

MODULE DESCRIPTOR

Module Title

DNA Technologies

Reference	AS4074	Version	5
Created	July 2017	SCQF Level	SCQF 10
Approved	July 2005	SCQF Points	30
Amended	August 2017	ECTS Points	15

Aims of Module

To provide students with the concepts and principles of DNA typing and profiling, in biotechnology and forensic science. To appreciate the importance of biotechnology in society and to understand the relevance of population genetics.

Learning Outcomes for Module

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

- 1 Assess and discuss the history of DNA profiling.
- 2 Understand and critically assess the utilisation of the chosen method of DNA profiling in a specific investigation.
- 3 Discuss the relevance of population genetics in forensic science, population and evolution studies.
- 4 Discuss the optimisation and applications of gene cloning.
- 5 Critically assess the importance of biotechnological processes and products in medicine, agriculture and the food industry.

Indicative Module Content

History of DNA profiling, DNA handling and typing. STR, VNTR, SNP, Y chromosome STRs, mitochondrial DNA and multiplex PCR, their advantages and disadvantages in forensic science applications. Wildlife forensic, conservation biology and medical applications of DNA profiling. Hardy-Weinberg and allele frequencies, population statistics and databases used in DNA profiling. Genetic engineering; cloning technologies; optimisation of gene expression; transgenic organisms; plant, animal and microbial expression systems.

Module Delivery

This is a lecture based module supplemented by directed reading and tutorials, together with practical laboratory sessions.

Indicative Student Workload	Full Time	Part Time
Contact Hours	80	N/A
Non-Contact Hours	220	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	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: 70% Outcomes Assessed: 2, 3, 4, 5
 Description: Closed book written examination

Component 2

Type: Coursework Weighting: 30% Outcomes Assessed: 1
 Description: Essay

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

This module is assessed using the two components of assessment as detailed in the Assessment Plan. To pass the 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 greater 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. Overall mark of between 35-39% and a minimum of 35% in C1 and C2
F	FAIL. A mark of less than 35% in C1 or C2
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	AS2099, AS3017 or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 GLICK, B.R., PASTERNAK, J.J. and PATTEN, C.L. *Molecular Biotechnology*. Current Edition. American Society for Microbiology.
- 2 BROWN, T.A. *Gene Cloning and DNA Analysis: an Introduction*. Current Edition. Wiley-Blackwell.
- 3 DALE, J.W. and VON SCHANTZ, M. *From Genes to Genomes. Concepts and applications of DNA Technology*. Current Edition. Wiley-Blackwell.
- 4 BUTLER, J.M. *Fundamentals of Forensic DNA Typing*. Current Edition. Academic Press.
- 5 GOODWIN, W., LINACRE, A. and HADI, S. *An Introduction to Forensic Genetics*. Current Edition. Wiley-Blackwell.
- 6 HARTL, D.L. and CLARK A.G. *Principles of Population Genetics*. Current Edition. Sinauer Associates.