Module Definition Form (MDF)

Module code: MOD004431	**Version:** 6 **Date Amended:** 20/Apr/2022

1. Module Title
Principles of Genetics and Evolution

2a. Module Leader
Paty Celis

2b. School
School of Life Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions			
Type	**Module Code**	**Module Name**	**Condition**
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	Bsc (Hons) Animal behaviour Bsc (Hons) Animal behaviour (extended degree) Bsc (Hons) Animal behaviour (with sandwich year) Bsc (Hons) Marine and Terrestrial Conservation Bsc (Hons) Marine and Terrestrial Conservation (extended degree) Bsc (Hons) Marine and Terrestrial Conservation (with sandwich year) Bsc (Hons) Zoology Bsc (Hons) Zoology (extended degree) Bsc (Hons) Zoology (with sandwich year)		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

Genetics unifies the biological sciences. Whether you are interested in animal behaviour, biodiversity, conservation or zoology, genetics is pivotal, offering a biological basis for morphological, physiological, and even behavioural traits in an organism. Genetics also gives us a molecular mechanism for the generation and maintenance of variation, and the raw material for evolution.

Building on your knowledge of genetic concepts, you will learn how the rules of inheritance translate into the organisation of the gene-pool of a population and species. You will develop a detailed understanding of the relationship between genetic variation and evolution and will also be introduced to some of the genetic techniques used to answer behavioural, ecological and evolutionary questions. Your understanding of genetic processes will be developed through a variety of integrated lectures, workshops, case studies and laboratory sessions.

You will expand your skillset, developing your expertise in laboratory techniques and report writing useful in research and industry settings, as well as teamwork, problem solving, collection, handling and presentation of data.

6b. Outline Content

- Overview of the fundamental framework of genetics, including basic concepts (DNA structure, genes, alleles and loci) and processes (replication, transcription and translation of DNA)

- Overview of the fundamental framework for evolution (natural selection and its four requirements)

- Types of mutations and the importance of mutations in evolution

- Basis of inheritance and differences between inheritance patterns of nuclear and mitochondrial DNA

- Mendelian and non-Mendelian rules of inheritance

- Hardy Weinberg equilibrium

- Natural selection and genetic drift and their consequences on the gene-pool

- Population genetics: linking patterns in observed genotypes with evolutionary events

- Introduction to genetic techniques and their appropriateness for answering different behavioural, evolutionary and ecological questions

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

General Biology Laboratory Technical Support

7. Learning Outcomes (threshold standards)

No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Explain fundamental genetics concepts using the appropriate terminology.
2	Knowledge and Understanding	Discuss how a variety of genetic techniques can be used to investigate different biological, behavioural and ecological questions.
3	Intellectual, practical, affective and transferrable skills	Critically evaluate previous studies and the results obtained from your own work.
4	Intellectual, practical, affective and transferrable skills	Present information in an organised and clear way, using appropriate technical language.

8a. Module Occurrence to which this MDF Refers

Year	Occurrence	Period	Location	Mode of Delivery
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	22	1-4	2 x 3 hrs + 8 x 2 hrs lecture/active learning
Other teacher managed learning	14	1-4	4 x 2 hr + 1 x 4 hr practicals + 2 hrs revision
Student managed learning	114	1-4	Background reading, online activities, preparation for lectures and practicals, and completion of assessments
TOTAL:	150		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-4	60 (%)	Fine Grade	30 (%)
Coursework (2000 Words)					

Assessment components for Element 010				
Component No.	**Assessment Title**	**Submission Method**	**Weighting (%)**	**Components needed for Mark Calculation?**
010/1	Practical report	Canvas	75 (%)	All
010/2	Quiz 1	Scheduled Activity: Timetabled assessment task	8 (%)	
010/3	Quiz 2	Scheduled Activity: Timetabled assessment task	9 (%)	
010/4	Quiz 3	Scheduled Activity: Timetabled assessment task	8 (%)	

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Examination Cambridge	1 2 4	40 (%)	Fine Grade	30 (%)
Examination (1 hour)					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]