Placement) (MBio)
- Year 2 of ULFA-B141 Undergraduate Neuroscience (with Placement Year) (BSc)

This module is Core option list B for:

- Year 2 of UMDA-CF10 Undergraduate Integrated Natural Sciences (MSci)