

## 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
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**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:
<b>A</b>	Final aggregate mark of 70% or better.
<b>B</b>	Final aggregate mark of between 60-69%.
<b>C</b>	Final aggregate mark of between 50-59%.
<b>D</b>	Final aggregate mark of between 40-49%.
<b>E</b>	MARGINAL FAIL. Final aggregate mark of between 35-39%.
<b>F</b>	FAIL. A mark of less than 35%.
<b>NS</b>	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.