Course Description

In this course, you will learn many of the cardinal principles and techniques of crime scene investigation. The necessity of a rigorous scientific approach will be stressed. Students will be introduced to:

- Documentation with notes, sketches, and photography
- Specialized techniques for the recognition and enhancement of physical evidence
- Preparation and maintenance of case folders for records including notes, sketches, photographs, and contacts/communications
- Communication of results and preparation formal, typewritten reports
- Management of scenes and available resources including equipment and personnel
- Ethics and bias in crime scene investigation and criminalistics

The primary aim of the course is to introduce students to scientific philosophy, integrity, scene investigation procedures, criminalistics, and the role of the criminalist in scene investigations.

Required Textbook


Supplemental Textbooks


Additional Reading

Additional reading assignments are required. Refer to the bibliography for these assignments and other recommended readings. At the discretion of the instructor, readings not listed in the bibliography may also be assigned.
## Course Calendar

<table>
<thead>
<tr>
<th>Wk</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Assigned Reading* (see page 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>AUG 22</td>
<td>Introduction, origin of evidence, CSI &amp; criminalistics, and scenes as recording media</td>
<td>Ogle (ch. 1, 3, 4); Inman &amp; Rudin (Origin of Evidence); De Forest (CSI); Ristenbatt (documentation files)</td>
</tr>
<tr>
<td>02</td>
<td>AUG 29</td>
<td>Crime scene management, quality issues, and search techniques; Evidence collection and packaging</td>
<td>Ogle (ch. 2); Ogle (ch. 12, Appendix IV)</td>
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<tr>
<td>03</td>
<td>SEP 05</td>
<td>Labor Day — NO LECTURE</td>
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<tr>
<td>04</td>
<td>SEP 12</td>
<td><strong>QUIZ</strong> — Science, pseudoscience, scientific method, integrity, ethics, and bias</td>
<td>Ogle (ch. 14); Codes of Ethics/Conduct (AAFS, ABC, ASCLD, CAC)</td>
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<tr>
<td>05</td>
<td>SEP 19</td>
<td>Non-destructive enhancement and documentation techniques</td>
<td>NFSTC (CSI: A Guide for Law Enforcement)</td>
</tr>
<tr>
<td>06</td>
<td>SEP 26</td>
<td>Firearms (basic knowledge, preliminary examination, and gunshot residue)</td>
<td>Ogle (ch. 8)</td>
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<tr>
<td>07</td>
<td>OCT 03</td>
<td>Pattern evidence (fingerprints, footwear, tires, etc.)</td>
<td>Ogle (ch. 5, 9); US DOJ NIJ (Fingerprint Sourcebook (ch. 2, 7, 8, 10))</td>
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<tr>
<td>08</td>
<td>OCT 09</td>
<td><strong>MIDTERM EXAMINATION #1</strong></td>
<td></td>
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<tr>
<td>09</td>
<td>OCT 17</td>
<td>Trace evidence (hair, fibers, glass, paint, soil, etc.)</td>
<td>Ogle (ch. 6); SWGMAT references (×2); SWGTREAD references (×6)</td>
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<tr>
<td>10</td>
<td>OCT 24</td>
<td>Biological evidence (blood, semen, saliva, etc.); Entomological considerations</td>
<td>Ogle (ch. 7, Appendix VI); Biological Evidence Preservation Handbook (p. 9-24)</td>
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<tr>
<td>11</td>
<td>OCT 31</td>
<td>Fires and explosions; Digital and electronic evidence</td>
<td>TWGFEX (Fire and Arson Scene Evidence); US DOJ NIJ (Electronic CSI (p. 1-22))</td>
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<td>12</td>
<td>NOV 07</td>
<td><strong>MIDTERM EXAMINATION #2</strong></td>
<td>Ogle (ch. 10-11, Appendix V)</td>
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<tr>
<td>13</td>
<td>NOV 14</td>
<td>Sexual assault, questioned documents; Drugs and alcohol</td>
<td>Ogle (Appendices I-II); Ristenbatt (communication file)</td>
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<tr>
<td>14</td>
<td>NOV 21</td>
<td><strong>THANKSGIVING RECESS — NO LECTURE</strong></td>
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<tr>
<td>15</td>
<td>NOV 28</td>
<td>Communication of results</td>
<td>Ogle (ch. 15); National Research Council (NRC) report (p. 177-179)</td>
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<tr>
<td>16</td>
<td>DEC 05</td>
<td>Crime scene/incident reconstruction; Additional crime scene considerations</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>DEC 12-16</td>
<td><strong>FINAL EXAMINATION (date/time TBA)</strong></td>
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</tbody>
</table>

* Reading Assignments should be completed by date indicated; e.g., Ogle (chapter 1), Inman and Rudin, De Forest, and Ristenbatt should be read before class meeting on 22-AUG-2015.
Assigned Reading

American Board of Criminalistics (ABC). *Rules of Professional Conduct*.
California Association of Criminalists (CAC). *Code of Ethics*.


Ristenbatt 3rd, RR. *Communication of results: reports, testimony, and release of preliminary information*.
Ristenbatt 3rd, RR. *Documentation: notes, sketches, and measurements*.
Ristenbatt 3rd, RR. *Preservation of scene record (documentation)*.


Assessment of Knowledge and Skills

<table>
<thead>
<tr>
<th>ASSESSMENT METHOD</th>
<th>ASSIGNMENT WEIGHT</th>
<th>FINAL WEIGHT</th>
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</thead>
<tbody>
<tr>
<td>Problem Sets (×4)</td>
<td>6.00%</td>
<td>24.00%</td>
</tr>
<tr>
<td>Ethics exercise/discussion</td>
<td>3.00%</td>
<td>3.00%</td>
</tr>
<tr>
<td>Quiz</td>
<td>4.00%</td>
<td>4.00%</td>
</tr>
<tr>
<td>Midterm Examinations (×2)</td>
<td>26.00%</td>
<td>52.00%</td>
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<tr>
<td>Final Examination</td>
<td>17.00%</td>
<td>17.00%</td>
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<tr>
<td>TOTAL COURSE SCORE</td>
<td>100.00%</td>
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</table>

Additional Grading Concerns

- **Late Submission of Assignments**
  - 10% deduction/day (0000-2359 hr past due date & time) — maximum deduction = 100%
  - Extensions will be granted for exigent circumstances (documentation may be requested!)

- **Attendance Policy**: Students are expected to attend every lecture and laboratory session (refer to University Faculty Senate Policy 42-27: Class Attendance for further information). Recurrent attendance issues will result in deductions from the final course score.
  - Two (2) unexcused absences: 10% deduction
  - Three (3) unexcused absences: 25% deduction
  - Four (4) unexcused absences: 40% deduction
  - **NOTE**: Two (2) late arrivals equal one (1) unexcused absence

Grading Scale

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93.00 ≤ x ≤ 100.0</td>
</tr>
<tr>
<td>A–</td>
<td>90.00 ≤ x &lt; 93.00</td>
</tr>
<tr>
<td>B+</td>
<td>87.00 ≤ x &lt; 90.00</td>
</tr>
<tr>
<td>B</td>
<td>83.00 ≤ x &lt; 87.00</td>
</tr>
<tr>
<td>B–</td>
<td>80.00 ≤ x &lt; 83.00</td>
</tr>
<tr>
<td>C+</td>
<td>77.00 ≤ x &lt; 80.00</td>
</tr>
<tr>
<td>C</td>
<td>70.00 ≤ x &lt; 77.00</td>
</tr>
<tr>
<td>D</td>
<td>60.00 ≤ x &lt; 70.00</td>
</tr>
<tr>
<td>F</td>
<td>x &lt; 60.00</td>
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</table>
ACADEMIC INTEGRITY

All Penn State policies regarding ethics and honorable behavior apply to this course and each student must abide by the Academic Integrity policies set forth by the University Faculty Senate (Policy 49-20: Academic Integrity) and the Eberly College of Science. It is your responsibility to be thoroughly familiar with all policies and sanctions. They can be accessed at:

http://www.psu.edu/ufs/policies/
http://www.science.psu.edu/academic/integrity/Policy.html

Discussion of course concepts and cooperative study are encouraged; however, collaboration, discussion, assistance, cheating, plagiarism, etc., are NOT permitted during examinations or other assignments when specified by the instructor. This, and other unethical or dishonest behavior, will result in failure of the exam or assignment and may lead to failure of the course and University disciplinary action. Integrity and ethics are considered exceptionally important by the instructor.

CODE OF MUTUAL RESPECT

The Eberly College of Science Code of Mutual Respect and Cooperation embodies the values that we hope our faculty, staff, and students possess and will endorse to make The Eberly College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.


DISABILITY POLICY

Penn State welcomes students with disabilities into the University’s educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at +1-814-863-1807 (V/TTY). For further information regarding ODS, please visit the Office for Disability Services Web site at http://equity.psu.edu/ods/.

In order to receive consideration for course accommodations, you must contact ODS and provide documentation (see the documentation guidelines at http://equity.psu.edu/ods/guidelines/documentation-guidelines). If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.
Bibliography


WORLD WIDE WEB (WWW) RESOURCES

- American Board of Criminalistics (ABC)
- California Association of Criminalists (CAC)
- Ethics Resource Center
- Markkula Center for Applied Ethics
- Public Responsibility in Research and Medicine
- Penn State Rock Ethics Institute
- American Academy of Forensic Sciences (AAFS)
- International Association for Identification (IAI)
- National Reference Center for Bioethics Literature
- AAAS Professional Ethics Report
- Office of Research Integrity: US Dept. HHS
- National Whistleblowers Center
## Course Objectives

### OBJECTIVES

### STRATEGIES AND ASSESSMENT

#### Comprehension of the techniques used to preserve the crime scene record (notes, sketches, and digital SLR photography).

- Lectures illustrating handwritten recording techniques and appropriate content
- Lectures and reading assignments covering fundamentals of photography and application to scene and evidence documentation
- Written examination questions to assess fundamental knowledge

#### Comprehension of the techniques used to recognize, enhance, document, collect, handle, and package physical evidence. Comprehension of importance of chain of custody and evidence integrity.

- Lectures outlining various search, recognition, enhancement, collection, handling, and packaging techniques
- Lectures illustrating science behind enhancement techniques
- Lectures discussing importance of chain of custody and evidence integrity
- Written examination questions to assess fundamental knowledge

#### Comprehension of common field tests for the presumptive identification and enhancement of different types of physical evidence.

- Lectures outlining common field tests for the presumptive identification and/or enhancement of biological evidence, fibers, gunshot residue, and impression evidence
- Lectures illustrating science behind field tests and enhancement techniques
- Written examination questions to assess fundamental knowledge

#### Comprehension of incident/crime reconstruction including basic bloodstain pattern analysis and projectile trajectory analysis.

- Lectures describing fundamentals of a scientific reconstruction
- Lectures illustrating science behind techniques including basic bloodstain pattern analysis and projectile trajectory analysis
- Written examination questions to assess fundamental knowledge

#### Comprehension of proper preparation and maintenance of case folders.

- Lectures describing fundamentals of documentation and use of forms and logs
- Written examination questions to assess fundamental knowledge

#### Comprehension of techniques to communicate results including verbal and written communication.

- Lectures describing communication of results; verbal and written
- Written examination questions to assess fundamental knowledge

#### Comprehension of scene management techniques including allocation of personnel, resources, and time.

- Lectures illustrating aspects of scene management including allocation of personnel, resources, and available time (if time constraints)
- Students will be required to supervise at least one mock crime scene to demonstrate ability to manage personnel (classmates), available equipment, and time

#### Comprehension of importance of science and scientific, objective, critical thought processes in scene investigations.

- Lectures discussing science, scientific integrity, critical thinking and their importance during the investigation of a scene
- Written examination questions designed to assess critical thinking and problem-solving abilities

#### Comprehension of the role and impact of the criminalist in incident scene investigations.

- Lectures discussing role (responsibilities and duties) and importance of the criminalist in a scene investigation
- Written examination questions to assess fundamental knowledge

#### Introduction to codes of professional conduct and ethics for various forensic science professional organizations; comprehension of necessity of ethics in forensic science and potential ethical problems in forensic science including issues of professional practice, technical competence, and bias.

- Lecture discussing integrity, ethics, and bias in forensic science
- Reading ethical codes from various forensic science organizations
- Reading assignments that examine professional issues in forensic science including problems such as bias, professional practice, and technical competence
- Class discussion of reading assignments
- Discussion of 7-step approach to evaluation of ethical issues
- Discussion of case study using 7-step approach to evaluation of ethical issues
Q & A

Frequently asked questions (FAQ’s)

Why is science important in forensic science and criminalistics?

Virtually any individual can be trained to perform routine laboratory and field work. Thorough comprehension of the underlying scientific knowledge differentiates a criminalist (scientist) from a technician or investigator. Written examinations and problem sets are designed to assess critical thought processes and fundamental knowledge.

Will there be a “curve” at the end of the course?

NO! However, if the class mean (final score) is less than 75.00%, a constant may be added to every student’s final score. This possibility, and its magnitude, will remain unknown until after all methods of assessment have been received and graded at the end of the semester.

How stringent is the course attendance policy? Why is attendance monitored?

Very! Attendance will be taken within the first five (5) minutes of the lecture. It is the student’s responsibility to inform the instructor in advance of any session that will be missed due to predictable circumstances. In the event of an unexpected emergency, inform the instructor ASAP.

The course is intensive. Excessive absences from lectures will negatively influence the ability to complete required assignments and will ultimately hinder comprehension of the subject matter.

What is the instructor’s philosophy regarding this course?

The instructor believes that students must accept more responsibility in their education. When individuals are forced to solve problems on their own, critical thought processes are promoted and the educational process is enhanced. Students will be expected to:

• Remain attentive during lectures
• Utilize information from FRNSC 210 and locate additional information, if needed
• Be self-reliant, inquisitive, and enthusiastic
• Recall basic scientific and mathematical knowledge

Students are cautioned against seeking guidance from classmates; all important questions should be directed to the instructor without hesitation. Students are strongly encouraged to verify procedures and proper equipment usage with the instructor prior to use.

Can the instructor offer additional advice?

• Take this course seriously! It is an intense, challenging experience that requires considerable effort.
• Be familiar with basic concepts of algebra, geometry, general chemistry, general physics, and basic statistics. Written examinations will include questions that are designed to assess your ability to solve problems using many of the aforementioned concepts.
• Complete each problem set and discuss all difficulties with the instructor.
• Complete the required reading assignments by the specified dates.
• Keep abreast of the material and avoid “cramming” for examinations. Procrastination may produce obstructions along the path toward the achievement of a desirable grade.
• Select an extra credit project early and complete the assignment before its deadline.
• If you are experiencing any problems during the semester, contact the instructor immediately. Delay will likely lead to undesirable and possibly irreversible circumstances.
Projects

1. Photographically document the exterior of a darkened building (e.g., large house) or transport vehicle (e.g., tractor-trailer/semi-trailer truck) during evening and/or early morning hours (2100 to 0400 hr). A large interior space, e.g., gymnasium or auditorium, may also be photographed. **Subject must be dark with little to no ambient light.** All perspectives (eight views = 4 sides & 4 corners) of subject must be recorded using EACH technique described below.
   - Ambient light (short exposures, i.e., < 10 seconds)
   - Ambient light (long exposures, i.e., > 25 seconds)
   - Electronic flash unit (on-camera or remote cord)
   - Electronic flash unit (on-camera or remote cord) AND several off-camera electronic flash units (“slaves”)
   - “Painting with light” using a portable, handheld light source

2. Preparation of a wall surface (≈ 4 feet height by 6 feet length) to contain patterns created with dilute blood (≈ 1/1000 in water). Patterns should include a hand impression and other contact patterns. Additionally, a pattern of spattered whole blood should be deposited, allowed to dry, and subsequently removed with common cleaning tools (sponges, etc.) until no apparent traces remain. Photographs of the wall must be obtained prior to luminol treatment. Luminol will be applied to the wall and the resultant luminescence captured photographically. Documentation must illustrate before and after luminol application. At least one photograph should contain the visible luminescence and the wall illuminated in white light to illustrate the location of the luminescent areas.

3. Construct an episcopic coaxial illuminator and obtain: 1) an examination quality, 1:1 photograph of a latent fingerprint on a mirrored or highly polished, reflective surface; and, 2) an examination quality photograph of a latent footwear impression in dust on a floor or other polished, nonporous surface. Photographs before (without) and after (with) the illuminator must be obtained for each.

4. Use of polarizing filters for contrast enhancement. Two scenarios must be created and documented:
   - Preparation of a pattern of fine blood droplet stains (< 1 mm diameter) on black fabric with a satin finish (nylon, polyester, etc.). Bloodstains must be barely visible to unaided eye. Document “evidence” with and without polarizing filters. Manipulate the filters to obtain optimal contrast prior to documentation.
   - Create another low contrast scenario, which can be resolved with the use of polarizing filters. Document “evidence” with and without polarizing filters. Manipulate filters to obtain optimum contrast prior to photographic documentation.

5. Create two different low contrast scenarios such that the “evidence” and background surfaces are complementary colors. Background surfaces must be patterned and the “evidence” must be difficult to visualize. Photograph “evidence” without filters. Photograph “evidence” using a variety of color contrast filters to obtain optimum contrast.

Guidelines

**DUE DATE**
- Monday, 28-NOV-2016 before 1430 hr
- Consultation with instructor BEFORE starting a project is strongly advised for additional advice and specific guidelines.
- Submission must include:
  - Final report
  - All notes, sketches, measurements, calculations, and original digital image files/photographs

**SUBMISSION OF WORK**
- All notes, measurements, calculations, sketches, and photographs must be submitted. **Detailed notes must be recorded for each project. Notes must permit replication of work.** These are photography exercises; ALL original, unaltered, digital image files must be submitted via USB drive or other method.
- Brief typewritten report of project design must be submitted. Report must include a brief introduction (statement of problem), implementation (materials & methods), results, and discussion.
  - Times or Times New Roman font (12 pt), double spaced, one (1) inch margins, and cover/title page

**ASSESSMENT**
- Technical errors (project and/or report), problems with experimental design and implementation (project), incomplete projects, substandard results (project), and errors in the report including grammar, typos, spelling, syntax, clarity, etc., will result in the imposition of deductions.

**ADDITIONAL GUIDELINES**
- All questions must be directed to the instructor. **Students may not ask FRNSC 410/415 course assistants (CA’s) or other students (past or present) for advice or assistance without permission of the instructor.** Projects will require preparation and work. They are challenging. Ensure work meets expectations of instructor. **Consultation with instructor BEFORE starting a project is strongly advised for additional advice and guidelines.**
- Students may work in pairs (teams of two) on all projects. Teams of three or more students are prohibited.
- Students/teams may NOT discuss any aspect of their work with other students (past or present), teams, or course assistants (CA’s). Collaboration is prohibited except among members of the same team.
- Cheating and other academic dishonesty will result in no credit and a significant deduction from final course score.
- If awarded, team members will receive equivalent credit.
- Only one project may be submitted per student/team. Students may not work on more than one project. Students may not work on projects they worked previously.