Course Description

A. COVER PAGE

1. Course Title
Forensic Science

2. Transcript Title / Abbreviation
Forensic Sci

3. Transcript Course Code / Number
SC 3055. SC 33056

4. School
Santa Maria High School

5. District
Santa Maria Joint Union High School District

6. City
Santa Maria, CA

7. School / District Web Site

8. School Contact

Name: Patrica Wagner

Title/Position: Science Teacher

Phone: 925-2567   **Ext.:** 3362

Fax:

E-mail: pwagner@smjuhsd

9. Subject Area

- [ ] History/Social Science
- [ ] English
- [ ] Mathematics
- [x] Laboratory Science
- [ ] Language other than English
- [ ] Visual & Performing Arts (for 2003)
- [ ] College Prep Elective

10. Grade Level(s)

11. Seeking "Honors" Distinction?

- [ ] Yes   [x] No

12. Unit Value

- [ ] 0.5 (half year or semester equivalent)
- [x] 1.0 (one year equivalent)
- [ ] 2.0 (two year equivalent)
- [ ] Other: _____

13. Date of School Board Approval

14. Was this course previously approved by UC?   [ ] Yes   [x] No   If so, year removed from list? _____
Under what course title? _____

15. Is this course modeled after an UC-approved course from another school?   [ ] Yes   [x] No
If so, which school(s)? _____

16. Pre-Requisites
Biology, Chemistry

17. Co-Requisites
None

18. Brief Course Description

Forensic Science is a class that will increase a student's knowledge and practical application of current methodologies utilized in the area of crime scene investigation. This is a class that will provide an avenue for students to use the scientific method to solve real-life crime situations. Students will use logical and critical thinking skills to process and evaluate information and evidence in order to arrive at a successful solution to any number of scenarios based on actual and mock crime scenes. Students must apply their knowledge of biology, chemistry, physics, and biotechnology in order to develop solutions within a forensic science context.

Course Content

Course Goals:

Topics in Forensic Science will provide students an opportunity to show or improve:

1. their ability to problem solve using the scientific method and their knowledge of biology, chemistry, physics, and biotechnology.

2. their ability to investigate a crime scene using the current methodologies of a forensic scientist which requires key observation skills, evidence gathering skills, evidence analysis, critical thinking, developing testable hypotheses, and scientific experimentation.

3. their ability to research using current Internet forensic sites, current textbooks, and journals to produce a research project

4. their reading skills by offering a wide array of appropriate and challenging materials. Reading will be a significant source of current information needed to increase their knowledge of the subject area, as well as to research their hypotheses from which they will develop their experiments.

5. their math skills by requiring accurate measuring of crime scene evidence, as well as computations associated with the analysis of the evidence, as well as being able to utilize scientific measuring equipment with precision and accuracy.

Course Objectives:

Forensic Science will prepare students to:

1. apply knowledge of science courses in a relevant and hands-on format that will stress application of the knowledge rather than just an understanding of it.

2. accurately collect and analyze data by using the current tools used by scientists.

3. evaluate information and formulate conclusions using the scientific method

4. increase their use of language, mathematics, and reading

5. increase their ability to think critically and solve problems through direct investigations related to crime scenes.

6. increase their ability to apply scientific problem solving in the context of forensic science

COURSE OUTLINE

I. Overview of Forensics
    A. The scientists
    B. Parts of the crime lab
    C. Legal aspects
        1. Miranda Warnings
        2. Constitutional Amendments
        3. Penal Law

II. The Crime Scene
    A. Securing the crime scene
    B. Collecting of evidence
    C. Diagramming the crime scene
        1. Rough sketch
        2. Smooth sketch
    D. Crime scene reconstruction
    E Frey's Principle

III. Types of Evidence
    A. Fingerprints
        1. Identifying different types
        1. Latent vs. visible prints
        2. Printing suspects
        3. Classification of Prints

    B. Serology (Blood)
        1. Types of blood
        2. Stain patterns of blood
        3. Collection and preservation of blood
        4. Principles of heredity
        5. Forensic characterization of semen
        6. Collection of rape evidence

C. DNA
  1. What is DNA?
  2. How is DNA used by law enforcement?

D. Firearms
  1. Ballistics
  2. Collection and preservation of firearm evidence
  3. Matching bullets
  4. Primer residue on hands

E. Arson and Explosives
  1. Chemistry of Fire
  2. Collection and preservation of arson evidence
  3. Analysis of Flammable residues
  4. Types of explosives
  5. Collection and analysis of explosives

F. Hair and fiber evidence
  1. Identification and comparison of hair
  2. Collection of Hair evidence
  3. Types of fibers
  4. Collection of fiber evidence

G. Glass and soil
  1. Physical properties of glass
  2. Collection and preservation of glass evidence
  3. Characteristics of Soil
  4. Collection an preservation of soil evidence

Texts and Supplemental Instructional Material

Primary text: Saferstein, Richard. Criminalistics: An Introduction to Forensic Science, 6th Edition
Supplemental texts: Houde, John. Crime Lab: A Guide for Nonscientists
          Genge, N.E. The Forsensic Casebook
          Platt, Richard. Crime Scene: the Ultimate Guide to Forensic Sciene
          Evans, Colin. The Casebook of Forensic Detection.
          0Walker, Pam. Crime Scene Investigations Real-Life Science
Supplemental Instructional Materials:
          Court TV, Zeno's Forensic Site, Reddy's Forensic Page, National Forensic
Science Technology
           Center, Forensic Videos

Methods of Assessment

Students will be assessed continuously throughout the course in a variety of ways in order to allow for an accurate and varied method of evaluation. The following strategies will include, but are not limited to:

1. written test and quizzes with both subjective and objective questions
2. performance based evaluations, including experiments, demonstrations, simulations, debates, and projects
3. written assignments both as individuals and as teams that could include justifications, investigations, comparisons, and evaluations of research
4. individual and peer assessments

Instructional Methods

Methods of instruction will include but are not limited to:

1. direct instruction through lecture, readings, labs, essays, presentation, and guest speakers
2. laboratory investigations and projects
3. self-directed, cooperative, and collaborative learning
4. use of a variety of instructional materials and resources including the electronic media, scientific journals, community professionals

COURSE DATA

Title: Forensic Science
Department: Science
Grade Level: 11-12   2 Semester Course (10 units)
Prerequisites(s)   Biology and Chemistry

Target Group: This course is recommended for students in grade 11 and 12 who plan to attend a four-year college or university and who have an interest in pursuing forensic science as a career. Students should have a basic understanding of both Biology and Chemistry.

Lab fees: none

Course Purpose:

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6. increase their ability to apply scientific problem solving in the context of forensic science

Standard of Expected Student Achievement
Upon completion of this course, students will be able to demonstrate the following knowledge and skills:

1. Describe the history of Forensic Science, the parts of a crime lab, and the legal aspects involved in crime scene investigation.
2. Describe and exhibit the proper way to secure a crime scene, collect evidence, and reconstruct the crime scene.
3. List and describe the various types of physical evidence used in crime scene investigation.
4. Describe and exhibit the correct way to collect and preserve the various types of evidence.
5. Apply the scientific method in order to form hypotheses and test them in a crime scene context.
6. Use the basic scientific tools and instruments
7. Solve a simulated crime scene by applying all the knowledge and skills learned throughout the course.

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2. formance based evaluations, including experiments, demonstrations, simulations, debates, and projects
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Instructional Methods and Activities

Methods of instruction will include but are not limited to:

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2. laboratory investigations and projects
3. self-directed, cooperative, and collaborative learning
4. use of a variety of instructional materials and resources including the electronic media, scientific journals, community professionals

Instructional Materials: Criminalistics by Richard Saferstein 6th edition,

 Supplementary forensic science lab book and other texts, guest speakers, web sites specific to forensic science, Court TV, forensic videos