

Module Title Molecular Biology And Human Genetics	Reference AS2906 SCQF SCQF Level 8 SCQF Points 15 ECTS Points 7.5 Created July 2002 Approved May 2011 Amended May 2008 Version No. 1
Keywords Recombinant DNA technology; expression vectors; selection systems; PCR; heredity; gene therapy.	

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

Successful completion of stage 1 of the course or an equivalent.

Corequisite Modules

None.

Precluded Modules

None.

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.

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.

Indicative Student Workload

<i>Contact Hours</i>	Full Time
Lectures/Tutorials	40
<i>Directed Study</i>	
Directed Study	40
<i>Private Study</i>	
Private Study	70

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 human genetic 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

Mode of Delivery

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

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2,3,4,5

Component 1 is assessed by a closed book examination.

Indicative Bibliography

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

vectors; transfection; genetic
immunological and nucleic acid
based detection methods;
mRNA, cDNA, PCR, gel
electrophoresis; Southern,
Northern and Western
hybridisation; sequencing;
RFLP; VNTR;