

# **Marks and Traces**

EAC\_5\_137

Faculty of Engineering, Science and the Built Environment.

Session 2011/2012

Level 5

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# 1. MODULE DETAILS

Module Title:	Marks and Traces	
Module Level:	5	
Module Reference Number:	EAC_5_137	
Credit Value:	30	
Student Study Hours:	300	
Contact Hours:	156	
Private Study Hours:	144	
Pre-requisite Learning (If applicable):	Core Skills for Forensic Scientists; Core Science	
	for Forensic Scientists	
Co-requisite Modules (If applicable):	None	
Course(s):	BSc (Hons) Forensic Science; BSc (Hons)	
	Forensic Science with Criminology; BSc(Hons)	
	Forensic Science with Law; BSc(Hons) Forensic	
	Science with Psychology	
Year and Semester	Year 2011/12, Semester 1 & Semester 2	
Module Coordinator:	Hannah Willson	
MC Contact Details (Tel, Email, Room)	Telephone: 0207 815 7946	
• • • • •	Room: M308	
	Email: willsonh@lsbu.ac.uk	
Teaching Team & Contact Details	External lecturers	
(If applicable):		
Subject Area:	Applied Science	
Summary of Assessment Method:	Unseen examination, completion of laboratory	
	notebook and expert witness statement and mock	
	courtroom exercise	

# 2. SHORT DESCRIPTION

Scenes of crime contain potent information that, if sought in a systematic, legal and scientific way, can help the investigators determine what happened, who was responsible and who was involved. Firstly, the scene must always be thoroughly evaluated. The forensic scientist / crime scene examiner must start formulating hypotheses, after a complete and systematic survey of the scene and its surroundings. These hypotheses must constantly be re-evaluated. This module will provide the students with a basic understanding of the approach and investigation of a crime scene. It will also develop the students knowledge of different types of trace evidence that may be encountered at a crime or other scene. As any object may become physical evidence during a forensic investigation, the module will provide the knowledge on how to search for, recognise, collect, package, preserve, analyse and report upon marks and trace evidence. The concepts of forensic identification, forensic individualisation, and forensic documentation will each assume a prominent role. The module consists of both lectures and laboratory practical sessions. The theory for each evidence type will be taught in the lecture sessions and then the student will be expected to carry out laboratory examinations and analysis of the relevant evidence type. The laboratory practicals are recorded using documentation similar to that used in operational forensic laboratories and the final product will be a written witness statement for a court of law, which will be used to complete a mock courtroom exercise.

# 3. AIMS OF THE MODULE

- To provide theoretical knowledge on various evidence types and their relevance in forensic science
- To develop the students core laboratory skills
- To introduce students to forensic investigative techniques used at crime scenes
- To train students in the methodology used at the scene of a crime, to hypothesise on how the crime occurred and who was present/responsible
- To develop a knowledge base of points of comparison for a range of common materials.
- To understand the methodology and processes which take place in the forensic examination of a wide range of common materials, including tool marks, footwear marks, fibres, glass, paint, documents and drugs
- To provide experience of presenting scientific evidence in a mock courtroom scenario.

# 4. LEARNING OUTCOMES

On completion of this unit, students should be able to:

### 4.1 Knowledge and Understanding

- Understand and apply the principles and practice of preservation and collection
  of evidence at crime scenes
- Illustrate an in-depth knowledge as to the characteristics of various exhibits that render them useful for forensic investigation and explain them in layman's terms in a mock courtroom setting
- Independently execute laboratory examinations on a range of evidence types, evaluating the value of this evidence in the context of the case, and prepare a witness statement for court purposes

### 4.2 Intellectual Skills

- Evaluate the impact of various evidence types on a criminal and forensic investigation
- Discuss the concepts and theory behind scene of crime investigation, analysis of evidence and other procedures commonly encountered in forensic investigations.

## 4.3 Practical Skills

- Apply and appraise a variety of instrumental methods and scientific methodologies utilised in the analysis of exhibits routinely submitted to forensic laboratories
- Adhere to good laboratory practices, anti-contamination procedures and health and safety standards
- Interpret and evaluate complex scientific evidence in a clear and concise manner

## 4.4 Transferable Skills

- Plan, prioritise and review forensic casework, according to the time and resources available and the value of the evidence recovered, in order to meet deadlines and complete assessments
- Familiarise themselves with professional procedures and reflect on the work that they produce
- Enhance team-working and effective communication skills by carrying out laboratory practical work with a partner / group and undergoing an individual mock courtroom exercise

# 5. ASSESSMENT OF THE MODULE

There are four elements to the assessment procedure for this module: a 2-hour unseent examination, a mock courtroom exercise, preparation of an expert witness statement and completion of laboratory notebook. The weighting of these elements is as follows:

Element	Description	Weighting
Examination	2 hour unseen examination	50%
	(Learning outcomes 4.1, 4.2, 4.3 & 4.4)	
	Mock courtroom exercise	20%
	(Learning outcomes 4.1, 4.2, 4.3 & 4.4)	
Coursework	Laboratory Notebook	15%
	(Learning outcomes 4.1, 4.3 & 4.4)	
	Witness statement	15%
	(Learning outcomes 4.1, 4.2, 4.3 & 4.4)	

#### Examination

There will be a two hour unseen written examination at the end of the semester. More information will be presented during the scheduled lectures.

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Expert witness statement and Courtroom Exercise

Students will be provided with a mock casefile containing completed examination sheets for a specific investigation. The students are expected to ensure that all of the required information is present and to fill in any missing information, where necessary. From these results, the students are required to produce a witness statement, detailing their results. This statement will then be used in a mock courtroom exercise, where the students will be questioned on the statement they have produced.

The student will hand in their completed casefile and **3** *copies* of their witness statement to the Faculty Office (T313) before 4pm on the specified submission date. All documentation will be evaluated on its adherence to the forensic documentation guidelines outlined in lectures.

Details of the submission date for the witness statement and timetabling of the courtroom exercise will be provided during lectures and on the Blackboard site.

#### Laboratory Notebook

Students will analyse all samples given to them as if they were forensic specimens and are expected to keep a detailed record of the laboratory instructions, findings and conclusions for each laboratory practical. These notes should be made contemporaneously with each laboratory practical. This will be checked regularly by staff to ensure it is up to date. <u>The laboratory books should be handed in at the end of each laboratory session for checking.</u>

University rules on submission of coursework apply: - these entail strict penalties for----For unauthorised late submissions, unless extenuating circumstances are present.

### 6. <u>FEEDBACK</u>

Feedback will normally be given to students 15 working days after the submission of an assignment.

# 7. INTRODUCTION TO STUDYING THE MODULE

### 7.1 Overview of the Main Content

The majority of forensic cases will involve transfer of evidence between two surfaces, albeit people or objects. This module concentrates on specific types of trace and impression evidence. Each lecture will be followed by a practical session to put theory into practice. Students will obtain a good understanding of a range of techniques, in

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addition to concepts such as good laboratory practice, anti-contamination procedures and health and safety issues. Typical areas covered are investigation of a crime scene and evidence recovery, fingerprint analysis and marks and traces.

### 7.2 Overview of Types of Classes

<u>Lectures</u> – The material on this module will be presented through lectures<u>on</u> <u>Wednesday mornings</u>, discussions and case reports. Lectures will be delivered by our in-house academic staff but will also be complemented by the attendance of forensic professionals.

**Laboratory Work** – The laboratory practicals are designed to introduce students into the laboratory practices employed in forensic laboratories. Students are expected to work through the laboratory sessions using the manual provided and with the support of supervisory staff. A lab notebook should be completed which will include an outline of the examinations carried out and any results obtained.

### 7.3 Importance of Student Self-Managed Learning Time

You are expected to achieve deep learning by carrying out background reading using the given reading list as a guide and ensuring that this reading includes articles from journals and newspapers in addition to the core textbooks.

### 7.4 Employability

This module will provide students with an understanding of a range of skills employed by both forensic scientists in working forensic laboratories and scientists in other analytical fields. Students will develop the ability to carry out analytical techniques on several types of evidence routinely encountered in forensic laboratories, in addition to evaluating the significance of their scientific findings and enabling them to relay these to a court of law by providing written and oral testimony. Students will be expected to adhere to good laboratory practice and keep clear notes on all experimentation performed, an invaluable skill required for all scientific work.

# 8. <u>THE PROGRAMME OF TEACHING, LEARNING</u> <u>AND ASSESSMENT</u>

The programme of classes below is intended **only as a guide and is subject to modification** according to rate of progress and unforeseen factors.

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#### Lecture Programme

Lecture 1: Introduction to the unit

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	Introduction to crime scene investigation
Lecture 2:	Crime scene processing
Lecture 3:	Note-taking and Report writing
Lecture 4:	Marks and Impressions (Dr Sarah Jacob – FSS)
Lecture 5:	Documents
Lecture <u>6</u> 5:	History of Fingerprints and Theory of Comparison (Ron Cook - DABS)
Lecture 76:	Chemical treatments used in fingerprint examination (Dr Steve Bleay,
	HOSDB)
Lecture 87:	Fibres
Lecture 98:	Paint and Glass (Dr Sarah Jacob – FSS)
Lecture 109:	Drugs in Forensic Science
Lecture 1 <u>1</u> 0:	Forensic Analysis of Common Drugs of Abuse
Lecture 124:	Crack, smack, speed and weed (Dr Mike Griffin)
Lecture 13:	Expert witness
Lecture 12:	Revision ??
-Lecture 143:	Mock courtroom sessions Revision

### ATTENDANCE

Students are required to attend all lectures and a record of attendance will be maintained by the lecturer involved. Unauthorised non-attendance may lead to disciplinary action. All announcements pertaining to the lectures, coursework, external visits and examinations will be made in scheduled lectures or via the Blackboard site.

#### Laboratory Programme

#### Scene Investigation

• Examination of a mock crime scene

#### Laboratory 1: Footwear Marks

- Enhancement of footwear marks using various techniques
- Examination of item for assessed case

### Laboratory 2: Tool marks

- Casting of questioned marks and preparation of test marks
- Comparison of marks

#### Laboratory 3: Document examination

• Examination of an altered document using oblique lighting and ESDA

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• Ink analysis using Thin Layer Chromatography (TLC)

### Laboratory 4: Fingerprints 1

- Fingerprint examination for first level detail using inked fingerprints
- Enhancement of fingerprints using powders
- Fingerprint comparison exercise

### Laboratory 5: Fingerprints 2

• Enhancement of fingerprints using various chemical treatments

### Laboratory 6: Fibres

- Taping of items for fibres examination
- Preparation of control slides and identification of fibres
- Comparison microscopy and Microspectrophotometry

#### Laboratory 7: Glass

• Glass classification and reconstruction

#### Laboratory 8: Paint

### ATTENDANCE

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Students are required to attend all laboratory sessions until they have completed their weekly task. The student will be expected to sign into and out of the laboratory. Unauthorised non-attendance may lead to disciplinary action.

# 9. STUDENT EVALUATION

This module is running for the first time this year therefore we have no student feedback to report at this time. Students will be given the opportunity to evaluate this unit at the end of the year.

# 10. LEARNING RESOURCES

### 10.1 Core Materials

- > Jackson, ARW & Jackson, JM. (2008) Forensic Science. Pearson Prentice Hall
- Saferstein R. (2005). Criminalistics: An Introduction to Forensic Science. 8<sup>th</sup> Edition. Prentice Hall.
- > Langford, A et al. (2005) Practical Skills in Forensic Science. Pearson Prentice Hall

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Robertson J. & Grieve M. (1999). Forensic Examination of Fibres. London: Taylor & Francis.	
→Bell S (2006) Forensic Chemistry Pearson Publishing	
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10.2 Optional Materials	
Siegel J.A., Saukko P.J. & Knupfer G.C. (2000). Encyclopedia of Forensic Sciences. London: Academic Press.	
Fisher B.A.S (2000) <b>Techniques of Crime Scene Investigation</b> . 6 <sup>th</sup> Ed, CRC Press	Formatted: Font: Bold
King, L.A. (2003) The Misuse of Drugs Act: a guide for forensic scientists. Royal Society	Formatted: Font: Bold
of Chemistry.	
NOTES	
Relevant journals:	
Forensic Science International can be viewed over the internet (via the LISA journal finder web	
page) and includes many papers relevant to this unit.	
Science and Justice is available in the library and via Science Direct and older editions can be	
consulted in the British Library if you are a member.	
Students are expected to regularly browse both of the above journals to keep up to date on current research developments.	
On-line materials	
The Forensic Science Society: <a href="http://www.forensic-science-society.org.uk/home">http://www.forensic-science-society.org.uk/home</a>	
The Forensic Science Service: http://www.forensic.gov.uk/	
American Academy of Forensic Sciences: http://www.aafs.org/	
American Society of Questioned Document Examiners: http://www.asqde.org/	