



Unit Guide

Forensic Indicators

Unit SFO-2-153

Faculty of Engineering,
Science and the Built
Environment.

Session 2009/2010

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1. UNIT DETAILS

Unit Title:	Forensic Indicators
Unit Level:	2
Unit Reference Number:	SFO-2-153
Credit Value:	1
Student Study Hours:	102
Contact Hours:	48
Course(s):	BSc Forensic Science
Year and Semester	S2 2007
Unit Coordinator:	Sophie Park
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Teaching Team & Contact Details (If applicable):	
Subject Area:	SAS1
Summary of Assessment Method:	Unseen Examination (50%) Coursework (50%)

2. SHORT DESCRIPTION

It is important for any forensic scientist or crime scene examiner, to have knowledge and training on the 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 unit will provide the knowledge on how to search for, recognise, collect, package, preserve, analyse and report upon the major types of trace evidence. The concepts of forensic identification, forensic individualisation, and forensic documentation will each assume a prominent role in this unit.

3. AIMS OF THE UNIT

- 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.
- To develop the basic analytical skills necessary for forensic identification.

4. LEARNING OUTCOMES

4.1 Knowledge and Understanding

On completion of this unit you should be able to:

- Outline and explain the typical evidence types encountered in case involving some of the main types of trace evidence commonly encountered in forensic case work.
- Illustrate an in-depth knowledge as to the characteristics of various exhibits that render them useful for forensic investigation.
- Explain the some of the instrumental methods utilised in the analysis of exhibits routinely submitted to forensic laboratories.
- Critically evaluate the impact of various evidence types on a criminal and forensic investigation.
- Plan and review forensic casework according to the value of evidence recovered.
- Evaluate the value of the evidence in the context of the case and independently carry out laboratory examinations on a range of evidence types.
- Prepare a witness statement for court purposes.

4.2 Intellectual Skills

The unit will provide opportunities for you to develop a range of skills including:

Forensic knowledge – A grasp of the concepts and theory behind forensic science is essential to enable development into a competent forensic practitioner. This unit offers development of the concepts and theories behind evidence and procedures commonly encountered in forensic investigations.

Understanding of methodologies – You will develop your ability to evaluate a range of scientific methodologies routinely employed in forensic laboratories.

Ability in critical analysis – You will develop your appreciation of how evidence can be presented and challenged and your ability to critically analyse techniques and evidential laboratory findings.

4.3 Practical Skills

Practical skills – You will learn how to analyse various evidence types and record your findings employing anti-contamination procedures that are essential in forensic science. You will practice interpretation and evaluation of evidence and will become accustomed to good laboratory practices and health and safety.

Communication skills – You will develop the ability to present and explain complex scientific evidence in a clear and concise manner and to negotiate and work in groups effectively.

Use of IT – You will develop your ability to access and evaluate information available over the internet and increase your experience in using word processing packages.

4.4 Transferable Skills

Organisational skills – You will learn to plan and prioritise your work according to the time and resources available.

Team working skills – You will develop your ability to work in a team and communicate effectively by carrying out laboratory practical work with a partner and carrying out group tasks.

5. ASSESSMENT OF THE UNIT

There are two components to the assessment procedure for this unit, an examination component and a coursework component. Both components must be passed to achieve an overall pass in the unit. The exam component is split into three sections and the weighting of all the elements is as follows:

Element	Description	Weighting
Coursework	Laboratory Analysis	20%
	Laboratory Test	20%
	Group Presentations	10%
Examination	2 Hour Unseen Examination	50%

Laboratory Analysis

Each student will be given specific exhibits to analyse as they see fit. They will be assessed on the examinations they carry out and recording of these examinations and results. Full laboratory documentation must be provided by each student in the form of a case file. The student is also expected to complete a witness statement in relation to their scientific findings.

The submission date for this work is to be no later than 4pm on Monday 26th April 2010.

Laboratory Book

Students are expected to keep a detailed record of the laboratory instructions, findings and witness statements for each laboratory practical. These notes should be made contemporaneously with each laboratory practical. This will be analysed as the coursework element and will be checked regularly by staff to ensure it is up to date. **The laboratory books should be handed in no later than 4pm on Friday 12th March 2010.**

Laboratory Test

There will be a one hour laboratory test, which will include the completion of a case file. This will take place towards the end of the semester. The provisional dates for this assessment are as follows:

- **Group 1 – Monday 8th March 2010 starting at 11am.**
- **Group 2 – Monday 15th March 2010 starting at 11am.**

6. FEEDBACK

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

7. INTRODUCTION TO STUDYING THE UNIT

7.1 Overview of the Main Content

Laboratory Analysis – The laboratory practicals are designed to introduce students into the laboratory practices employed in forensic laboratories. Students will obtain a good understanding of a range of techniques, in addition to concepts such as good laboratory practice, anti-contamination procedures and health and safety issues. Typical areas covered are types of trace evidence, evidence recovery, body fluid analysis, hairs and fibres, fingerprint analysis and marks and traces.

Trace Evidence Lectures – The majority of forensic cases will involve transfer of evidence between two surfaces, albeit people or objects. This evidence is often so small that it is not readily visible to the naked eye. This evidence is essential to forensic investigations and is an important part of forensic science

7.2 Overview of Types of Classes

Lectures – Most of the material on forensic indicators will be presented through lectures, discussions and case reports. Lectures will be delivered by our in-house academic staff but will also be complimented by the attendance of forensic professionals such as document and fingerprint specialists.

Laboratory Work – You are expected to work through the lab work using the manual provided and the support of supervisory staff. A daily lab book should be completed which will include an outline of the examinations carried out and any results obtained. In addition to this, witness statements should be prepared as outlined in the lab guide.

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 unit will provide you with an understanding of a range of skills employed by forensic scientists in working forensic laboratories. You will develop your ability to carry out analytical techniques on several types of evidence types routinely encountered in forensic laboratories, in addition to evaluating the significance of your scientific findings and enabling you to relay these to a court of law by providing written testimony.

8. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

Weekly Laboratory Programme

Week 1: Footwear Marks

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

Week 2: Fingerprints

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

Week 3: Blood

- Examination of items for the presence of blood
- Classifications of blood patterns

Week 4: Hairs and Fibres

- Examination of a range of hair types (human and animal) using microscopy
- Examination of a range of fibre types using microscopy
- Preparation of control slides

Week 5: Documents Examination

- Examination for indentations using ESDA
- Ink analysis using Thin Layer Chromatography (TLC)

ATTENDANCE

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.

Weekly Lecture Programme

Week 1:	Marks and Impressions (Dr Sarah Jacob – FSS)
Week 2:	History of Fingerprints and Theory of Comparison (Ron Cook - DABS)
Week 3:	Blood Analysis (Sophie Park)
Week 4:	Hairs and Fibres (Sophie Park)
Week 5:	Paint and Glass (Dr Sarah Jacob – FSS)
Week 6:	Saliva and Semen Analysis (Sophie Park)
Week 7:	Bayes' Theorem and Statement Writing
Week 8:	DNA and the National DNA Database
Week 9:	Field Trip
Week 10:	Presentations
Week 11:	Case Studies
Week 12:	Bank Holiday
Week 13:	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.

9. LEARNING RESOURCES

9.1 Core Materials

Blood Pattern Analysis

- Wonder A. (2001). **Blood Dynamics**. London: Academic Press.
- Bevel T & Gardner R. (2002). **Bloodstain Pattern Analysis: With an Introduction to Crime Scene Management**. Boca Raton: CRC Press.

DNA Profiling

- Butler J.M. (2001). **Forensic DNA Typing**. London: Academic Press.
- Krawczak M & Schmidtke J. (1998). **DNA Fingerprinting**. *2nd Edition*. London: Bios.
- Rudin N. (2001). **An Introduction to Forensic DNA Analysis**. London: CRC Press.
- Buckleton J. (2005). **Forensic DNA Evidence Interpretation**. Boca Raton: CRC Press.
- Evett I.W. & Weir B.S. (1998). **Interpreting DNA Evidence**. Sinauer.

Criminalistics

- DeForest P. (1983) **Forensic Science, An Introduction to Criminalistics**. USA: McGraw-Hill.
- Saferstein R. (2005). **Criminalistics: An Introduction to Forensic Science**. *8th Edition*. Prentice Hall.
- Robertson J. & Grieve M. (1999). **Forensic Examination of Fibres**. London: Taylor & Francis.
- Ogle R. & Fox M. (1999). **Atlas of Human Hair Microscopic Characteristics**. Boca Raton: CRC Press.

9.2 Optional Materials

- Siegel J.A., Saukko P.J. & Knupfer G.C. (2000). **Encyclopedia of Forensic Sciences**. London: Academic Press.

9.3 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 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.

NOTES

On-line materials

- The Forensic Science Society: <http://www.demon.co.uk/forensic/>
- 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/>