# MODULE SPECIFICATION

| Part 1: Information | | | |
|---|---|---|---|
| Module Title | Forensic Analysis and Toxicology | | |
| Module Code | USSJUR-30-3 | Level | 3 |
| For implementation from | September 2019 | | |
| UWE Credit Rating | 30 | ECTS Credit Rating | 15 |
| Faculty | Health and Applied Sciences | Field | Applied Sciences |
| Department | Applied Sciences | | |
| Contributes towards | BSc (Hons.)Forensic Science (with foundation year), BSc (Hons.) Forensic Science, MSci Forensic Science, MSci Forensic Science (with foundation year) | | |
| Module type: | Standard | | |
| Pre-requisites | USSKB9-15-2 Instrumental Analytical Science | | |
| Excluded Combinations | USSJUP-30-3 Forensic Biology and Genetics; USSKBF-30-3 Genomic Technologies | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

## Part 2: Description

The content of the module is delivered through a mixture of lectures, tutorial classes and practical classes and includes:

- *Forensic Toxicology:* Pharmacokinetics and metabolism of drugs of abuse and other toxic substances, including synergistic and idiosyncratic effects. *Ante-mortem* and *post-mortem* testing for a range of metabolites. Selection of analyte and specimen type; evidence integrity and preservation. Quality control and regulatory aspects. Interpretation of toxicological results - research data, individual variation, multiple factors.
- *Forensic Analysis:* Issues relating to the use of GC, HPLC, FTIR, uv-vis spectrophotometry, X-ray analysis and mass spectrometry (including combined techniques) for a wide range of forensic evidence types. Electrochemical sensors/biosensors as applied to forensic analysis. Selection of method for a range of analyses considering analytes, matrices, sample size and concentration in a forensic context. Examples may include drugs, poisons, fire accelerants, explosives, firearms discharge residues, paint, glass, plastics, soil, inks, fibres, dyes. Key requirements for forensic casework. Commonly encountered synthetic routes to poisons and drugs. Potential hazards of investigating illicit laboratories - principles and strategies. Elements of risk assessment.
- *Sampling issues and sample preparation:* Extraction and/or matrix matching. Presumptive testing of drugs. Optimisation of analytical methods, especially for chromatography, mass spectrometry and atomic spectroscopy. Derivatisation to improve compound stability and method sensitivity.
- *Interpretation of results:* Evaluation of methods and results including application of appropriate statistical testing, specification testing, data presentation, valid comparisons and conclusions in context with reference to research literature and databases. Communication to a lay audience (jury in court).
- *Drugs legislation:* national and international processes for monitoring drug supply and abuse. Legislation relating to driving under the influence of alcohol and drugs.

| Generic Graduate Skill | *Specific strand - Optional* | Introduced | Practiced | Evidenced |
|---|---|---|---|---|
| **1. Communication** | | ☐ | ☒ | ☒ |
| **2. Professionalism** | | ☐ | ☒ | ☒ |
| **3. Critical Thinking** | | ☐ | ☒ | ☒ |
| **4. Digital Fluency** | | ☐ | ☒ | ☒ |
| **5. Innovative and Enterprising** | | ☐ | ☐ | ☒ |
| **6. Forward Looking** | | ☐ | ☐ | ☐ |
| **7. Emotional Intelligence** | | ☐ | ☐ | ☐ |
| **8. Globally Engaged** | | ☐ | ☐ | ☐ |

**Part 3: Assessment: Strategy and Details**

The problem-solving approach in tutorial sessions and laboratory exercises enables students to reflect on and refine their knowledge, understanding and skills throughout the programme of study. Informal formative feedback is given throughout these learning situations, enabling students to evidence their achievements in the summative assessments.

Students work in pairs in laboratory sessions but produce individual contemporaneous laboratory examination records, in keeping with professional practice in forensic science. The laboratory examination record is a detailed documentation of all laboratory work and includes anti-contamination procedures, analytical procedure and results and their critical evaluation. Students must submit a record for each laboratory practical class.

The controlled component is composed of two unseen examinations. These assessments allow students to demonstrate their ability to research, prioritise information and produce a structured, evidence based answer. A written exam is the appropriate summative assessment of knowledge and understanding and cognitive skills relating to major aspects of the syllabus.

All work is marked in line with the Faculty of Health and Applied Sciences Generic Assessment Criteria for level 3.

| | | |
|---|---|---|
| Identify final timetabled piece of assessment (component and element) | A2 | |
| **% weighting between components A and B** (Standard modules only) | **A:** **50** | **B**: **50** |
| **First Sit** | | |
| **Component A** (controlled conditions) **Description of each element** | **Element weighting** | |
| 1. Unseen exam (1.5 hours) | **50%** | |
| 2. Unseen exam (1.5 hours) | **50%** | |
| **Component B** **Description of each element** | **Element weighting** | |
| Laboratory Examination Records including critical evaluation. | **100%** | |
| **Resit (further attendance at taught classes is not required)** | | |
| **Component A** (controlled conditions) **Description of each element** | **Element weighting** | |
| 1. Unseen exam (3 hours) | **50%** | |
| **Component B** **Description of each element** | **Element weighting** | |

| | |
|---|---|
| Laboratory Examination Records including critical evaluation produced from provided data. | **100%** |

**Part 4: Learning Outcomes & KIS Data**

**Learning Outcomes**

On successful completion of this module students will be able to:

- Devise strategies for the selection, preservation and analysis of specimens in forensic toxicology, demonstrating knowledge of pharmacokinetics and metabolism. (A and B)
- Undertake the preparation and analysis of drugs and toxicological samples, using a broad range of industry standard analytical instrumentation (B).
- Critically evaluate methods for and data produced from the analysis of forensic and toxicological evidence. (A and B)
- Produce and present laboratory examination records to a professional standard. (component B)

**Key Information Sets Information (KIS)**

**Key Information Set - Module data**

*Number of credits for this module* 30

**Contact Hours**

| Hours to be allocated | Scheduled learning and teaching study hours | Independent study hours | Placement study hours | Allocated Hours |
|---|---|---|---|---|
| 300 | 72 | 228 | 0 | 300 |

The table below indicates as a percentage the total assessment of the module which constitutes a;

**Written Exam**: Unseen written exam.
**Coursework**: Written report and contemporaneous notebook.

**Total Assessment**

| Total assessment of the module: | |
|---|---|
| Written exam assessment percentage | 50% |
| Coursework assessment percentage | 50% |
| | 100% |

**Reading List**

https://rl.talis.com/3/uwe/lists/A89D32A6-30B9-1DD7-8A85-86E3B6823B8C.html?lang=en-GB&login=1

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|---|---|---|---|---|
| First CAP Approval Date | 2 February 2019 | | | |
| Revision CAP Approval Date *Update this row each time a change goes to CAP* | 29 May 2019 | Version | 2 | RIA 12905 |