Helston Forensics

Forensic Ballistic Laboratories

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Ballistic Incident Reconstruction and Analysis Course (5 Days)

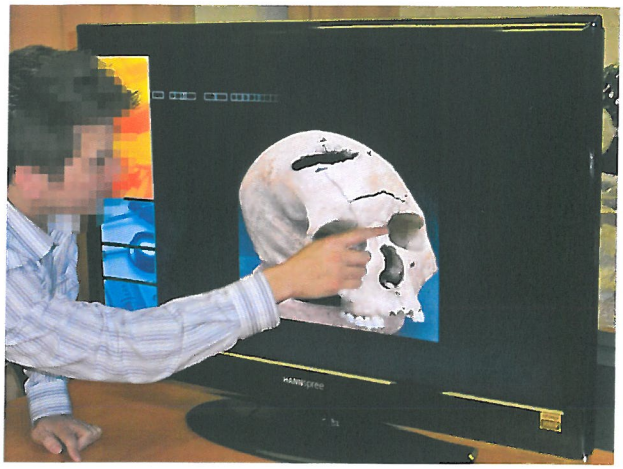
This course is designed to assist the student in his/her approach to incident reconstruction and analysis, after successful completion of the course the scientist is able to attend a scene with confidence and the ability to recognise the need and be able to record and retrieve evidence crucial to enable an accurate analysis of the incident.
The student will require a basic understanding of laboratory practises, firearms ballistics, (internal, external and terminal) and evidence recovery procedures.

- **Forensic Radiography**
- **Ballistic Wound Characteristics**
- **Trigonometry**
- **Evidence Types**
- **Rules of Evidence**
- **Expert Opinion**
- **Stated Cases**
- **Scientific Method**
- **Alternative Hypotheses**
- **Note Taking**
- **Report Writing**
- **Test Fire Procedures**
- **Ballistic Theory**
- **Ballistic Trajectory**
- **Ballistic Mathematics**
- **Reconstruction Methodology**
- **Ballistic Theodolite Principles**
- **Scaled Plan Drawing**
- **Range Determination**
- **Pattern Interpretation**
- **Ballistic Chemistry**
- **Blood Spatter Analysis**
- **GSR**
- **Richet Characteristics**
- **Ejection Pattern**
- **Ballistic Equipment**

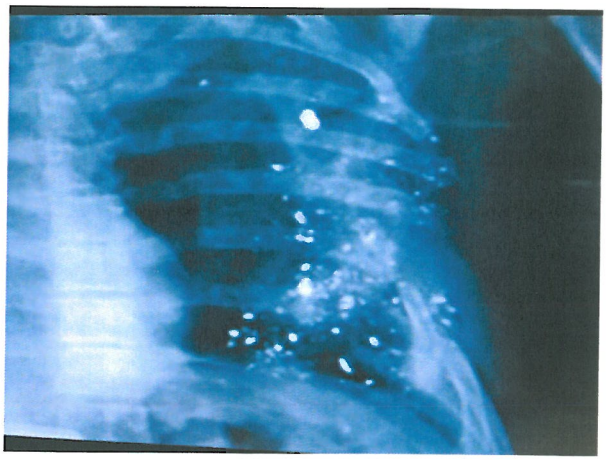
Practical scenes are constructed to incorporate the above disciplines.
The course is structured around student's participation, with considerable 'hands on' exercises.
Prohibited weapons will not be used on this course and any 'man firing' requirements are undertaken by Helston Forensic staff only.

All forensic instructors are subject matter experts (SME's) who are occupationally competent and currently employed in their field of expertise.

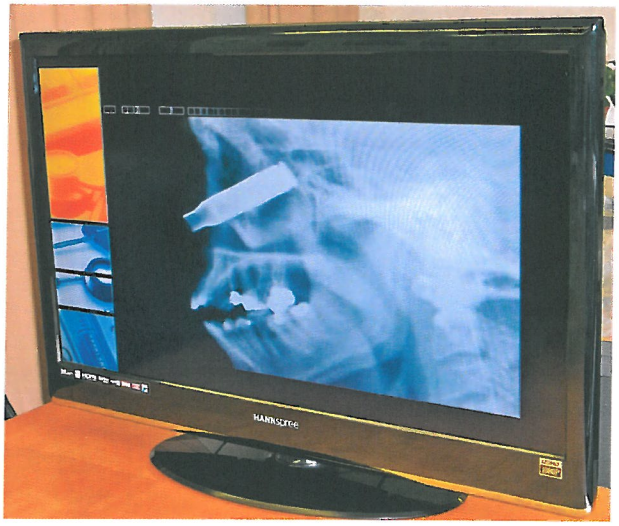
The pictures shown below cover just a few of the disciplines taught on this course, particular emphasis is taken to explain the need for the 3 tier approach when preparing scenes to allow for each method to be checked against the others to confirm accurate results.



Gun shot and impact wounds explained by a forensic radiographer, detailing the sequence of events.

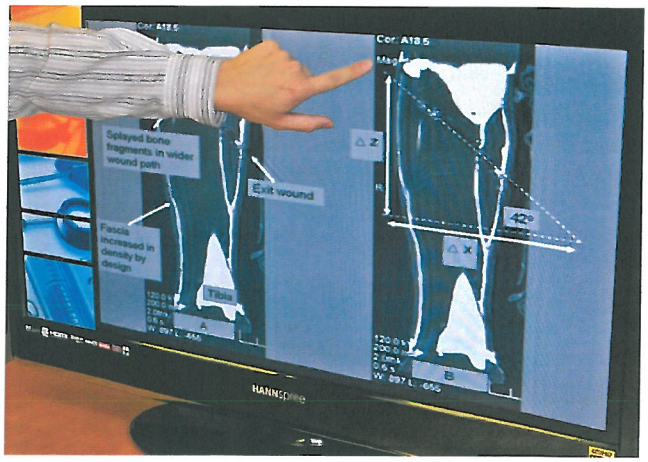


Gun shot, bone fragment and debris, the information from this x-ray explained in detail by the forensic radiographer.

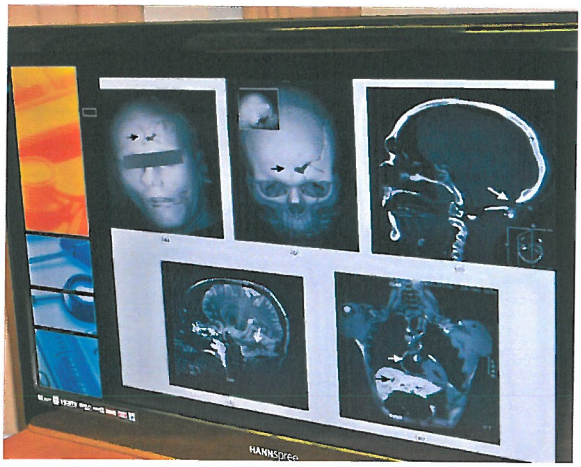


An unusual injury showing a rifle cartridge case embedded in the eye socket, an in depth knowledge of the incident scene will assist in determining the sequence of events.

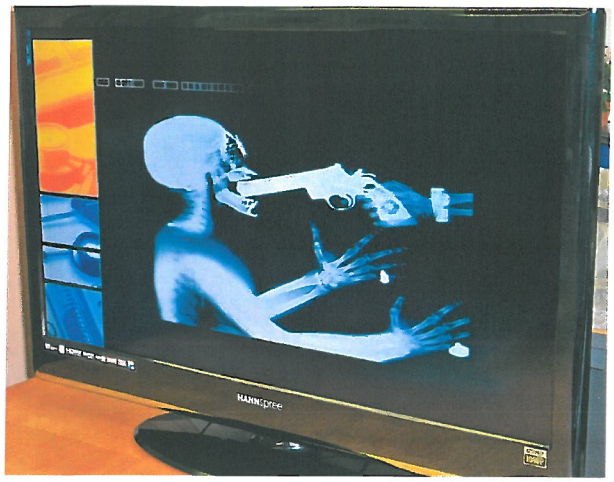
Gun shot damage, the forensic radiographer describes the damage to the hand and explains why amputation was the only option.



Wound track determination is not always calculated by the entry and the exit wounds, the x-ray can contribute to understanding this area of investigation.



How images of sections of the skull can assist in the understanding of the damage a projectile can cause, analyses of impact can be crucial in determining how a scene is interpreted.



Occasionally the Forensic Radiographer has the time to demonstrate his artistic skills, and the ability of the equipment at his disposal.

A range of chemicals are used to conduct presumptive tests, it is important to understand the correct chemical processes.

Presumptive tests to confirm heavy metals require the correct chemicals carefully mixed and applied.

Ballistic trigonometry explained, the student is tested when the scaled plan drawing of the scene is prepared. Trigonometry is the basis for trajectory reconstruction.

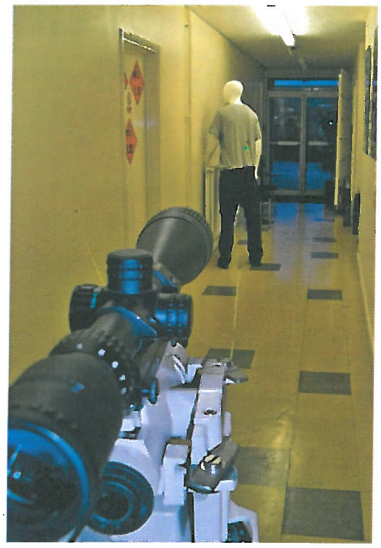
Dithiooxamide test shows positive for copper, it is essential all tests are conducted in order to ensure no destruction of evidence.

Reverse modified grease test for non-porous materials, the picture shows the 'lift' taken from the sample deposits on a wood post.

Measuring distance and angles correctly is essential.

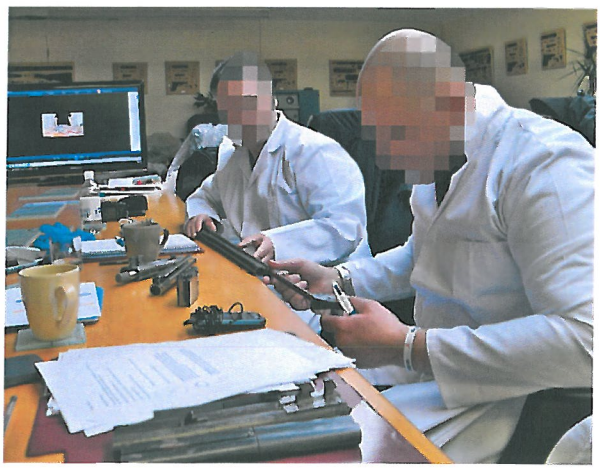
When applying chemicals the correct protective clothing is essential. Controls before and after the test are part of the process to ensure accuracy.

Zeroing the Ballistic theodolite is essential; the zoom telescopic sight is used to align the laser pointer, angles of trajectory in both planes are required to produce an accurate scaled plan drawing.



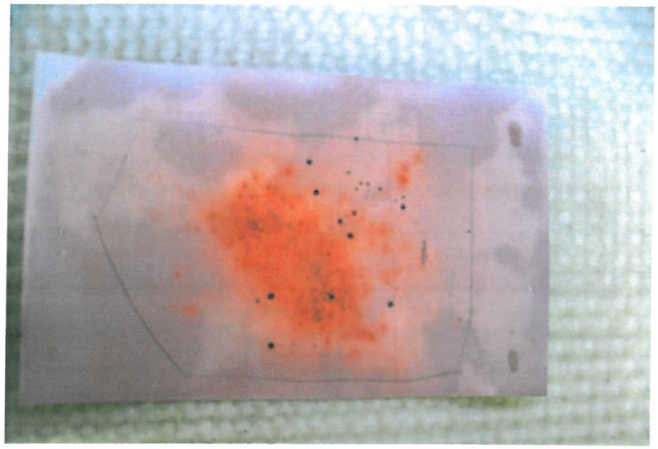
Distances and angles are accurately recorded.

Accurate notes taken at the scene allow for scaled diagrams to be produced back at the laboratory.



Shot gun barrel dimensions are taken to accurately record the correct choke dimensions, prior to pattern testing with a range of ammunition types.

Dipping the nitride free material in acid solution, used to lift nitrides from the suspect clothing.



Modified grease test showing nitrites and evidence of un burnt propellant (nitrates).

An accurate interpretation of results is essential, as is peer checking during each step of the process.

Preparing to take a lift from a porous material.

Calibrated scales used to indicate spread of organic deposits will assist in range determination.

Heat is applied to produce a chemical reaction producing results that require accurate interpretations.