Aims of the module

This module develops students’ understanding of pharmacology, biochemistry, pathology and toxicology and their application in forensic investigations. The outline content is as follows: a review of the various analytical techniques available to the toxicologist; methodologies for detecting foreign substances in tissues and body fluids and interpretation of the data acquired; the relevant legal aspects governing the presentation of toxicological evidence in written reports and in court. Extensive use of case studies will develop the principles of toxicology and enable students to appreciate and apply toxicology both in the laboratory and in the field.

Learning Outcomes

On successful completion of this module, you will be able to:

- Understand how the disciplines of biochemistry, pharmacology, pathology and toxicology can be applied to crime solving.
- Appreciate and understand the importance of tissue characterization, autopsy and...
inquest.
- Be familiar with the analytical techniques most commonly used in toxicology for crime solving and have an awareness of their limitations.
- Understand how relevant aspects of Civil and Criminal law relate to the presentation of evidence from toxicological investigations.
- Communicate to both specialist and non-specialist audiences, in the role of an Expert Witness by expressing the interpretation of results in a manner comprehensible to the intended recipient.
- Suggest methods for detecting foreign compounds in fresh and aged body fluids and tissues and recognise the symptomology of poisoning by foreign compounds.
- Illustrate principles of Forensic Toxicology with reference to a variety of industrial, environmental, agricultural and natural compounds, including drugs and alcohol in particular.
- Understand the importance of method validation and laboratory standards

**IMPORTANT CONTACTS**

**Module tutor**
Dr David F Thompson  
LJ0.17A  (7)34954  d.f.thompson@keele.ac.uk

**Other academic staff**
Dr Matthew O’Brien  
LJ1.44  (7)34371  m.obrien@keele.ac.uk

**Guest Lecturers**
Prof Robin Braithwaite (Honorary Senior Lecturer)  
Dr Mike Mahon (Medical School)  
Dr Amandeep Mann (guest speaker/UHNS)

**TIMES OF CLASSES**

**Lectures:**
Thursday 1pm – 2pm  
Friday 10am –11am

**Laboratory/PBL:**
Monday 2pm – 5pm

**Laboratory/PBL Timetable**

Please refer to the Year 3 Academic Timetable for specific details. The laboratory component for this module comprises a 3 hour lab run by Keele Medical School staff (human anatomy, liver physiology and pathology), and two 3 hour Problem-Based Learning (PBL) workshops (you will only be required to attend 2 of the 3 PBL sessions, a separate list will detail those sessions you have to attend).
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Date</th>
<th>Lecture</th>
<th>Laboratory</th>
<th>Assessments</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Fri: DFT</td>
<td>Introduction to the module &amp; to toxicology</td>
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<td>2</td>
<td>Thurs: MOB</td>
<td>Drug Classification</td>
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<td></td>
<td>Fri: AM</td>
<td>Liver Pathology &amp; Toxicology</td>
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<td>3</td>
<td>Thurs: MOB</td>
<td>Pharmacodynamics: agonists/antagonists, drug action at receptors</td>
<td>PBL Session 1</td>
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<td></td>
<td>Fri: RB</td>
<td>An introduction to forensic toxicology: the role of the toxicologist in court</td>
<td>Monday 2-5 pm</td>
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<td>4</td>
<td>Thurs: MOB</td>
<td>Pharmacokinetics I: absorption and distribution</td>
<td></td>
<td>Case study title due by end of Friday 24th October (by e-mail to DFT)</td>
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<td></td>
<td>Fri: MOB</td>
<td>Pharmacokinetics II: metabolism and excretion</td>
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<td>5</td>
<td>Thurs: MOB</td>
<td>Post-Mortem Toxicology and Entomotoxicology</td>
<td>PBL Session 2</td>
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<td></td>
<td>Fri: DFT</td>
<td>From Death to Detection 1</td>
<td>Monday 2-5 pm</td>
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<td>6</td>
<td>Thurs: RB</td>
<td>Murder versus Euthanasia</td>
<td>PBL Session 3</td>
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<td>Fri: DFT</td>
<td>From Death to Detection 2</td>
<td>Monday 2-5 pm</td>
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<td>7</td>
<td>Thurs: DFT</td>
<td>Legal Aspects of Forensic Toxicology 1 (Expert Witness &amp; Court)</td>
<td>Medical School Lecture and Lab. Dr. Mike Mahon</td>
<td>Monday 2-5 pm</td>
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<td>Fri: DFT</td>
<td>Legal Aspects of Forensic Toxicology 2 (Alcohol, Drugs and Driving)</td>
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<td>Liver lab pro-forma due in Friday 14th November before 5 pm (in 3rd Year FS box)</td>
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<td>8</td>
<td>Thurs: DFT</td>
<td>Classes of Poisons: Anions &amp; Corrosive Poisons</td>
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<td>Fri: DFT</td>
<td>Classes of Poisons: Pesticides</td>
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<td>9</td>
<td>Thurs: DFT</td>
<td>Classes of Poisons: Gases &amp; Volatile Substances</td>
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<td>Fri: DFT</td>
<td>Classes of Poisons: Metals</td>
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<td>10</td>
<td>Thurs: DFT</td>
<td>Classes of Poisons: Drugs</td>
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<td>Case study report due in Thursday 4th December before 5 pm (in 3rd Year FS box) <strong>AND</strong> via Turnitin link (can be found on the module web page)</td>
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<td>Fri: DFT</td>
<td>Classes of Poisons: Miscellaneous/Natural Compounds</td>
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<td>11</td>
<td>Thurs: DFT</td>
<td>Quality Assurance within the Toxicology Laboratory</td>
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<td>Fri: DFT</td>
<td>Catch up Session</td>
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<td>12</td>
<td>Thurs: MOB</td>
<td>Revision Session</td>
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<td>Fri: DFT</td>
<td>Revision Session</td>
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**Recommended Reading**

Chapter 5 - The examination of body fluids  
Chapter 7 - Forensic toxicology & drugs of abuse  
Chapter 12 - The forensic examination of human remains  
Chapter 14 – Forensic Science in Court  
Part III, Chapter 6 - An overview of drugs and pharmacology  
‘Introduction to Toxicology’, John Timbrell, CRC Press, 2002  
‘Clarke’s Analysis of Drugs and Poisons’, Moffat (ed), Pharmaceutical Press, 2003  
3rd edition, 2 volumes (Reference book)  

**OPERATION OF THE MODULE**

The first lecture slot is devoted to describing the operation of the module and an introduction and historical overview of the subject. Subsequent lectures will deal with selected topics within the Forensic Toxicology field. Some of these will feed into the practical exercises. The web-site is an important resource for students on this module:

[www.students.keele.ac.uk](http://www.students.keele.ac.uk)

This site hosts:

- Module handbook; reading list; lecture notes (PPT & pdf), weblinks, assessment details and options, past papers.

**ASSESSMENT**

You need to achieve an overall mark of 40% to pass this module.

The assessment of this module has two main components:

An **end-of-module examination** based on long answer questions. This comprises 70% of the assessment.

A **laboratory/coursework mark** is derived from a liver laboratory proforma exercise (5%) and written report on a forensic toxicology case study (25%).

**STUDENT FEEDBACK**

We welcome informal feedback and suggestions from all students during the semester. You can also feed your comments back to us through your student representatives (Stars) at the Student-Staff-Liaison Committee (SSLC) meetings. Towards the end of the module, you will be asked to complete a **short questionnaire** giving your views of the module delivery. This is an important factor in informing our future development of this module and your considered views are greatly appreciated by the staff.