MODULE DESCRIPTOR

Module Title

Genetics and Molecular Biology

Reference	PL2903	Version	1
Created	October 2022	SCQF Level	SCQF 8
Approved	June 2023	SCQF Points	30
Amended	August 2021	ECTS Points	15

Aims of Module

To provide students with the ability to discuss the fundamental aspects of genetics and molecular biology and their significance to forensic, biomedical and biological science.

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	Explain 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.

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.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	65	N/A
Non-Contact Hours	235	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:	100%	Outcomes Assessed:	1, 2, 3, 4
Description:	Closed book examination				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

Component 1 (CW1) comprises 100% of the module grade. A minimum of a Grade D is required to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A
B	B
C	C
D	D
E	E
F	F
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None, in addition to SCQF level 8 entry requirements or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	GRIFFITHS, A.J.F. et al. 2011. An Introduction to Genetic Analysis. 1st Edition. Freeman.
2	LEWIS, R. 2017. Human Genetics: Concepts and Applications. 1st Edition. McGraw-Hill.
3	BROWN, T.A. 2020. Gene Cloning and DNA Analysis: an Introduction. 8th Edition. Wiley-Blackwell.