



Spaulding High School 2021-2022 Course Syllabus

Course Title: SCI 1315: Forensic Science

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Course Description: Forensic Science is the application of science to those criminal and civil laws that are enforced by police agencies in a criminal justice system. It involves all areas of science including biology, anatomy, chemistry, physics, and earth science with an emphasis on complex reasoning and critical thinking. Students will engage in lectures, labs, case studies, online activities, and simulations. Writing will be an important component of this class.

Parental Advisement Letter: Parents please read

Materials: Students will need to supply and bring to class daily (see me if this is a concern):

- Charged chromebook
- Notebook
- Writing Utensils

Text: This class will have an assigned textbook. Select readings may be used for reference.

Units of Study:

- Unit 01: Observations,
- Unit 02: Crime-scene Investigation and Evidence Collection
- Unit 03: Fingerprints
- Unit 04: DNA
- Unit 05: Blood and Blood Spatter
- Unit 06: Toxicology and drugs
- Unit 07: Forensic Entomology
- Unit 08: Death; Manner, Mechanism, Cause
- Unit 09: Forensic Anthropology

Learning Tasks:

- Students are expected to participate/complete all "Learning Tasks" which include: class discussions, online labs/activity, lecture/notes, projects, investigations, practice sheets, and review sessions. All Learning Tasks are NOT assessed, although feedback is routinely provided.
- At the beginning of each week I will post a **Weekly Learning Agenda** to our google classroom. This will contain the week's learning tasks. Assignments that are able to will be posted directly to the google classroom.

Assessment/Reassessment: Assessments will be used to determine if you met a standard or not.

- ***In order to take an assessment you MUST turn in the Review and any other assignment that is indicated as required before you will be given the assessment. A minimum of 80% of LT's must be completed in order to take the assessment.***
- Once an assessment has been returned, you have the opportunity to reassess for a higher grade. In order to reassess, you will need to make sure **all work** is complete in that chapter/unit. Only then will a reassessment be given.

Progress Reports: Every 3-weeks, you will receive a progress grade (Meeting, Below and Unsatisfactory). This progress grade is determined based on class work completion and current scores on assessments. If you are not meeting academic expectations (below or unsatisfactory), then you will be required to attend office hours the following day to make a plan (PAS).

Call Back Day:

At the end of the semester during Call Back Day, students who are close to passing will be allowed to make up no more than 2 performance indicators. If students did not consistently complete PAS tasks and meet PAS expectations, then they may be ineligible for Call Back.

Grading Components: Each unit will consist of a reading, vocabulary words, two/three activities/labs through which you will demonstrate content skills, a class discussion which may include a type II write, and an assessment to demonstrate comprehension of skills and content.

Optional Honors Credit:

Honors designation is centered on students striving for greater breadth and complexity into the course material, and demonstrating greater commitment and rigor in doing so. In order to achieve "Honors" status for the course, a student must:

- Complete an additional, advanced assignment for each unit/standard of the course.
- Pass all honors assignments. Each will be graded as pass/fail.
- Complete all honors assignments on the deadline required.
- Be proficient in all performance indicators.
- Turn in all assignments and assessments in a timely manner

Passing the Course: Use the [Course Performance Grading Outline](#) to determine your overall grade for the course.

Students must achieve a "Proficient" or higher in all of the standards in order to earn "Proficient" in the class, as is spelled out in the SHS Course Performance Outline. To accomplish this a student must earn "Proficient" in the majority of the performance indicators for each standard, with at least "Beginning" in the rest (no "NE"). Additionally, for a score of "Partially Proficient" students must have "Proficient" or better in a majority of standards and at least "Developing" in the rest.

To be eligible for "Exemplary" or "Partially Exemplary" (as well as "Honors") students must have "Proficient" or better in every performance indicator.

Classroom Expectations: The primary expectation in class is to maintain a respectful learning atmosphere. Below are some ideas of what this looks like:

- Speaking and acting respectfully to each other, the teacher, and guests:
 - Appropriate language and interactions
 - Active listening
 - Clear communication about any concerns
 - Appropriate use of electronics
- Respecting the space and the materials used:
 - SAFETY
 - Following directions
 - Keeping everything clean and functional (report any issues right away)
- Respecting the content
 - Keeping an open mind, trying new things
 - Being present - on time and engaged
 - Asking questions to help clarify the material

Labs and Activities:

Since the classroom is a laboratory, students need to be prepared to engage in the activities and uphold appropriate laboratory behavior any time they are in class. Students must sign and follow the Spaulding High School Laboratory Safety Contract. Effective participation in labs is essential to attaining proficiency. A breach in the lab safety contract can result in removal from the activity and potential disciplinary action.

Electronic devices will ONLY be used by teacher discretion. Use of devices could result in it being confiscated and returned at the end of class.

List of Assessed Course Standards:

Standard #1: Observations and Evidence Collection

Students will be able to Observation and investigative skills to properly collect evidence

Performance Indicators:

- 1.1 I can identify and explain problems in making appropriate observations.
- 1.2 I can describe changes that occur in the human brain during observation
- 1.3 I can distinguish between perceptions and observations, fact and opinion, inductive and deductive reasoning
- 1.4 I can distinguish between direct and circumstantial, class and individual evidence, primary and secondary crime scenes
- 1.5 I can make a paper bindle
- 1.6 I can explain the importance of and techniques of creating a valid chain of custody.

Standard #2 : Fingerprints

Students will be able to identify characteristic of fingerprints and how they're used in identifying individuals

Performance Indicators:

- 2.1 I can identify three basic types of fingerprints and at least six minutiae of fingerprints.
- 2.2 I can distinguish between plastic, latent and patent fingerprints; loop, whorl and arch, delta, core, and bridge
- 2.3 I can describe four techniques for visualizing latent fingerprints.

Standard #3: Blood and Blood Spatter

Students will understand how blood and blood spatter is used as evidence within the Forensic Community

Performance Indicators:

- 3.1 I can describe the forensic significance of different blood types.
- 3.2 I can outline the procedure used to determine blood type
- 3.3 I can describe the proper procedure for handling blood evidence.
- 3.4 I can determine the angle of impact, area of convergence and area of origin to analyse blood spatter.
- 3.5 I can compare and contrast antigens and antibodies, cast off and passive blood patterns, swipe and wipe, satellite and spine.
- 3.6 I can identify and describe how different types of blood patterns are formed .
- 3.7 I can compare and contrast the Kastle-Meyer and ELISA test for confirmation of human blood.

Standard #4 : DNA

Students will be able to understand how DNA is collected and used in identifying individuals

Performance Indicators:

- 4.1 I can explain how DNA is collected at a crime scene.
- 4.2 I can explain what short tandem repeat is and why it is important in DNA profiling.
- 4.3 I can describe how to use DNA, mtDNA ,Y STRs and how they can be used to identify members of a family.
- 4.4 I can describe how and the importance of proper processing of DNA from a crime scene.
- 4.5 I can compare and contrast genes and chromosomes , exon and intron, STRs and PCRs, restriction enzymes and restriction fragments.

Standard #5: Toxicology and Drugs

Students will be able to explain the toxicology of common drugs used in the United States.

Performance Indicators:

- 5.1 I can provide examples of drugs, toxins and poisons.
- 5.2 I can describe the role of a toxicologist in analysing substance evidence
- 5.3 I can compare and contrast presumptive and confirmatory testing .
- 5.4 I can describe how people get exposed to environmental toxins and describe their effects on the body..
- 5.5 I can distinguish between tolerance, addiction, dependence, and withdrawal.
- 5.6 I can show the relationship between law, crime and the use of drugs
- 5.7 I can relate the signs and symptoms of overdose with a specific substance or combination of substances

Standard #6 : Forensic Entomology

Students will be able to use forensic entomology to identify post mortem intervals especially if cadaver has been moved after death.

Performance Indicators:

- 6.1 I can differentiate between complete and incomplete metamorphosis, larva, pupa and maggots, entomology and forensic entomology
- 6.2 I can compare and contrast the four stages of blow fly metamorphosis and describe their significance to forensic entomology.
- 6.3 I can describe the effect of different environmental factors on insect development.
- 6.4 I can describe the five stages of decomposition.
- 6.5 I can relate the process of insect succession to changes in the environment as decomposition occurs.
- 6.6 I can explain how insect analysis is used to help identify a deceased person and their exposure to drugs, toxins, or poisons.
- 6.7 I can summarize the procedures for collecting and documenting insect evidence from a crime scene.
- 6.8 I can describe several ways forensic entomology is used to help in the solving of crimes.

Standard #7: Death: Manner, Mechanism and Cause

Students will be able to characterize death as to manner, mechanism, and cause

Performance Indicators:

- 7.1 I can distinguish between cellular death and death of an organism. .
- 7.2 I can describe the characteristic four the five manners of death; natural, accidental, suicide, homicide, and undetermined.
- 7.3 I can distinguish between the manner, cause and mechanism of death.
- 7.4 I can outline the sequence of events that occurs in the first few minutes after death.
- 7.5 I can explain how algor, rigor, and livor mortis develop following death and describe how their developments are affected by environmental factors.

- 7.6 I can sequence and describe the chemical and physical changes during decomposition properly using the terms autolysis, putrefaction, marbling, adipocere.
- 7.7 I can estimate a postmortem interval using the three mortises, stomach content, decomposition and environmental factors.
- 7.8 I can compare and contrast the role of medical examiners and coroners.
- 7.9 I can describe the procedure of an autopsy and give examples that can be used to help establish manners, mechanisms, and cause of death.

Standard #8: Forensic Anthropology

Students will be able to use forensic anthropology to derive biological profiles

Performance Indicators:

- 8.1 I can distinguish among growth plates, bone caps, bone shafts and sutures; and explain their significance for forensic anthropology.
- 8.2 I can compare and contrast an adult's skeleton and a child's skeleton in terms of composition, number of bones, suture marks and growth plates
- 8.3 I can apply knowledge of ossification to estimate the age of the deceased at the time of death based on skeletal remains.
- 8.4 I can apply appropriate formulas to estimate the height of a person based on individual bone length.
- 8.5 I can distinguish between male and female skeletal remains based on the structure, the size and shape of the skull, the pelvis, and the long bones.
- 8.6 I can provide examples of different types of skeletal trauma due to disease, injuries, occupation, or environmental factors that can provide clues to the identification of skeletal remains.
- 8.7 I can discuss the significance of isotopes in determining where someone lived.
- 8.8 I can describe the methods of radiology, computer imaging, DNA technology, video or photographic superimposition, and craniofacial reconstruction.

Standard #9: Firearms and Ballistics

Students will be able to use forensic examination of guns to provide evidence that can be used to help solve crime

Performance Indicators:

- 9.1 I can distinguish among the different types of firearms
- 9.2 I can compare and contrast entrance and exit wounds as well as the three types of tool marks
- 9.3 I can distinguish among the various forms of firearms evidence including size, shape gunshot residue and presence of burns.
- 9.4 I can apply appropriate formulas to estimate the height of a shooter based on angle and distance to the victim.
- 9.5 I can describe the contribution of SWGs and OSAC in the improvement of evidence reliability

Dear Parent/Guardian:

Your child is currently enrolled in Forensic Science for this semester. Forensic science is the application of natural sciences to matters of the law and solving crimes. Due to the sensitive nature of some of the topics covered, I want you to have the opportunity to decline your students ability to continue with this class.

This course is designed for Juniors and Seniors who have successfully completed Biology and/or Chemistry. Forensic Science is designed to encourage problem solving skills, introduce practical applications for science, and reinforce previous science and math concepts.

Because forensic science deals with criminal activity it's important for you to be aware of some of the topics covered. Students will be watching documentaries, forensic files episodes, reading articles and engaging in activities that will expose them to some of the following topics: blood and blood spatter patterns, violent crimes, crime scene photos, autopsies, stages of death, stories of murder and sexual assault and other sensitive material. My forensic science class is designed for mature, academically-oriented young men and women who are capable of dealing with this content. In addition, your student will be required to participate in labs and research that deal with the above topics. Images related to forensic science content will appear during the class. Content will be presented in a mature manner and is only for the purpose of scientific study.

If you think this content is not appropriate for your student, please reach out to their guidance counselor or myself as soon as possible to schedule them for a different class. If you agree to allow your student to take this class please sign below and have them return this form to me.

Thank you.

Pamela Smith

Parent/Guardian: _____

Student: _____

For your records:

Spaulding High School Science Safety Contract

Science investigations allow students to learn science through discovery. Many investigations utilize equipment and chemicals that must be used safely and responsibly. Science teachers will assure that you have a safe laboratory experience, but you must also do your part. Read the following safety contract. Signing the contract signifies you understand and will follow it. A parent or guardian must also sign so everyone is committed to safe laboratory practices.

1. Follow all written and verbal instructions as directed by the teacher.
2. Never attempt unauthorized experiments. Do laboratory work only when the teacher is present.
3. Keep the work area clear of everything except laboratory materials.
4. Food and drink is not allowed in the laboratory area. Do not chew gum. When using chemicals or preserved specimens, keep hands away from face, eyes, mouth, and body.
5. Students are not permitted in any chemical storage room.
6. Never run in the laboratory. To prevent accidents, be aware of your environment at all times.
7. Your teacher will describe the location of exits and all safety equipment. Know where the closest fire alarm is located.
8. Use equipment (balances, Bunsen burner, etc.) in the correct way, as instructed by the teacher.
9. Properly dispose of broken glassware and other sharp objects in designated areas.
10. Any time chemicals, heat or glassware are used, students, teachers, and visitors will use laboratory goggles. Lab aprons must be used when there is danger of chemical spills or biological contamination.
11. Long hair must be tied back and dangling jewelry and baggy clothing are not appropriate. Shoelaces must be tied and sandals are not allowed.
12. Immediately report any spills, accidents, or injuries to the teacher.
13. If a chemical splashes in your eye(s) or on your skin, flush with water. Inform the teacher immediately.
14. Never touch, taste, or smell chemicals or other substances unless directed to do so.
15. Follow all provided instructions when handling chemicals.
16. Follow all provided instructions when handling glassware, equipment, and when heating substances.
17. Never point the open end of a test tube containing any substance at yourself or others.
18. Dispose of all chemical and biological waste properly. The teacher will tell what materials can be poured down the drain and what materials must be placed in a waste container.
19. Clean all work surfaces and equipment at the end of laboratory work and return all equipment to the proper storage area.
20. Wash your hands with soap and water after performing all investigations and before you leave the laboratory area.
21. If you are unclear or confused about proper safety procedures and/or laboratory instructions, ask the teacher before proceeding.

Additional- SPECIFIC INSTRUCTIONS WILL BE GIVEN PRIOR TO LABORATORY ACTIVITIES.