



## **Module Specification**

### **Forensic Biology**

Version: 2023-24, v2.0, 05 Apr 2023

#### **Contents**

<b>Module Specification .....</b>	<b>1</b>
<b>Part 1: Information .....</b>	<b>2</b>
<b>Part 2: Description .....</b>	<b>2</b>
<b>Part 3: Teaching and learning methods .....</b>	<b>4</b>
<b>Part 4: Assessment.....</b>	<b>4</b>
<b>Part 5: Contributes towards .....</b>	<b>6</b>

## Part 1: Information

**Module title:** Forensic Biology

**Module code:** USSKB8-15-2

**Level:** Level 5

**For implementation from:** 2023-24

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Health & Applied Sciences

**Department:** HAS Dept of Applied Sciences

**Partner institutions:** None

**Field:** Applied Sciences

**Module type:** Module

**Pre-requisites:** Human Biological Systems 2023-24

**Excluded combinations:** Instrumental Analytical Science 2023-24, Medicinal Chemistry 2023-24

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** Pre-requisites: students must have USSJRU-30-1 Human Biological Systems.

**Features:** Not applicable

**Educational aims:** This module examines how forensic scientists identify biological materials and analyse such materials to obtain genetic information relating to the donor for both human and non-human species.

**Outline syllabus:** Identification of biological material:

Immunological assays; an introduction to antibodies and antigens, including antigen-antibody binding reactions; primary and secondary reactions, precipitation and agglutination. Production of monoclonal and polyclonal antibodies.

Forensic application of primary binding assays. Enzyme-linked immunosorbent assay for the detection of seminal stains and saliva; immunochromatographic assays for the identification of blood, saliva and semen.

Forensic application of secondary binding assays. Precipitation-based assays such as immunodiffusion, Ouchterlony and electrophoretic methods used for species identification and to distinguish vaginal and seminal secretions.

Forensic application of RNA based assays. Detection of specific types of mRNA expressed exclusively in certain cells to identify body fluids. Real-time PCR to detect gene expression levels of mRNAs.

Genetic information relating to both human and non-human species:

Genetic linkage. Genetic assignment to a relative, a population or geographic region for human and nonhuman species. Use of STRs and their characterisation.

Real-time PCR. Basic principles for the use of real-time PCR including real-time fluorescence-based quantitative polymerase chain reaction, PCR microchip applications in forensic analysis, and PCR methods based on mitochondrial gene.

Population genetics. An introduction to allele and genotype frequency, including an investigation of Hardy-Weinberg principles and testing HW proportions for population databases.

### Part 3: Teaching and learning methods

**Teaching and learning methods:** Lecture and tutorial sessions will provide opportunities for data handling and interpretation, problem solving and discussions with academic staff.

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Describe and critically assess the use of immunological assays to indicate the presence of body fluids and relate these to sensitivity and specificity

**MO2** Research and evaluate in detail the use of messenger RNA transcripts that are specific to each type of body fluid and evaluate the use of transcripts with constant degradation rates for determination of the age of biological material

**MO3** Discuss the common underlying principles of DNA typing of human and nonhuman DNA and relate this to species testing, genetic linkage and primer design

**MO4** Discuss the common underlying principles of population genetics and relate this to the use of frequency databases used in forensic DNA analysis

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 117 hours

Face-to-face learning = 33 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/usskb8-15-2.html) via the following link <https://uwe.rl.talis.com/modules/usskb8-15-2.html>

### Part 4: Assessment

**Assessment strategy:** The Assessment Strategy has been designed to support and enhance the development of both subject-based and employability skills, whilst ensuring that the modules Learning Outcomes are attained, as described below.

Assessment Task 1 is an online written assessment over a 24 hour period. This will provide a valuable learning experience through recalling and demonstrating knowledge which will be of benefit when progressing to final year modules.

The coursework (Assessment Task 2) comprises an essay which entails a critique of techniques used to confirm the presence of body fluids in forensic biology. Understanding the appropriate test and sequence of analysis is a vital skill for forensic biology students; consequently this assessment can be described as an assessment to enhance employability and learning.

Opportunities for formative assessment, discussion of current research and the evaluation of research methods are built into the lectorial sessions. All work is marked in line with the Faculty Generic Assessment Criteria and conforms to university policies for the setting, collection, marking and return of student work.

**Assessment tasks:**

**Examination (Online)** (First Sit)

Description: Online examination (24 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

**Written Assignment** (First Sit)

Description: Essay (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2

**Examination (Online) (Resit)**

Description: Online Examination (24 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

**Written Assignment (Resit)**

Description: Essay (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Forensic Science [Frenchay] MSci 2022-23

Forensic Science [Frenchay] BSc (Hons) 2022-23

Forensic Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2021-22

Forensic Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2021-22

Forensic Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2021-22

Forensic Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22