

MODULE DESCRIPTOR

Module Title

Molecular Biology And Human Genetics

Reference	AS2906	Version	2
Created	August 2017	SCQF Level	SCQF 8
Approved	May 2011	SCQF Points	15
Amended	August 2017	ECTS Points	7.5

Aims of Module

To provide students with the ability to examine the major elements associated with recombinant DNA technology, nucleic acid analysis and human genetics and heredity.

Learning Outcomes for Module

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

- 1 Describe molecular cloning procedures, including restriction endonucleases, expression vectors and recombinant selection systems.
- 2 Explain the methods employed for DNA, RNA and protein analysis, including gel electrophoresis, hybridisation, polymerase chain reaction and sequencing.
- 3 Apply Mendelian principles in humangenetic investigation and discuss genetic screening and gene therapy techniques.
- 4 Predict phenotypic outcomes of inherited characteristics and disorders.
- 5 Discuss the impact of current trends and modern techniques in molecular biology on pathological investigation.

Indicative Module Content

Molecular Biology: restriction endonucleases; recombinant DNA formation; ligation; cloning strategies; bacterial expression vectors - plasmids, phage, selection of recombinant clones; mammalian expression vectors; transfection; genetic immunological and nucleic acid based detection methods; mRNA, cDNA, PCR, gel electrophoresis; Southern, Northern and Western hybridisation; sequencing; RFLP; VNTR; Human Genetics: Mendelian and non-Mendelian inheritance, genetic probability, complex dominance, ABO and Rhesus blood groups, sex determination, sex-linked disorders, mutagens and DNA repair mechanisms, cancer inheritance and multifactorial inheritance, genetic screening, gene therapy.

Module Delivery

This is a lecture-based course supplemented with tutorial sessions.

Indicative Student Workload	Full Time	Part Time
Contact Hours	40	N/A
Non-Contact Hours	110	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	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, 5
Description:	Composed of short answer and extended response questions on Molecular Biology and Human Genetics.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

This module is assessed using the one component 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% or better.
B	Final aggregate mark of between 60-69%.
C	Final aggregate mark of between 50-59%.
D	Final aggregate mark of between 40-49%.
E	MARGINAL FAIL. Final aggregate mark of between 35-39%.
F	FAIL. A mark of less than 35%.
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 an equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	BROWN, T.A., 2016. <i>Gene Cloning and DNA Analysis: an Introduction</i> . 7th ed. Wiley-Blackwell.
2	LEWIS, R., 2014. <i>Human Genetics: Concepts and Applications</i> 11th ed. McGraw-Hill Higher Education
3	LODGE, J., LUND, P. and MINCHIN, S. 2006 <i>Gene Cloning - Principles and Applications</i> 1st ed. Taylor & Francis.
4	NICHOLL, D.S.T. 2008 <i>An Introduction to Genetic Engineering</i> 3rd ed. Cambridge University Press.