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MODULE DESCRIPTOR

Module Title

Genetics and Molecular Biology

Reference	AS2903	Version	2
Created	February 2017	SCQF Level	SCQF 8
Approved	May 2011	SCQF Points	30
Amended	March 2018	ECTS Points	15

Aims of Module

To provide students with the ability to discuss the significance and fundamental aspects of genetics and molecular biology.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Apply the principles of genetic inheritance to predicting phenotypic outcomes of inherited characteristics and disorders.
2	Understand and discuss the role of molecular biology in genetic investigations, gene screening and gene therapy techniques.
3	Describe the processes required for and the factors affecting gene expression in prokaryotes and eukaryotes.
4	Explain in detail the methods employed for nucleic acid analysis and constructing recombinant DNA.
5	Using safe and effective practice, perform a range of molecular biology techniques and experimental procedures.

Indicative Module Content

Genetic inheritance patterns, autosomal and sex-linked genes, pedigree analysis, blood group inheritance, population genetics, cytogenetics. chromosomal abnormalities, multifactorial inheritance, genetic screening, gene therapy. Genomes, nuclear DNA, mitochondrial DNA, chloroplast DNA. Gene expression, gene structure and gene regulation in prokaryotes and eukaryotes. Mutation and mutagens. Epigenetics. Nucleic acid analysis: DNA and mRNA extraction, cDNA synthesis, PCR, restriction digestion, sequencing, hybridisation, gene cloning, gel electrophoresis. The laboratory programme will consist of core molecular biology experiments used for DNA analysis. Application of genetics and molecular biology in the context of forensic science, biomedical science and nutrition.

Module Delivery

This is a lecture based module supplemented with tutorials and practical laboratory classes.

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Indicative Student Workload	Full Time	Part Time
Contact Hours	85	N/A
Non-Contact Hours	215	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Examination	Weighting:	70%	Outcomes Assessed:	1, 2, 3, 4
Description:	Closed book written examination				

Component 2

Type:	Practical Exam	Weighting:	30%	Outcomes Assessed:	5
Description:	Lab knowledge and conduct are assessed				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

This module is assessed using the two components of assessment detailed in the Assessment Plan. To pass this module, candidates must achieve a Module Grade D or better.

Module Grade	Minimum Requirements to achieve Module Grade:
A	Final aggregate mark of 70% and a minimum of 35% in C1 and C2
B	Final aggregate mark of between 60-69% and a minimum of 35% in C1 and C2
C	Final aggregate mark of between 50-59% and a minimum of 35% in C1 and C2
D	Final aggregate mark of between 40-49% and a minimum of 35% in C1 and C2
E	MARGINAL FAIL. Final aggregate mark of between 35-39% and a minimum of 35% in C1 and C2
F	FAIL. A mark of less than 35% in either component
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	Successful completion of Stage 1 of the course or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1. GRIFFITHS, A.J.F. et al *An Introduction to Genetic Analysis.* Current Edition. W H Freeman.
2. LEWIS, R. *Human Genetics: Concepts and Applications.* Current Edition. McGraw-Hill Higher Education
3. BROWN, T.A. *Gene Cloning and DNA Analysis: an Introduction.* Current Edition. Wiley-Blackwell.