Module Title **DNA Technologies** **Keywords** DNA typing/profiling, Gene cloning, Genetic Engineering, Lineage markers, Population Genetics	Reference AS4074 SCQF SCQF Level 10 SCQF Points 30 ECTS Points 15 Created February 2004 Approved July 2005 Amended May 2011 Version No. 4

This Version is No Longer Current

The latest version of this module is available here

Prerequisites for Module

AS2099, AS3017 or equivalent

Corequisite Modules

None.

Precluded Modules

None.

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

Genetic engineering; cloning technologies; optimisation of gene expression; transgenic organisms; plant, animal and microbial expression systems.

Indicative Student Workload

Contact Hours	Full Time
Laboratory Work	24
Lectures	40
Tutorials	16
Directed Study	80
Private Study	140

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

Mode of Delivery

The course will be delivered through formal lectures, directed reading and tutorials together with practical laboratory sessions.

Assessment Plan

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

Component 2 is an essay.

Component 1 is a closed book examination

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. adn VON SCHANTZ, M. *From Genes to Genomes. Concepts and applications of DNA Technology.* Current Edition. Wiley-Blackwell.

forensic, conservation biology and medical applications of DNA profiling. Hardy-Weinberg and allele frequencies, population statistics and databases used in DNA profiling.

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.