Module Definition Form (MDF)

Module code: MOD008792	**Version:** 1 **Date Amended:** 22/Mar/2022

1. Module Title
Introduction to Forensic Genetics

2a. Module Leader
Pet-Paul Wepeba

2b. School
School of Life Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	None		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

One of the most powerful tools for identifying individuals at a crime scene is through DNA analysis. You will gain a detailed knowledge of the fundamental principles of forensic genetics in order to be able to analyse samples and determine their origin. You will be introduced to the relevant accreditation procedures for crime scenes and laboratory (International organisation for Standardisation – including ISO 17020 and ISO 17025) and learn how to perform preliminary tests of biological fluids. You will carry out the full process of DNA analysis including: sample extraction, DNA quantification, amplification, fragment analysis and data analysis through a series of interactive lectures, tutorials and practical sessions. You will also learn to apply the statistical interpretation of single source. In addition to current DNA analytical methods such as using short tandem repeats (STRs) and DNA-17 profiling, you will also learn about other markers including mitochondrial DNA (mtDNA), Y- chromosome STRs, and single nucleotide polymorphisms (SNPs). The combination of theoretical and practical skills gained during the module are highly transferable for the forensic, clinical, and biological laboratory and other job opportunities.

6b. Outline Content

- DNA structure, function, and replication – basics of DNA structure and sequence information resulting in proteins through the process of transcription and translation.
- Use of different DNA markers for human identification.
- Crime Scene examination for biological material, recovery and packaging of biological evidence.
- Body fluid identification and analysis - body fluids commonly found at the scene of crime, methods used for recovery of biological evidence including, preliminary identification and confirmatory tests.
- DNA workflow - principles and practical aspects of generating DNA profiles from biological evidence. Processes include sample collection, extraction, quantification, amplification, separation of fragments and analysis of DNA profiles
- Statistical interpretation of DNA profiles (single sources) – principles of population genetics to explain the statistics involved (profile frequencies, random match probability, likelihood ratio).

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

None

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Describe in detail the structure, function, replication and transcription of DNA.
2	Knowledge and Understanding	Explain how biological variation in DNA occurs and is analysed within a forensic context.
3	Intellectual, practical, affective and transferrable skills	Evaluate, interpret and report upon the data generated by DNA analysis.
4	Intellectual, practical, affective and transferrable skills	Collect, extract, quantify, amplify and separate DNA fragments and interpret the results.

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	21	1-4	1 x 1 hr and 10 x 2 hrs lectures/active learning
Other teacher managed learning	15	2-4	3 x 2 hrs + 2 x 4 hrs practicals; test x 1 hr
Student managed learning	114	1-4	Background reading, online activities, preparation for lectures and practicals, and completion of assessments
TOTAL:	150		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Coursework	2-4	60 (%)	Fine Grade	30 (%)
Practical assessment (750 words) and lab report (1250 words)					

Assessment components for Element 010

Component No.	Assessment Title	Submission Method	Weighting (%)	Components needed for Mark Calculation?
010/1	Practical assessment (750 words)	Scheduled Activity: Timetabled assessment task	25 (%)	All
010/2	Lab report (1250 words)	Canvas	75 (%)	

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Practical	1-4	40 (%)	Fine Grade	30 (%)
Test (1000 words equivalent)					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]