

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM: BIOLOGICAL AND PHYSICAL SCIENCES

1. **Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

BIOL 343. FORENSIC SCIENCE (3)

Two hours of lecture and three hours of lab per week. .

A survey of the various chemical and biological techniques used in obtaining and evaluating criminal evidence. Topics include: chromatography; mass spectrometry (LC-MS, GC-MS); atomic absorption spectrometry; IR, UV, fluorescence, and X-ray spectroscopies; fiber comparisons; drug analysis; arson/ explosive residue analysis; toxicological studies; blood typing; DNA analysis; population genetics; firearm identification; and fingerprint analysis. Lab fee required.

Same as CHEM 343. GenEd: B1, B2 and Interdisciplinary

CHEM 343. Forensic Science (3)

Two hours of lecture and three hours of lab per week.

A survey of the various chemical and biological techniques used in obtaining and evaluating criminal evidence. Topics include: chromatography; mass spectrometry (LC-MS, GC-MS); atomic absorption spectrometry; IR, UV, fluorescence, and X-ray spectroscopies; fiber comparisons; drug analysis; arson/ explosive residue analysis; toxicological studies; blood typing; DNA analysis; population genetics; firearm identification; and fingerprint analysis. Lab fee required.

Same as BIOL 343. GenEd: B1, B2 and Interdisciplinary

2. **Mode of Instruction.**

	Units	Hours per Unit	Benchmark Enrollment
Lecture	2	1	25
Seminar			
Laboratory	1	3	25
Activity			

3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

Elective in Chemistry and GE: B1, B2 and Upper division Interdisciplinary

Students who successfully complete this course will be able to:

- Describe the scientific method and how it is used to approach scientific problems
- Explain the basic scientific principles that form the basis for forensic science analysis techniques, including chromatography, mass spectrometry, spectrophotometry, toxicology, and DNA analysis
- Perform experimental techniques used by Forensic Scientists
- Interpret experimental results obtained from crime scene analysis
- Integrate chemical and biological concepts as they relate to forensic science
- Explain the scientific principles behind and limitations of forensic science analysis techniques

4. **Is this a General Education Course**

YES

NO

If Yes, indicate GE category:

A (English Language, Communication, Critical Thinking)	
B (Mathematics & Sciences)	X
C (Fine Arts, Literature, Languages & Cultures)	
D (Social Perspectives)	
E (Human Psychological and Physiological Perspectives)	

5. **Course Content in Outline Form.** [Be as brief as possible, but use as much space as necessary]

An Introduction to Forensic Science

Definition and Scope of Forensic Science
Historical context of the development of Forensic Science
Deductive and Inductive Reasoning
Scientific Method

The Crime Scene

Measurements and observations
Collection of physical evidence
Types of physical evidence

Chemical Analysis

Gas and liquid chromatography
Spectrophotometry
Mass spectrometry
Atomic absorption spectrophotometry

Physical Analysis

Optical microscopy
Scanning electron microscopy

Toxicology of Drugs and Alcohol

Drug classifications and characteristics
Physiological effects of drugs
Drug and alcohol laws
Identification of drugs
Toxicology

Arson and Explosives

Chemistry of fire
Analysis of flammable residues
Explosive classifications and characteristics

Serology

Protein/ enzyme structure and function
Identification of body fluids

DNA Analysis

Structure, function, and replication of DNA
Heredity and DNA
Basic probability and statistics
DNA fingerprinting and population genetics

Fingerprints

History of classification system for fingerprinting
Digital imaging and methods of detecting fingerprints

Trace Evidence

Hair and fibers
Paint

6. **References.** [Provide 3 - 5 references on which this course is based and/or support it.]

Saferstein, R. *Criminalistics: An Introduction to Forensic Science*, 7th Edition, Prentice Hall, 2001.
Houde, J. *Crime Lab: A Guide for Nonscientists*, Calico Press, 1999.
Eckert, W. C., Ed. *Introduction to Forensic Sciences*, 2nd Edition, CRC Press, 1997.
Saferstein, R. *Forensic Science Handbook*, Volumes 1 and 2, Prentice Hall 1988.
Handbook of Forensic Science, U.S. Government Printing Office, 1994.

7. List Faculty Qualified to Teach This Course.

Dr. Simone Aloisio, Dr. Philip Hampton, Dr. Louise Lutze-Mann, Dr. Ching-Hua Wang

8. Frequency.

a. Projected semesters to be offered: Fall X Spring X Summer

9. New Resources Required.

None. Equipment available from chemistry and biology laboratories

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)
(See Attached Forms)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Philip Hampton 1/8/03
Proposer of Course Date

Consultation:

Prof. Ching-Hua Wang

Date

Prof. Louise Lutze-Mann

Date