Basic Bloodstain Pattern Analysis Course

Class Schedule

**Purpose:** A course of instruction designed for investigators, crime scene technicians, forensic technicians, and others involved in criminal and medical-legal investigations and crime scene analysis. The course is intended to develop a fundamental knowledge of the discipline of bloodstain pattern analysis. The course will illustrate to the student basic principals of bloodstain pattern analysis and the practical application of the discipline to actual casework. The course syllabus is not intended to create an “instant” expert.

**General Course Objectives.** Upon completion of the course the student should:

- Demonstrate knowledge of the development, history and advancement of bloodstain pattern analysis.
- Define the inherent limitations of bloodstain pattern analysis as a forensic discipline.
- Identify key bloodstain patterns using a taxonomic classification system and understand the mechanism by which they are created.
- Determine impact angles and area of origin for spatter patterns.
- Describe proper protective measures to follow in a bloodstained scene.
- Describe and demonstrate methods of documenting bloodstain scenes, both photographically and in written format.
- Demonstrate an ability to evaluate a basic bloodstain pattern scene.

**Day 1**

0800-1000  **Introduction.** Discussion of course objectives, pre-test and a discussion on the history of bloodstain pattern analysis.

Lecture Objective(s):
Demonstrate knowledge of the development, history and advancement of bloodstain pattern analysis.

1000 - 1100  **Utilization of Bloodstain Pattern Analysis in Investigations.** An overview discussion of how bloodstain pattern analysis assists the investigative process. This includes a lecture on a BPA methodology.

Lecture Objective(s):
Define the inherent limitations of bloodstain pattern analysis. Understand how bloodstain pattern analysis aids the investigative process and what steps one follows to conduct a BPA analysis.
1100-1400  **Taxonomy and Terminology Lecture.** Lecture to orient students with current accepted terminology using slides of stains to support specific terms. Outline a taxonomic classification system and application of a decision map for classifying bloodstain patterns.

Lecture Objective(s):
- Recognize basic patterns based on articulated characteristics and demonstrate an understanding of bloodstain pattern vocabulary

1400-1530  **Dynamics Lecture.** Lecture on blood droplet dynamics in flight and on impact. Providing the student with an understanding of the medium of blood and how physical laws affect blood.

Lecture Objective(s):
- Understand the physical forces acting to disrupt and disperse a blood mass into a blood stain or pattern.

1530-1630  **Documentation Lecture.** Lecture on the process of documenting bloodstain patterns, specifically outlining the "Roadmapping" method. Discussion of personal protective measures in a crime scene.

Lecture Objective(s):
- Demonstrate proper technique of documenting bloodstain pattern evidence.
- Demonstrate proper protective measures in a bloodstained scene.

**Day 2**  
*Pre-read Chapters 1-3 of the lab manual.*

0800-0900  **Determining Directionality Lecture.** Lecture on establishing basic motion as defined by the stain.

Lecture Objective(s):
- Describe and explain the characteristics that define motion in stains and patterns.

0900-1530  **Experiments 1, 2, 3, 8, 10, 11**

1 - Stain Shape as a Function of Impact Angle
2 - Diameter of a Stain as a Function of Distance Fallen and Surface Area
3 - Cast Off Stains
8 - Transfer Patterns in Blood
10 - Determining Directionality in Blood Trails
11 - Contact v. Spatter
Learning Objective(s):
Identify key bloodstain patterns and understand the mechanism by which they are created.

1530-1600  **Daily Recap**

**Day 3**  *Pre-read Chapter 5 of the lab manual. Bring scientific calculators and measuring devices to class if you have them.*

0800-0900  **Impact Angle Calculations.** Lecture on defining angle of impact.

Lecture Objective(s):
Identify well formed stains.
Describe what portions of a stain are included in the length and width measurement.
Describe the basic formulas used to define impact angle.

0900-1000  **Impact Angle Group Practical.** Small groups work with prepared stains to learn how to find the major and minor axis, measure the stain properly and utilize the impact angle formula.

Learning Objective(s):
Determine impact angles for individual bloodstains within a margin of error no less than 5-7 degrees.
Recognize why stains impacting above 70 degrees interject a level of uncertainty to the analysis.

1000-1130  **Determining Area of Origin Lecture.** Lecture on area of origin determinations using various methods (e.g. Tangent formula, stringing, graphing). Paper practical used to demonstrate graphing.

Learning Objective(s):
Demonstrate the ability to apply Area of Origin formulas to effectively define area of origin for a spatter pattern using the graph method.
Recognize inherent limitations in area of origin calculations.
Recognize the differences between area of origin calculations conducted on vertical and horizontal surfaces.

1300-1400  **Area of Origin Practical.** Individual practical in which the students using a lab manual practical, establish the area of origin.

Learning Objective(s):
Demonstrate the ability to apply Area of Origin formula to effectively define area of origin for a spatter pattern using the tangent method.
1400-1530 **Area of Origin Practical.** Student groups of four and five establish area of origin determinations on large acetate stain patterns.

    Learning Objective(s):
    Demonstrate the ability to apply Area of Origin concepts using the stringing method.

1530-1630 **Tracks, Strings, Backtrack Win Demonstrations.** Demos of various forensic software packages and their function in assisting the investigator.

    Learning Objective(s):
    Recognize the purpose and benefit of applying computer technology in bloodstain pattern analysis.

**Day 4**

0800-1600 **Experiments 4, 5, 6, 7, 9.**

    4 – Impact Spatter (Blunt Force
    5 - Impact Spatter (Gunshot/Explosive Force)
    6 - Projected Blood
    7 - Splashed Blood
    9 - Skeletonization and Drying Time of Blood
    12 - Road-mapping Practical

    Learning Objective(s):
    Identify key bloodstain patterns and understand the mechanism by which they are created.

1600-1700 **Presenting Bloodstain Evidence in Court.** Discussion on developing qualifying questions for court and general considerations when testifying as an expert.

    Lecture Objective(s):
    Understand issues related to presenting bloodstain evidence in a judicial setting.
    Demonstrate the ability to write functional voir dire qualification questions.

**Day 5**

0800-1400 **Mock Scenes.** Groups evaluate mock scenes and establish, based on all information known, a reconstruction of the events related to
the scene. Each group then walks the other groups through their scene and provides an explanation on their conclusions.

Learning Objective(s):
Identify key bloodstain patterns.
Demonstrate an ability to evaluate a basic bloodstain pattern scene.

1400-1500  **Final examination.**
1500-1600  **Diploma presentations and closing remarks.**