Forensic Science
Course Syllabus
2016-2017

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Course Description: Forensic science is the application of multiple scientific disciplines to the investigation of criminal or civil questions of the law. Forensic science utilizes the principles, facts and lab techniques from the fields of biology, chemistry, physics, earth science, anatomy and physiology to analyze and interpret evidence within the realm of our legal system. We will begin with an introduction to scientific inquiry and the process of forensic investigation. We will then apply our knowledge of investigation to the analysis of trace evidence (hair, fiber, fingerprints etc.), DNA, blood, bodies, ballistics, toxicology, entomology, botany and anthropology. Students will actively participate in labs and activities relating to the investigation of crime scenes and the analysis of evidence while developing their writing, problem solving and critical thinking skills. In addition, the ethical, legal, and social concerns surrounding forensics will be discussed. This course meets the University of California and California State University entrance requirements. Prerequisites: 2 years of Science coursework.

Students of San Marcos High School are self-regulated learners that will graduate as empowered individuals with 21st century skills and attitudes to positively contribute to their personal, local, and global communities. In order to do this, throughout their time at SMHS, students will demonstrate growth in their ability to:

- think critically and creatively in learning and life
- produce various forms of effective communication
- productively interact within collaborative environments for learning and problem solving


Assessment / Grading:

40% - Tests / Quizzes.
30% - Lab Assignments
25% - Homework / Class Work
5% - Class Participation.

98-100% = A+
88-89% = B+
78-79% = C+
68-69% = D+
93-97% = A
83-87% = B
73-77% = C
63-67% = D
90-92% = A-
80-82% = B-
70-72% = C-
60-62% = D-

Tests/Quizzes: Tests will be given after the completion of each unit. Generally, tests will consist of both multiple-choice and short answer questions. Quizzes may be given unannounced.
**Homework:** Homework is the responsibility of the student. The student must develop regular study habits and do most assignments independently.

**Notebooks:** Notebook organization and content will be a part of your participation grade. Unit packets will be checked unannounced.

**Attendance Policy:** Students are expected to attend school daily, and be on time for class. If a student is absent from class without a valid excuse or leaves class without the teacher’s permission, he/she is considered truant. In accordance with State Education Code (49067) requirements, a student must be in class a minimum of 60 hours to receive five units of credit for that class. A student may receive a failing grade for unexcused absences exceeding ten (10) days per semester (SMUSD Board Policy 5113). Tardy: Students should be in the classroom ready to work when the final bell rings. In efforts to minimize first period disruptions, tardy students report to the Café during the first hour of school. Period 2-6 tardy students will report to the attendance office for an “admit slip.” Habitual tardy students will receive progressive discipline from the Administration Office.

**School Discipline Policy:** At the first behavioral disruption the teacher gives the student a verbal warning and contacts the parent to discuss the behavior. Subsequent behavioral disruptions will result in a referral to the Assistant Principals’ Office. The Assistant Principal will then meet with the student, may assign a consequence and mail a copy of the referral to the parent. Continued disruptions may result in the student’s withdrawal/fail from the class.

Unauthorized classroom use of electronic devices is subject to the behavior code.

**Consequences:** Items will be retained in the AP Office for pickup at the end of the student’s school day.
- 1st Offense – Pick up after school
- 2nd Offense – Parent pick up of device
- 3rd Offense – Parent pick up and Saturday School discipline

**Citizenship Grades:** The school wide citizenship grading rubric describes the characteristics of a good citizen. Tardies, lab violations (failure to clean up at the end of lab or improper use of equipment), dress code violations, or improper behavior will negatively influence your grade.

**Late Assignments:** Late assignments lose half credit. Assignments are due in the designated basket at the beginning of the class period. If absent, assignments are due on your first day back at the beginning of the period.

**Make-Up Work:** All make-up work is to be completed promptly. If absent, students are still responsible for obtaining notes/class work. Grades on make-up work will only be entered in the grade book after an absence has been cleared through the attendance office. You will not get credit for the work if the absence is not cleared! Make-up tests/assignments will be done outside of regular class time. For a planned absence, make sure to request class work before you leave or ask a classmate to pick up work for you.

**Class Rules/Procedures:**
1) Come to class prepared to learn!!!! (with all class materials, be on-time, etc).
2) Follow directions and stay on task!!!!
3) Observe all safety precautions!!!!
4) Read required chapters in textbook prior to class discussion.
5) Pop-quizzes will be given periodically. If you are absent the day of a test/quiz, your make-up exam may consist of a more challenging version of the missed test/quiz.
6) Do your own work. With the exception of group or partner work requiring one paper with multiple names, all work must be your own. Copied papers will result in a “0” grade and may not be made up, even if only part of the work was copied.
7) Hall passes: no passes are allowed the first 15 minutes of class, and you are not to interrupt my teaching to leave class. Abuse of pass privileges will result in restriction of use.
8) Food and drink: Food and sodas are not allowed in class. Water is acceptable on non-lab days.
Expected Student Outcomes / Course Outline:

Major Student Outcomes

- Apply the major concepts in chemistry, biology, physics, earth science, anatomy and physiology as the basis for solving crimes.
- Design and conduct scientific investigations by identifying questions and concepts that guide forensic science.
- Use technology and mathematics to improve investigations and communications.
- Understand and apply proper techniques, safety considerations, and equipment use in order to analyze evidence in a Forensic laboratory.
- Formulate and revise scientific explanations and models using logic and evidence.
- Recognize and analyze alternative explanations and models.
- Communicate and defend scientific argument.
- Achieve scientific literacy or the ability to use and apply scientific principles in everyday life by analyzing various types of literature from content related texts, research papers, journals and articles.

**Semester 1**

Unit 1—Introduction
- History & Development of Forensic Science
- Areas and Branches of Forensic Science
- Locard’s Exchange Principle
- Judicial System

Unit 2—The Crime Scene
- Scientific Method and Experimental Design
- Laboratory Notebook Documentation
- Observations & Deductive Reasoning
- Evidence Collection, Processing, Analyzing and Handling
- Isolation and Contamination
- Crime Scene Reconstruction/Sketching
- Digital Photography
- Document Analysis

Unit 3—Molecular Biology
- DNA Structure & Function, Replication
- Mendelian Genetics
- DNA Collection, Extraction, & Amplification
- PCR Lab / Gel Electrophoresis / DNA Fingerprinting
- CODIS – DNA Database

Unit 4—Fingerprint Evidence
- History of Fingerprints
- Development of Fingerprints in utero
- Fingerprint Classification and Analysis
- Fingerprinting Techniques
- Detection of prints: Ninhydrin / Super Glue

Unit 5—Hair & Fiber Evidence
- Microscope Types
- Growth and Development of Hair
- Hair Types varying by race, location and treatments
- Microscopic Analysis Human/Non-Human
- Fiber Classification and Analysis

Unit 6—Blood Evidence
- Blood Composition
- Blood Typing
- Detection: Latent stains / Luminol
- Blood Spatter Analysis & Reconstruction
**Semester 2**

**Unit 7—Ballistics / Tool Mark Evidence / Plant Evidence**
- Firearm Analysis
- Bullet Striation Analysis
- Trajectory Analysis
- Explosives & Fire Analysis
- Tool Impression Analysis
- Soil Composition and Chemical Analysis
- Flower Structure and Function
- Pollen, Seed, Spore Analysis – Life Cycle, Location, Time and Characteristics

**Unit 8—Death & Decomposition**
- General Characteristics
  - Antemortem and postmortem
  - Stages of Mortis (Rigor, Liver & Algor)
  - Soft Tissue Decomposition – Biological and Chemical Process
  - Core Body Temperature
- Trauma
  - Wound Patterns, Defense Wounds and the Healing Process
- Autopsy
  - External/Internal Examination
  - Dissection (Fetal Pig)
  - Cause of Death
- Entomology
  - Life Cycle of Insects and Conditions that Affect Cycle
  - Arrival of Insects and Functions at Crime Scene
  - Prediction of Time of Death Based on Life Cycle
  - Toxins and Larvae – Our Body and how we process various toxins

**Unit 9—Forensic Toxicology**
- Nervous System Overview
- Effects of Drugs/Toxins on Nervous System
- Chemical Comparison & Analysis
- Stomach Content Analysis

**Unit 10—Forensic Anthropology**
- Skeletal System Overview
- Bone Comparison: Sex, Race, Occupation, Age, Height
- Bone Deterioration – Causes and Identification
- Forensic Odontology (Teeth) – Structure and Function
- Bite Mark Patterns and Significance of Dental Records

**Unit 11—Careers**
- Degrees and Career Paths

**Unit 12—Final Project**
- Final Crime Scene - Evidence Collection
- Crime Scene Reconstruction
- Analysis & Interpretation of Evidence
- Final Exam
- Court Case based on the Final Crime Scene
  1/2 the Students will act as the Prosecution.
  1/2 the Students will act as the Defense.
  A Jury of Teachers will decide whether the defendant is Guilty or Not Guilty.
Parents,

Making this an exceptional year for your student will take our combined efforts; clear communication is a must. The quickest and most convenient way to reach me is by email at huy.nguyen@smusd.org. Parents, please discuss any special needs that your student may have. Please feel free to contact me at any time. I look forward to meeting you at Back to School Night.

I have read the course description and class policies for Forensics and have discussed it with my student.

Student Name (print) __________________________
Special Needs ________________________________

Parent/Guardian Signature ______________________

Contact Info

Mother/Guardian Name __________________________
Home Phone _________________________________
Work Phone _________________________________
Best time and place to call ______________________

Email Address ________________________________

Father/Guardian Name __________________________
Home Phone _________________________________
Work Phone _________________________________
Best time and place to call ______________________

Email Address ________________________________
Please read over the information below. In order to use the Google Chromebook for required class activities, you must be responsible for adhering to these rules and policies at all times. Remember, the device is at all times property of SMUSD, not your personal device. Violation of these regulations can result in loss of the device. You must return this signed contract on or before the due date in order to activate your computer use for this class.

- Only use the device that is assigned specifically to you; do not let other students use or borrow your device.
- If you notice that something is wrong with the device, report to your teacher immediately.
- Do not place books or other items on top of or under the device.
- Never leave your device unattended.
- Shutdown the device completely before charging the device for the next day.
  - This should occur at the end of every class period.
- Students should not personalize their devices in any way. This includes decals, screen savers, and downloading any software, application or short cuts that have not been explicitly allowed by the teacher (devices will be periodically checked for illicit downloads).
- Only use the device for school work.
- No water is allowed around the devices.

**Responsible Usage Policy Students must:**

- Respect and protect their own privacy and the privacy of others.
  - Use only your assigned accounts.
  - Keep personal information such as: name, address, phone number, etc., offline.
  - Keep passwords secret.
  - Have permission to photograph, videotape and post images or videos of people to the Internet.
- Respect and protect the copyrighted/intellectual property of others.
  - Cite all sources appropriately.
  - Follow all copyright laws.
  - Use electronic communication devices appropriately to assure academic integrity.
- The primary purpose of the use of the netbook is for students to collaborate on school activities and communicate with school staff and peers.
- Students are responsible for good behavior while using any form of digital communication (i.e. email, chat, twitter, etc.)
- Access to technology is given to students who agree to act in a considerate and responsible manner. Access is a privilege – not a right. Access entails responsibility.
- Students are responsible for messages sent from their accounts as well as work submitted from their accounts (i.e. turnitin.com submissions).

Name: __________________ Signature:__________________________Assigned Computer #_____

Parent’s name: __________________ Signature: __________________ Date: _____