

Spectrum Program Session 1

Course Title: Forensic Science Honors

Course Description

The word “forensic” comes from the Latin word meaning “before the forum.” Forensic Science Honors examines the application of science to the criminal justice system. Utilizing lecture and laboratory, students collect, preserve, and analyze crime scene evidence in a hands-on experience, learning scientific methods, procedures and techniques. Labs may include trace analysis of hair, fiber, stain, epithelial cells, fingerprints, and DNA. This class is an excellent prelude to future science and laboratory coursework.

Students will learn and practice the techniques and skills of documents analysis, latent fingerprint development analysis, principals of drug chemistry, physical match, blood pattern analysis, as well as the principals and limits of the most modern DNA work used in forensic science today. Students will perform experiments to acquire personal knowledge in the same way true forensic experts do. Then they will apply their knowledge to compare evidence from a crime scene to evidence taken from suspects.

Throughout the course, the students will meticulously work crime scenes from the mapping and collecting of evidence to the final lab comparison analysis, report writing, and court testimony.

Essential Questions

- How does science uncover the truth in criminal investigations?
- How can new forensic science discoveries be balanced with right to privacy issues?

Course Outcomes

Students will learn and practice many of the scientific and investigative techniques used by today’s law enforcement. By the end of this course, students will have an understanding of the real roles of police officers, detectives, crime scene technicians, medical examiners, crime lab analysts, and be able to do the following:

- Think critically when examining evidence
- Apply earth, life, physical science, and mathematics to crime scene investigation
- Collaborate with peers and share ideas
- Collect and process evidence from a crime scene
- Devise experiments to re-create crime scenes and test theories
- Write reports and form accurate conclusions based on comparisons & investigations
- Articulate the necessary steps leading to a logical conclusion
- Conduct all investigations with integrity

Instructional Strategies

Strategies will include pre-assessments to determine individual learning needs; flexible grouping and collaboration; compacting curriculum; inquiry learning; individual research and presentations; and class discussions. Activities will include documenting and evaluating evidence and working mock crime scenes. Students will also do small group and individual research and present their findings to the class.

Resources and Materials

Textbook/course pack

Students will read a variety of news and professional articles on real criminal cases, and use a packet of lessons, activities, and articles created by Mr. Adams as well as readings and activities taken from:

- Walker, P., Wood, E., (1998) *Crime Scene Investigations*. Jossey-Bass. ISBN-10: 9780787966300
- McGurk, M., (2006) *Forensic Science: An Activity Based Guide to Crime Investigation*. TPS. ISBN-10: 1847000010
- Saferstein, R. (2008) *Forensic Science: An Introduction*. Prentice Hall. ISBN-13: 1961411

Materials

- Scientific Calculator (Graphing Calculator is not required)
- 3-ring binders with loose-leaf paper (recommended), or standard notebook
- Pocket folder for holding handouts, etc.
- A Change of old clothes, and long pants and shoes (No sandals, or open-toed shoes) for work in the chemistry lab.
- Digital camera with computer interface and tripod, (Not required, but recommended)

Web sites

- FBI <http://www.fbi.gov/about-us/lab>
- American Academy of Forensic Sciences <http://www.aafs.org/>
- Midwest Association of Forensic Scientists <http://www.mafs.net/index.php?id=links>

Other Media

- The instructor will provide a variety of journal articles from other academic and professional sources. Students will also access journal article databases to perform individual research.
- The class will incorporate a number of videos for student analysis.

Student Assessment

Pre-Assessment

The Pre-assessment will be similar to the final comprehensive exam to determine the student's background knowledge.

CTD Grading Scale

A+	100-97%	A	96-93%	A-	92-90%
B+	89-87%	B	86-83%	B-	82-80%
C+	79-77%	C	76-73%	C-	72-70%
D+	69-67%	D	66-63%	D-	62-60%
F	below 60%				

Breakdown of Final Grade

- Homework (10%) - Homework is assigned to assess student understanding of reading assignments.
- Tests (10% each) - Students will take 2 tests in addition to the exam to assess understanding and application of the material presented in the course.
- Labs and Crime Scene Reports (30%) - Students will be assessed on the quality and care of their labs and reports in addition to their conclusions.
- Special Project (30%) - Students will pick a forensic topic to present to the class. The presentation must demonstrate deeper understanding of the forensic discipline and include a case as an example to demonstrate how that forensic discipline was a key factor in convicting a perpetrator. Students are encouraged to use creativity and perform their own experiments if practical.
- Final Exam (20%) - The final insures the main points of the course were understood.

Post-Assessment

Students will complete a comprehensive final exam to evaluate their understanding of material discussed throughout the course.

Schedule

Date	Topic(s)	In-class Activities	Assignments/Assessments
Day 1 Mon 6/27	<i>Forensic Science Intro</i> <ul style="list-style-type: none"> • What is the Best Evidence? • Deductive Reasoning • Roles of the PO, Det, ET, ME, SA, and DA <p>LAB: (outside)</p> <ul style="list-style-type: none"> • CS Processing Intro • Footprints Casts • Photography Practice 	<ul style="list-style-type: none"> • Class Expectations • Getting to Know You • Deadly Picnic Activity • Video: <i>CSI</i> fact or fiction (Arson) • CS photo practice 	Forensic Science Pre-test Deadly Picnic Worksheet Homework: Read <i>The Crime Scene</i> and answer reading questions Read <i>Footprints</i> & answer questions
Day 2 Tue 6/28	<i>Crime Scene Processing</i> <ul style="list-style-type: none"> • Chain of custody • Evidence handling • CS processing debrief • Special Projects Intro <p>LAB: (outside) CS Processing & Photo Practice continued</p>	<ul style="list-style-type: none"> • The many disciplines of Forensic Science • Debrief CS photos • Centobie Jigsaw Timeline activity to develop teamwork • CS processing practice • What can go wrong? 	Homework: Read <i>Fingerprints</i> and answer reading questions Choose a special project topic – the project is due on 7/8 and will be returned on 7/11 for revision
Day 3 Wed 6/29	<i>Latent Fingerprints</i> <ul style="list-style-type: none"> • Principals of FP Classification & Identification • Lifts • Visualization <p>LAB: (Chemistry lab)</p> <ul style="list-style-type: none"> • Super Glue fuming • Ninhydrin • Silver Nitrate • Iodine Fuming • Wet Powder • ALS 	<ul style="list-style-type: none"> • <i>Fingerprinting</i> suspects • FP classification • Dusting for latent prints & lifts • <i>John Orr</i> case • Read & discuss article • Integrity in FS 	AFIS activity Homework: Read <i>Documents Examination</i> up to page 567 and answer questions
Day 4 Thurs 6/30	<i>Fingerprint Comparisons</i> <ul style="list-style-type: none"> • More on Minutiae • AFIS • Twins <p><i>Documents</i></p> <ul style="list-style-type: none"> • Handwriting • Type, photocopies • Obliterations • Indented • Ransom notes • Statement analysis 	<ul style="list-style-type: none"> • FP comparisons • AFIS • Winnetka FP Case • Mayfield case reflection • Forgery activity • Ransom Note activity and discussion • Review for Test #1 	Homework: Practice Test on Crime Scene and Fingerprints Finish Statement Analysis Questions

Date	Topic(s)	In-class Activities	Assignments/Assessments
Day 5 Fri 7/1	<i>Investigative data bases</i> <ul style="list-style-type: none"> NCIC AFISS CODIS LEADS NIBIN <i>Documents continued</i> <ul style="list-style-type: none"> HW Comparison Ink comparison LAB: (Chemistry lab) Ink chromatography analysis	Test #1 on CS and Fingerprints Field Trip Evanston Police Dept. <ul style="list-style-type: none"> Forgery activity <i>continued</i> 	EPD Thank you notes Homework: Finish reading <i>Documents Examination</i> and answer questions Work on Special Projects
Day 6 Mon 7/4	<i>Blood pattern analysis</i> <ul style="list-style-type: none"> CS Reconstruction AOI Point of Origin Transfer patterns LAB: (outside) CS reconstruction with blood spatter analysis	<ul style="list-style-type: none"> Dropping Blood to acquire personal knowledge of blood patterns Using math to determine AOI and Point of Origin 	Homework: Read <i>Blood pattern analysis</i> and answer questions
Day 7 Tues 7/5	<i>Blood pattern analysis continued</i> LAB: (outside) CS construction	<ul style="list-style-type: none"> Video: Mark Winger case Preparing set for CS re-creation 	Blood patterns measurements for point of origin Homework:
Day 8 Wed 7/6	<i>CS Processing Practical</i> LAB: (outside) CSI practical	<ul style="list-style-type: none"> Complete CS Documentation Evidence search Photographs Collection Bloodspatter Analysis 	CS reconstruction Lab practical Homework: Read <i>DNA analysis</i> & answer questions
Day 9 Thurs 7/7	<i>CS Debriefing</i> <ul style="list-style-type: none"> Chain of Custody review Paperwork review and report writing Lab: (chemistry lab) FP evidence processing & comparison	Review for Test #2 <ul style="list-style-type: none"> Final comparisons and reports from crime scene Mockup displays for court 	Homework: Read <i>DNA</i> to page 323 Practice Test Review Radio Show script
Day10 Fri 7/8	<i>Science Friday Radio Show</i> <i>DNA evidence</i> <ul style="list-style-type: none"> DNA Replication PCR Tandem Repeats RFLP STRs 	Test #2 on Documents, and Bloodspatter Analysis <ul style="list-style-type: none"> NPR radio show recreation DNA simulation activity DNA jigsaw activity Electrophoresis 	Homework: Finish <i>DNA</i> Chapter and answer reading questions
Day11 Mon 7/11	<i>DNA evidence</i> <ul style="list-style-type: none"> Mitochondrial DNA Contamination Lab: (Computer lab) Project revisions	<ul style="list-style-type: none"> Jane Mixer case OJ case DNA review game 	Homework: Read <i>Firearms</i> and answer reading questions Revise special projects

Date	Topic(s)	In-class Activities	Assignments/Assessments
Day12 Tues 7/12	<i>Firearms & Tool Mark Examination</i> <i>Arson</i> Lab: (outside) Arson CS	<ul style="list-style-type: none"> • Firearms • Ammunition • Tool marks • Video: FA & Tool marks <ul style="list-style-type: none"> • Arson evidence 	Homework: Finish Special Projects
Day13 Wed 7/13	<i>Court Testimony</i> <ul style="list-style-type: none"> • Expert Witness • Defense • Mock trial <i>Special project presentations</i>	<ul style="list-style-type: none"> • Video: Expert Witness • Students are assigned different roles in trial • Mock Trial Debrief • Individual Special Project Presentations w/peer review 	Homework: Practice Test for Final
Day14 Thurs 7/14	Review for Final <i>Special project presentations continued</i>	<ul style="list-style-type: none"> • Review Jeopardy Game • Individual Special Project Presentations w/peer review 	Homework: Study w/Review check list for test
Day15 Fri 7/15	9:00 am – 11:30 am Final Exam 1:00 pm – 5:00 pm Parent/Teacher Conferences		ENJOY THE REST OF YOUR SUMMER!

Schedule is subject to change depending on availability of extra resources and student interests.

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.