It is the responsibility of each student to carefully review this document. Its content is subject to revision with notice.

COURSE INFORMATION

INSTRUCTOR
Ralph R. Ristenbatt III
Office: 325C Whitmore Lab
E-mail: rrr20@psu.edu
Phone: +1-814-867-0503
Mobile/SMS: +1-610-428-9066
Office Hours: by appointment

DAY/TIME/LOCATION
Section 001
Day: Monday
Time: 1430-1730 HR
Location: 308 Boucke

CANVAS CMS
psu.instructure.com
CANVAS will be used extensively for communication and posting course material. Students are strongly advised to check CANVAS frequently for updates.

Beretta Model 92F 9 mm discharge
Image courtesy of US DOJ FBI.
REQUISITE COURSES

- Requisite course (must be taken previously or concurrently)
  - FRNSC 485 (undergraduate) or FRNSC 801 (graduate)
- Students who do not meet these prerequisites after being informed in writing by the instructor may be dis-enrolled during the first 10-day free add-drop period:
  http://www.psu.edu/dept/oue/aappm/C-5.html
- If you have not completed the listed prerequisites, promptly consult with an instructor.
  Students who re-enroll after being dis-enrolled according to this policy are in violation of Item 15 in the Student Code of Conduct:
  http://studentaffairs.psu.edu/conduct/codeofconduct/

COURSE DESCRIPTION
This course will explore the knowledge and methods relevant to the scientific reconstruction of crime. As a historical science, crime reconstruction will be compared and contrasted with experimental science and the utilization of the scientific method. Philosophical topics will include scientific inductivism and falsificationism, the two primary methods used to evaluate hypotheses, and other epistemological approaches to the pursuit of knowledge and truth. A significant portion of the course will be devoted to the knowledge and techniques necessary to identify and sequence discrete events that comprise incidents including the analysis of blood deposits, firearm evidence including ballistics, and other material and physical traces. The course will utilize lectures, classroom discussions, reading assignments, review of literature relevant to crime reconstruction, and review of cases to promote and facilitate learning.

COURSE TEXTBOOKS

- Snow CP. The two cultures and the scientific revolution. New York: Cambridge University Press; 1961.
OTHER COURSE REQUIREMENTS
Access/knowledge of CANVAS and Internet

SYLLABUS MODIFICATIONS
• Changes to this syllabus may be made as deemed appropriate by the course instructor. Students will be notified in writing/email if changes occur.
• Changes to the syllabus, class schedule, announcements, etc. will be communicated in class and/or via email. Students are REQUIRED to check their Penn State and CANVAS e-mail at least daily.

INFORMATION LITERACY
Students will recognize when research is required and will have the ability to access, analyze, integrate, and evaluate information from a variety of sources. These sources include, but are not limited to, Penn State library databases, published and other written materials, and computer sources (Internet, databases, etc.).

EXPECTED COURSE BEHAVIOR
• Students are expected to be actively involved in their acquisition of knowledge. Every student is responsible for all assigned reading, material presented in class, and computer-assisted and delivered instructional material.
• All students are expected to behave ethically and with honor and integrity (see Academic Integrity Policy).
• Behavior deemed as disruptive to the instructor or fellow students (i.e., cell phone use, texting, excessive chatting, etc.) may result in the student(s) being asked to leave. If you are asked to leave, you will be counted as absent for the entire class. If the behavior continues, the instructor has the right to ask that the student be removed from the course.
• Cell phones MUST BE SILENCED AT ALL TIMES.
• Texting during class will result in the student being asked to leave and the student will be counted as absent.

CONFIDENTIAL INFORMATION AND NON-DISCLOSURE AGREEMENT
This course will utilize photographic images, reports, and other records from real-life cases. Every student has a duty of responsibility to protect all case information and will be required to sign a non-disclosure agreement.

ATTENDANCE CONSIDERATIONS
• The instructor reserves the right to require written documentation of any event(s) leading to missed classes (funerals, hospitalization, physician’s office visit, etc.).
• If a student is absent, they will be responsible for all content that has been covered on that day. This includes lecture content, announcements, assignments, and any other material distributed to the class. The student is also responsible to be prepared for the next class.

ASSESSMENTS
• If a student misses an assessment:
  - The student must e-mail the course instructor within 24 hours of the absence with a plan for completing the missed assessment. If emergent circumstances prevent e-mail correspondence within 24 hours, the instructor must be notified as soon as possible.
  - Documentation of the event must be provided to the course instructor and a plan for completing the missed assessment must be implemented by the student.
  - If an assessment is missed, it must be completed before the next class session. If emergent circumstances prevent a make-up before the next session, the instructor must be notified as soon as possible.
  - It is the instructor’s prerogative to administer an alternative format assessment for any make-up assessment.
• Additional requirements/instructions may be given at the start of an assessment.

OTHER ASSESSMENT REQUIREMENTS
• Students are responsible for keeping a back-up copy of all submitted take-home work.
• All assignments are due on the date and time specified unless otherwise determined by the instructor (see Late Submission Policy).
• Additional requirements/instructions may be given at the time an assessment is assigned.
GOALS AND OBJECTIVES

COURSE GOALS AND OBJECTIVES

Introduce and enhance understanding of science, the scientific enterprise, logic, inference, and philosophical perspectives

Introduce and enhance understanding of historical and experimental sciences

Introduce and enhance understanding of epistemology, epistemics, and the culture of science

Introduce and enhance understanding and recognition of pseudoscience, “junk science,” and nonsense

Discuss analysis of sentinel events in criminal justice and role of criminalistics in analytical and preventative roles

Introduce and enhance understanding of traceology and the assessment/evaluation of traces

Introduce medical and forensic pathology terminology and concepts

Discuss approach to case analysis and crime reconstruction

Provide guidance and examples for case assessment and crime reconstruction
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Class Activity</th>
<th>Assessments Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2017-01-08</td>
<td>Introduction and lecture</td>
<td></td>
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<tr>
<td>2</td>
<td>2017-01-15</td>
<td><strong>NO CLASS—MARTIN LUTHER KING JR. HOLIDAY</strong></td>
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<td>3</td>
<td>2017-01-22</td>
<td><strong>NO CLASS</strong></td>
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<td>2017-01-29</td>
<td>Lecture</td>
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<td>5</td>
<td>2017-02-05</td>
<td>Group presentations</td>
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<tr>
<td>6</td>
<td>2017-02-12</td>
<td>Group presentations</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2017-02-19</td>
<td>Individual presentations</td>
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<td>8</td>
<td>2017-02-26</td>
<td>Individual presentations</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2017-03-05</td>
<td><strong>NO CLASS—SPRING RECESS</strong></td>
<td></td>
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<tr>
<td>10</td>
<td>2017-03-12</td>
<td>Case assessment exercises</td>
<td>PAPER</td>
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<td>13</td>
<td>2017-04-02</td>
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<td>TAKE-HOME EXAM</td>
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<td>14</td>
<td>2017-04-09</td>
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<td>16</td>
<td>2017-04-23</td>
<td>Group presentations</td>
<td>REPORT</td>
</tr>
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<td>17</td>
<td>2017-04-30</td>
<td><strong>FINAL EXAMINATION WEEK—NO FINAL EXAM</strong></td>
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### COURSE ASSESSMENT

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<thead>
<tr>
<th>Assessment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Take-home examination</td>
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<tr>
<td>Individual presentation</td>
<td>15%</td>
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<tr>
<td>Group presentation x2 (5% and 10% each)</td>
<td>15%</td>
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<tr>
<td>Paper</td>
<td>15%</td>
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<tr>
<td>Report (case assessment/reconstruction)</td>
<td>25%</td>
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<tr>
<td>Class participation</td>
<td>5%</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
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### Grading Scale

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<th>Letter Grade</th>
<th>Score (%)</th>
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<td>A</td>
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<tr>
<td>A-</td>
<td>$90.00 \leq x &lt; 93.00$</td>
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<tr>
<td>B+</td>
<td>$87.00 \leq x &lt; 90.00$</td>
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<tr>
<td>B</td>
<td>$83.00 \leq x &lt; 87.00$</td>
</tr>
<tr>
<td>B-</td>
<td>$80.00 \leq x &lt; 83.00$</td>
</tr>
<tr>
<td>C+</td>
<td>$77.00 \leq x &lt; 80.00$</td>
</tr>
<tr>
<td>C</td>
<td>$70.00 \leq x &lt; 77.00$</td>
</tr>
<tr>
<td>D</td>
<td>$60.00 \leq x &lt; 70.00$</td>
</tr>
<tr>
<td>F</td>
<td>$x &lt; 60.00$</td>
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**NOTE:** Grades are NOT rounded up. For example, a final course score of 59.99% will result in a failing grade.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assigned Reading</th>
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<tbody>
<tr>
<td>1</td>
<td>2017-01-08</td>
<td>Logic, inference, science, traceology, case assessment, reconstruction</td>
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<td>Aspects of forensic pathology</td>
<td>Chisum &amp; Turvey (2011)</td>
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<td></td>
<td></td>
<td>Walkthrough of case assessment/reconstruction</td>
<td>chapters 5-8, 11</td>
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<td>5</td>
<td>2017-02-05</td>
<td>Group presentations</td>
<td>Refer to BIBLIOGRAPHY — ALPHABETICAL BY TOPIC</td>
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<tr>
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<td>Forensic Science, Scientific Culture, &amp; Philosophy</td>
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<td></td>
<td>Epistemology &amp; Epistemics</td>
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<td>Historical &amp; Experimental Science</td>
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<td>Sentinel Event Analysis</td>
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<td>Group 3</td>
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<td>Criminalistics &amp; Traceology</td>
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<td>Assessment of Traces</td>
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<td>Group 4</td>
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<td>Pseudoscience &amp; Bullshit</td>
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<td>Reconstruction</td>
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<td>Pseudoscience &amp; Bullshit</td>
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<td>Advanced topics/research</td>
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<td>Advanced topics/research</td>
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<td>9</td>
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<td>Case assessment exercises</td>
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<td>13</td>
<td>2017-04-02</td>
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<td>16</td>
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<td>CASE PRESENTATIONS</td>
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<td>2017-04-30</td>
<td><strong>FINAL EXAMINATION WEEK — NO FINAL EXAM</strong></td>
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</tbody>
</table>
Articles, chapters, and other readings


**COURSE BIBLIOGRAPHY — ALPHABETICAL BY TOPIC**

**Assessment of Traces**
Hicks et al., 2015.
Lawton, 1980.
Mnookin, 2008.
White, 2015.

**Criminalistics & Traceology**
Burney & Pemberton, 2013.
Crispino et al., 2011.
De Forest, 1999.
Evett et al., 2017.
Margot, 2011.
Matulienë & Krikščiūnas, 2011.
Morelato et al., 2017.
Ribaux et al., 2015.

**Epistemology & Epistemics**
Dellsén, 2016.
Koppl et al., 2008.
Pigliucci, 2008.
Walton & Zhang, 2013.

**Forensic Science, Scientific Culture, & Philosophy**
Kuhn, 1970.
Truran, 2013.

**Historical & Experimental Science**
Cleland, 2002.
Cleland, 2011.
Cleland, 2013.
Cleland & Brindell, 2013.
Fenyvesi, 2017.
Jeffares, 2008.

**Pseudoscience & Bullshit**
Gordin, 2017.
Hansson, 2017.
Ivanković, 2016.
Morrison, 2014.
Pennycook et al., 2015.
Pigliucci, 2015.
Pigliucci & Boudry, 2014.
Wakeham, 2017.

**Reconstruction**
Chisum & Turvey, 2011.
Crispino, 2008.
Haag & Haag, 2011.
Harrison, 2006.
Morgan, 2017-I.
Morgan, 2017-II.

**Sentinel Event Analysis**
Kramarenko, 2012.
UNIVERSITY POLICIES

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.

COUNSELING AND PSYCHOLOGICAL SERVICES
Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients’ cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Counseling and Psychological Services at University Park (CAPS): +1-814-863-0395  http://studentaffairs.psu.edu/counseling/
Penn State Crisis Line (24 hours/7 days/week): +1-877-229-6400
Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

EDUCATIONAL EQUITY AND BIAS REPORTING
Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias webpage (http://equity.psu.edu/reportbias/).
**NOTABLE QUOTES**

Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as silent evidence against him. Not only his fingerprints or his footprints, but his hair, the bers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects - all these and more bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is factual evidence. Physical evidence cannot be wrong; it cannot perjure itself; it cannot be wholly absent. Only its interpretation can err. Only human failure to nd it, study and understand it, can diminish its value.

*Kirk, Paul, Crime investigation, John Wiley & Sons Canada, Limited, 1953*

I have no data yet. It is a capital mistake to theorise before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.


The palms of the hands and the soles of the feet are covered with two totally distinct classes of marks. The most conspicuous are the creases or folds of the skin which interest the followers of palmistry, but which are no more significant to others than the creases in old clothes; they show the lines of most frequent flexure, and nothing more. The least conspicuous marks, but the most numerous by far, are the so-called papillary ridges...

*Francis Galton, Finger Prints, Macmillon and Co., 1892.*

Nul ne peut agir avec l'intensité que suppose l'action criminelle sans laisser des marques multiples de son passage, tantôt le malfaiteur a laissé sur les lieux des marques de son activité, tantôt, par une action inverse, il a emporté sur son corps ou sur ses vêtements les indices de son séjour ou de son geste.

*Edmond Locard, L'enquête criminelle et les méthodes scientifiques, Flammarion, 1920.*

No one can act with the intensity of a criminal activity without leaving multiple traces of his/her action. In some instances, the criminal leaves traces of his/her activity at the scene and in some other instances, in an inverse fashion, he/she takes on his/her body or clothing, traces from the scene or from the criminal act itself. *English translation by Staufer E, Bonfanti M. Forensic investigation of stolen-recovered and other crime-related vehicles, Elsevier Science, 2006.*

**TRACEOLOGY**

**CRIME SCENE TRACES**

Upper image: single 00 Buck projectile exit in vehicle door (exterior).

Middle image: bloody footwear impressions visualized with BlueStar® Forensic.

Lower image: GSR pattern on white cotton produced from Taurus PT-99 9 mm pistol and Winchester 155 grain 9 mm aluminum-cased ammunition.

Green and red LASERS used to visualize projectile trajectories.