Module Specification

Forensic Analysis and Toxicology

Version: 2023-24, v3.0, 16 Jun 2023

Contents

Part 1: Information

Module title: Forensic Analysis and Toxicology

Module code: USSJUR-30-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Health & Applied Sciences

Department: HAS Dept of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: Instrumental Analytical Science 2022-23

Excluded combinations: Forensic Biology and Genetics 2023-24, Genomic Technologies 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 passed USSKB9-15-2 Instrumental Analytical Science.
Co-requisites: students must take USSKBQ-30-3 Advanced Analytical Science.

Features: Excluded Combinations: USSJUP-30-3 Forensic Biology and Genetics; USSKBF-30-3 Genomic Technologies

Educational aims: See Learning Outcomes.

Outline syllabus: 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 Skills:-

Practiced and Evidenced:
Communication
Professionalism
Critical Thinking
Digital Fluency

Evidenced:
Innovative and Enterprising

Part 3: Teaching and learning methods

Teaching and learning methods: The content of the module is delivered through a mixture of lectures, tutorial classes and practical classes.

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

MO1 Devise strategies for the selection, preservation and analysis of specimens in forensic toxicology, demonstrating knowledge of pharmacokinetics and metabolism

MO2 Undertake the preparation and analysis of drugs and toxicological samples, using a broad range of industry standard analytical instrumentation

MO3 Critically evaluate methods for and data produced from the analysis of forensic and toxicological evidence

MO4 Produce and present laboratory examination records to a professional standard

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ussjur-30-3.html

Part 4: Assessment

Assessment strategy: The problem-solving approach in virtual and practical 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.

Assessment 1 is six individual contemporaneous laboratory examination records for both virtual and practical exercises, 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 exercise.

Assessment 2 is an unseen online examination. 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.

Assessment tasks:

Professional Practice Report (First Sit)
Description: Laboratory Examination Records including critical evaluation.
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (First Sit)

Description: Online examination (24 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3

Professional Practice Report (Resit)

Description: Laboratory Examination Records including critical evaluation.

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (Resit)

Description: Online examination (24 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Forensic Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Forensic Science [Sep][FT][Frenchay][4yrs] MSci 2021-22

Forensic Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Forensic Science [Sep][SW][Frenchay][5yrs] MSci 2020-21

Forensic Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2020-21

Forensic Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21

Forensic Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Forensic Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2019-20