

## Course Syllabus

### **FORS 404/804** **Bloodstains as Evidence** 1 credit

#### **Course Description:**

The purpose of this course is to develop a basic knowledge of the science and art of bloodstain pattern analysis. This includes documentation and interpretation of geometric bloodstains, calculating probable origins, and collecting blood as a source of DNA evidence. The course requires reading assigned materials, research, creating and documenting bloodstains, basic understanding of DNA, and interpretation of bloodstain patterns. A basic understanding of the Scientific Method as a research scheme is a basic part of the course protocol. The course is an online course. Students will take quizzes and tests online, submit lab assignments via online processes, and participate in online discussions. The course follows the recommended requirements for a basic in bloodstain pattern analysis as recommended by The International Association of Bloodstain Pattern Analysts, The International Association for Identification, and the Scientific Working Group on Bloodstain Pattern Analysis: Guidelines for the Minimum Educational and Training Requirements for Bloodstain Pattern Analysts (SWIGSTAIN).

#### **Measurable Behavioral Objectives:**

Following the completion of this course, participants will be able to:

1. Demonstrate knowledge of the history and development of bloodstain pattern analysis.
2. Discuss an acceptable peer review protocol for processing a crime scene for bloodstain evidence.
3. Demonstrate the limitations and applications of bloodstain pattern analysis.
4. Identify specific bloodstain patterns and the mechanisms for creation of the patterns.
5. Execute the appropriate methods for documenting bloodstains.
6. Perform mathematical operations to determine angles of impact and areas of origin of bloodstains.
7. Perform computer enhancements techniques to aid in visualization and interpretation of bloodstains.
8. Demonstrate ability to analyze a bloodstain scene.
9. Recognize safety measures that apply to blood shed scenes.

#### **Course Materials**

- A textbook is not required for this course. If students want to purchase a textbook, the following are recommended:

Bevel, Tom and Ross M. Gardner. Bloodstain Pattern Analysis with an Introduction to Crime Scene Reconstruction. 3<sup>rd</sup> ed. Boca Raton, FL: CRC Press, 2008.

James, Stuart, Paul E. Kish, and T. Paulette Sutton. Principles of Bloodstain Pattern Analysis: Theory and Practice. Boca Raton, FL: CRC Press, 2005.

Wonder, Anita. Bloodstain Pattern Evidence: Objective Approaches and Case Application. Burlington, MA: Elsevier, Inc., 2007.

- Computer with Internet access is required. It is recommended that a DSL or cable connection be available to the student. Your computer needs to be able to read Microsoft Office Word, Microsoft Office PowerPoint, and Microsoft Office EXCEL. You will need the capability to download digital images to a computer and send those images to me. All of the UNL computers have these capabilities.
- A scientific calculator that is capable of computing basic trigonometric functions, and calculating basic statistical functions.
- A 6" scientific scale with measurements in millimeters/centimeters and inches is required.
- A zero edge protractor is required.
- A source of blood/simulated blood. Blood may be acquired from one's person, meat from a grocery store, or a some other reliable source, as examples. Stage blood or a combination of red food coloring can be used in some cases. *\*\*Note: stage blood and/or red food coloring does not have the same properties as blood.\*\**
  - If you want to have someone mix synthetic blood for you, you can buy synthetic blood from [www.arrowheadforensics.com](http://www.arrowheadforensics.com), Item # A-1219B. It says it is not suitable for bloodstain analysis. It is not, because nothing acts like blood other than blood. You can order stage blood from Mehron. It works as well as anything. I would get the small bottle. Arterial or venous works equally well. The website for Mehron is [http://www.mehron.com/category\\_s/114.htm](http://www.mehron.com/category_s/114.htm).
- Digital Camera capable of at least 3 megapixel files is required. Cell phone cameras will not work. Make sure your digital camera comes with a cable for downloading digital images.
- Equipment for making blood patterns is required: eyedropper, white paper, protective gloves, hammer, mouse trap, simulated hair, knife, baseball bat or large stick, shoe, sponge.

### Assignments

Assignment	Total Points Possible
Quiz: 4 @ 25 points each	100
Final Exam	100
Bloodstain project: 4 @ 25 points each	100
Crime Scene Reconstruction Paper	100
Discussion Board	50
Error rate paper (graduate students only)	100
	<b>450 (undergrad), (550 graduate)</b>

### Grading Scale

	%		%		%		%		%
A+	97-100	B+	87-89	C+	77-79	D+	67-69	F	≤ 59
A	93-96	B	83-86	C	73-76	D	63-66		

A-	90-92	B-	80-82	C-	70-72	D-	60-62		
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### **Expectations for graduate students**

Graduate students are held to a higher standard of quality, completeness, and analysis. For the Crime Scene Reconstruction Paper graduate students will be held to a much higher level of quality such as clarity of writing, literature review and depth of writing, logical reasoning, and spelling and grammar. Discussion Board postings are also held to a higher level of quality. In addition, graduate students are responsible for one extra assignment: a paper on error rates.

However, lab assignments and quizzes will be graded with the same expectations, regardless of graduate or undergraduate standing.

### **Topics and Class Schedule**

#### *Topics*

1. History of Bloodstain Pattern Analysis, Blood As Evidence Protocols, Error and Limitations of Bloodstain Pattern Analysis, Crime Scene Reconstruction, Critical Thinking, The Scientific Method.
2. Drip/Drop Patterns, Calculating Angles of Impact, Forensic Digital Imaging, Written Documentation.
3. Cast Off Patterns
4. Swipe, Wipe, Contact, and Impression Patterns.
5. Volume and Impact Patterns
6. Projected Patterns, Expired Patterns, Impact Patterns, Determining Areas of Origin.
7. Artifactual Patterns.
8. Computer Enhancement of Bloodstain Patterns
9. Formulating Logical Inferences Relating to Bloodstain Patterns, Physical Evidence, and Testimony.
10. The Role of Bloodstain Pattern Analysis in Crime Scene Reconstruction
11. Research Topics In Bloodstain Pattern Analysis

#### **Week 1: Quiz 1 and First Project due by midnight at the end of Week 1**

Assignment: Please go to Blackboard, “Discussion Board,” and respond to the first posting.

#### Readings:

1. <http://www.bloodspatter.com/BPATutorial.htm>. Go to this website and review the information. This is an overview and introduction to bloodstain pattern analysis. We will be covering each of these categories.
2. PowerPoint Lectures (Blackboard > Course Documents > PowerPoint Lectures)
  - a. Overview, History, and Safety of Bloodstain Pattern Analysis.
  - b. Critical Thinking for the Bloodstain Pattern Analyst.
  - c. Passive Stains
3. <http://science.howstuffworks.com/bloodstain-pattern-analysis.htm>. Read each section in “how stuff works”. Pay particular attention to the history section.
4. [http://en.wikipedia.org/wiki/Bloodstain\\_pattern\\_analysis](http://en.wikipedia.org/wiki/Bloodstain_pattern_analysis). Read through the Wikipedia information. The information related to bloodstain on Wikipedia is actually quite good.

5. Please read the section on “Crime Scene Safety” Forensics Science Handbook, FBI. It can be found at [www.fbi.gov](http://www.fbi.gov), under reports and publications, or at <http://www.fbi.gov/hq/lab/handbook/forensics.pdf> starting on page 147.

***Week 2: Quiz 2 and Second project due by midnight at the end of Week 2***

Readings:

1. PowerPoint Lectures
  - a. Mathematics for the Bloodstain Analyst
  - b. Transfer Stains

***Week 3: Quiz 3 and Third Project due by midnight at the end of Week 3***

Readings:

1. PowerPoint Lectures
  - a. Projected Patterns
  - b. Impact Patterns
  - c. Origin Determinations

***Week 4: Quiz 4, and Crime Scene Reconstruction Paper due by midnight at the end of Week 4***

Readings:

1. PowerPoint Lectures
  - a. A Primer on Bloodstain Photography
  - b. Computer Enhancement for the Bloodstain Pattern Analyst
  - c. Crime Scene Reconstruction

***Week 5: Final Exam, Error Rates Paper and Fourth Project due by midnight at the end of Week 5***

Readings:

1. PowerPoint Lecture
  - a. Miscellaneous Bloodstains
  - b. Report Writing
  - c. Final Test Review
  - d. Pattern Recognition

**Academic and Personal Requirements**

Statement on Academic Integrity: Academic integrity is one of the basic principles of a university community. The University of Nebraska encourages and expects the highest standards of academic honesty from all students. The Student Code of Conduct states that “cheating, plagiarism, or other forms of academic dishonesty” are subject to disciplinary action. Refer to the Student Code of Conduct for additional information.

Discrimination of any form, as described by University of Nebraska will subject any person in violation to disciplinary action.

Course materials include graphic photographs and descriptions. These materials are to be treated as privileged information. The photographs are of persons who have died or who have been seriously injured as a result of violence. Respect for the victims of violent crime and their families are expected of all participants. The photographs and descriptions are for educational and research purposes. They should never be made available for public consumption, or entertainment purposes.

### **The University of Nebraska's Commitment to Students with Disabilities**

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

### **Additional References**

- Bevel, T & Gardner, R.M. (2008) Bloodstain Pattern Analysis With An Introduction To Crime Scene Reconstruction, 3<sup>rd</sup> ed. Boca Raton: CRC Press.
- Lee, H. & Palmbach, T & Miller, M. (2001) Henry Lee's Crime Scene Handbook. New York: Academic Press.
- James, S. H. & Eckert, W.G. (1999) Interpretation of Bloodstain Evidence at Crime Scenes. Boca Raton: CRC Press.
- James, S. & Kish, P. & Sutton, T. (2005). Principles of Bloodstain Pattern Analysis. Boca Raton: CRC Press.
- James, S. & Kish, P. & Sutton, T. (2003) Recognition of Bloodstain Patterns. James, S. & Nordby, J. (Eds). Forensic Science, An Introduction to Scientific and Investigative Techniques. Boca Raton: CRC Press.
- MacDonell, H.L. (1993) Bloodstain Patterns. Corning, New York: Laboratory Of Forensic Science.
- Van Stratton, M. (2002) Examination Of Bloodstained Clothing. Peoria, Illinois: Unpublished Manuscript Presented At Mid-States Educational Conference.
- Wonder, A.Y. (2002) Blood Dynamics. New York: Academic Press.