Liverpool John Moores University

Title:	GENETICS AND EVOLUTION
Status:	Definitive but changes made
Code:	**4002NATSCI** (112569)
Version Start Date:	01-08-2015
Owning School/Faculty:	Natural Sciences & Psychology
Teaching School/Faculty:	Natural Sciences & Psychology

Team	Leader
Richard Brown	Y
Robbie Rae	
Carlo Meloro	
Elaine Hemers	
Jeremy Bird	
Clare Milsom	

Academic Level:	FHEQ4	**Credit Value:**	24.00	**Total Delivered Hours:**	61.50
Total Learning Hours:	240	**Private Study:**	178		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	38.000
Practical	16.000
Workshop	6.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	EXAM	MCQs	50.0	1.50
Test	Prac test	Phase test	50.0	1.00

Aims

To i) explain fundamental genetic principles, ii) describe the main evolutionary

processes from a genetics perspective, iii) examine past and present diversity of life on earth.

Learning Outcomes

After completing the module the student should be able to:

1 explain the molecular basis of genetic diversity.
2 describe and interpret Mendelian and non-Mendelian patterns of inheritance in eukaryotes
3 identify and describe the processes that affect genetic diversity within populations
4 describe the main features of evolution of life on earth.
5 recognize the processes that have led to past and present morphological and species diversity.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5
Test	1	2	5		

Outline Syllabus

Structure of the basic biomolecules, prokaryotes and eukaryotes, eukaryotic chromosomes and theory of inheritance, mitosis and meiosis, transcription and translation.

Mendelian genetics: mono and dihybrid crosses, sex determination and linkage, chromosomal mapping, cytogenetics, variations in chromosome number, non-Mendelian inheritance, human genetic disease, the human genome project.

Molecular genetics: the nature of the gene, the genetic code, detection of genotype, gene expression and its control. Applications of genetics to fields within Biology/Zoology/Anthropology.

Population genetics: Hardy-Weinberg equilibrium, drift, selection and migration.

Darwinian evolution and the modern synthesis: speciation, maintenance of polymorphisms, altruism, mimicry, kin selection, sexual selection, inclusive fitness, co-evolution of different organisms (e.g. symbionts).

Diversity and taxonomy: phylogenetic relationships among the major animal groups, principles of taxonomy and systematics, identification and biology of the major living and fossil groups, the evolution of form.

Evolution evidenced by the fossil record: origin of metazoans, late pre-Cambrian diversification, Burgess shale fauna, colonisation of the land, origins of vertebrates,

examples of radiations within specific groups, macroevolutionary patterns, mass extinctions.

Learning Activities

Lectures, workshops and practicals.

Notes

This module explains basic genetic principles in eukaryotic organisms and uses this background to introduce the processes by which life has evolved on earth. The diversity of life is examined from both genetic and morphological perspectives. Considerable emphasis is given to the fossil record and how it has helped our understanding of evolutionary history.