

## Module Specification

Module Title  Module Code   
Credit Value  Level  Mode of Delivery  Semester A

Pre-requisite modules	Co-requisite modules	Overlapping modules
Evolution and Heredity and Gene Action		

### 1) Content Description

Provide a description of the module, as it will appear in the Module Directory and on the Student Information System (approx. 70-80 words).

The module introduced the importance of chromosomal evolution is introduced through the topic of polyploidy: its occurrence, the resulting barriers and consequences; DNA amount: variability and ecological effects: meiotic and mitotic defects, tri and monosomies, B chromosomes, 'parasitic' chromosomes. Evolution of the human genome. You will review the Neo-Darwinian synthesis and how it accounts for Genetic diversity: cheetahs in Africa, *Partula* in the Pacific. The principles are applied in reconstructing evolutionary history from genetic data. The geographic distribution of *Cepaea* genes: neutralism, frequency dependence in selection, founder events, environmental grain. Pre and post zygotic reproductive isolation and speciation illustrated by Hawaiian *Drosophila*.

### 2) Module Aims

Specify the aims of the module, i.e. the broad educational purposes for offering this module.

The module is designed for Molecular Biology/Genetics students with an interest in the origins and consequences of genetic variation and Ecology students with an interest in the processes underlying evolution. It is designed to provide you with an understanding of the genetical and ecological processes underlying evolutionary change; in particular adaptation, differentiation and speciation.

### 3) Learning Outcomes

Identify the learning outcomes for this module, i.e. knowledge, skills and attributes to be developed through completion of this module. Outcomes should be referenced to the relevant [QAA benchmark statements](#) and the [Framework for Higher Education Qualifications in England, Wales and Northern Ireland \(2008\)](#). The [SEEC Credit Level Descriptors for Further and Higher Education 2003](#) and [Queen Mary Statement of Graduate Attributes](#) should also be used as a guiding framework for curriculum design.

Academic Content:	
A 1	Employ the examples of evolutionary studies encountered through the module to illustrate the role of the four major evolutionary processes: mutation, drift, gene flow and selection
A 2	Identify those descriptions of evolution that are based on the naïve proposal that selection tends to produce perfection and be able to recast such descriptions more rigorously in terms of the spread of genetic variation
A 3	Relate and appraise the evidence obtained from laboratory and field studies to investigate the processes responsible for differentiation and speciation
A 4	Illustrate how errors in meiosis and mitosis produce descendants with novel evolutionary trajectories produce chromosomal preparations and construct karyotypes

Disciplinary skills - able to:	
B 1	Understanding of the evolutionary explanations for biological phenomena
B 2	Move on from a Panglossian interpretation of adaptation to a more sophisticated one based on the interplay of stochastic processes
B 3	Understanding the importance of meiotic and cytogenetic processes in an evolutionary context

Attributes:	
C1	Develop understanding of cytogenetic methods
C2	Understanding of the evolutionary process and applying it to a series of examples

#### 4) Reading List

Provide an indicative reading list for the module. This should include key texts and/or journals but **should not** be an exhaustive list of materials.

Evolution and Ecology of the Organism Michael Rose & Laurence Mueller ISBN 0130104043

Evolutionary Analysis. Scott Freeman, Jon Herron. ISBN: 0131018590

Further set reading selection from recent papers in the field is posted on the module website.

#### 5) Teaching and Learning Profile

Provide details of the method of delivery (lectures, seminars, fieldwork, practical classes, etc.) used to enable the achievement of learning outcomes and an indicative number of hours for each activity to give an overall picture of the workload a student taking the module would be expected to undertake. This information will form the Key Information Set for each undergraduate programme and will be used to populate the KIS widget found on the QMUL programme information pages. More information can be found [online](#) about KIS. You may also wish to refer to the [QAA guidance on contact hours](#) when completing this section.

Activity Type	KIS Category	Time Spent (in hours)
Lecture	Scheduled	22
Practical Workshops	Scheduled	11
Total		32

Specify the total module notional study hours. This should be a total of the hours given for each activity. The notional study hours for each academic credit point is 10. A 15 credit point module therefore represents 150 notional study hours.

Activity Type	Total Time Spent (in hours)	Percentage of Time Spent
Scheduled learning and teaching	32	21.3
Placement	7	4.7
Independent Study	111	74
Total	150	100

Use the information provided in the box above to specify the total time spent and the percentage time spent in each category of teaching and learning activity.

## 6) Assessment Profile

Provide details of the assessment methods used to assess the achievement of learning outcomes.

Description of Assessment	Assessment Type	KIS Category	Duration/Length	Percentage Weighting	Final element of assessment	Qualifying Mark
Written Examination	Examination	Written Exam	2 Hours and 30 Minutes	75%	Yes	
Coursework	Practical	Coursework		25%	No	

**Final element of assessment:** The assessment that takes place last. There should normally be only one element of assessment marked as final unless two assessment or submission dates occur on the same day.

**Qualifying mark:** A specified minimum mark that must be obtained in one or more elements of assessment in order to pass a module. This is in addition to, and distinct from, the requirement to achieve a pass in the module mark to pass the module.

## Reassessment

Provide details of the reassessment methods used, specifying whether reassessment is either standard reassessment or synoptic reassessment.

- Standard Reassessment       Synoptic Reassessment

Synoptic reassessment details (if you have indicated synoptic reassessment above, please give details)		
Brief Description of Assessment	Assessment Type	Duration/Length of Examination/ Coursework
Resit Examination	Written Exam	2 Hours and 30 Minutes