

UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DISCIPLINE/DEPARTMENT: Chemistry **IMPLEMENTATION DATE:** Fall 1997

Course Revised Implementation Date: September 2002

Course to be Reviewed: September 2006

CHEM 150 Introductory Forensic Science 4

SUBJECT/NUMBER OF COURSE **DESCRIPTIVE TITLE** **UCFV CREDITS**

CALENDAR DESCRIPTION: Chem 150 is intended for students who are either (a) enrolled in the UCFV Criminal Justice Diploma Program, or (b) enrolled in the UCFV Bachelor of Arts (Criminal Justice) Degree Program, or (c) require a lab science course to fulfil the requirements for other UCFV programs. It is an introductory lab course for students with little science background, and covers chemical, physical and biological aspects of forensic science. Chem 150 will satisfy the lab science requirement for a BA degree.

WARNING: Some of the course material might be of a disturbing nature.

NOTE: CHEM 150 cannot be used to meet the requirements for the Chemistry major or minor programs. CHEM 150 is not open to students with CHEM 101 or above.

RATIONALE: Chem 150 is intended to provide important background material for criminology students intending to enter either (a) the UCFV Criminal Justice Diploma Program, or (b) the UCFV Bachelor of Arts (Criminal Justice) Degree Program. The course will provide students with information on the origins, scientific background, significance and implementation of the many forensic procedures that they will encounter in the work-place.

COURSE PREREQUISITES: Any one of Biology 11, Chemistry 11, Physics 11, Earth Science 11, or Computer Studies 11

COURSE COREQUISITES: None

HOURS PER TERM FOR EACH STUDENT	Lecture	42	hrs	Student Directed Learning	
	Laboratory	42	hrs	Other - specify:	hrs
	Seminar		hrs		
	Field Experience		hrs		hrs
				TOTAL	84

MAXIMUM ENROLMENT: 24

Is transfer credit requested? Yes No

AUTHORIZATION SIGNATURES:

Course Designer(s): Lesley Spier

Chairperson: N. Weinberg
Curriculum Committee

Department Head: N. Weinberg

Dean: W. Welsh

PAC: Approval in Principle
(Date)

PAC: Final Approval: October 24, 2001
(Date)

Chem 150

NAME & NUMBER OF COURSE

SYNONYMOUS COURSES:

(a) replaces N/A
 (course #)

(b) cannot take N/A for further credit
 (course #)

SUPPLIES/MATERIALS:

All lab supplies are provided.

TEXTBOOKS, REFERENCES, MATERIALS (List reading resources elsewhere)

Criminalistics, 5th Edition, R Saferstein.
UCFV Laboratory Manual for Chem 150.

OBJECTIVES:

The course is designed to enable students to:-

- (1) Carry out laboratory experiments and interpret results using scientific methodology.
- (2) Understand the origins, scientific background, significance and implementation of the many forensic procedures that they will encounter in the work-place.

METHODS:

Presentation of the course will be by inter-related theory classes ("lectures"), discussion periods ("tutorials") and weekly laboratory sessions. Audio-visual aids will be used where appropriate, and, if possible, guest speakers will give seminars illustrating the work-place application of forensic science.

STUDENT EVALUATION PROCEDURE:

Evaluation will be based on the following system:

First In-Term Test	15%
Second In-Term Test	15%
Third In-Term Test	15%
Laboratory Reports	25%
Final Examination	30%

Both the lab and theory parts of the course must be passed in order to pass the course.

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COURSE CONTENT

The course will be based on the required text (Saferstein). Many case studies will be used to illustrate each topic, and the course will make use of reprint materials.

1. **Introduction.** Definition and scope of forensic science. The scientific method. The role of the forensic scientist in criminal cases.
2. **The Crime Scene and Physical Evidence.** Securing and isolating the crime scene. Recording the scene. Protection of the crime scene. Types of evidence. Collection of evidence. Types of information revealed by physical evidence.
3. **Glass and Soil Analysis.** Physical properties - temperature, mass, density and refractive index. Composition of glasses and soils. Techniques for identification of glasses and soils.
4. **Fiber and Hair Analysis.** Types of fibers. Nature and structure of hair. Collection of fiber and hair evidence. Identification and comparison of hair and fiber evidence.
5. **Identification of paints and plastics.** Types of paints and other coatings. Collection of paint evidence. Physical methods of paint and plastic identification.
6. **Drugs and Toxicology.** Classification and description of drugs. Methods of drug and poison identification. Blood alcohol and breath alcohol analysis.
7. **Serology.** The nature of blood. Characteristics of bloodstains. Analysis of semen and saliva evidence. Collection of evidence involving body fluids.
8. **DNA Analysis.** Biochemistry of DNA. DNA typing.
9. **Fingerprints.** Principles of fingerprints. Classification of fingerprints. Methods of detecting and preserving fingerprints. Fingerprint identification.
10. **Arson Accelerants and Explosives.** Chemistry of fires and fuels. Fire patterns. Collection of arson evidence. Analysis of flammable residues. Types of explosives. Collection and analysis of explosives.
11. **Firearms and Tool Marks.** Comparison of bullets and cartridge cases. Tool and other marks.

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COURSE CONTENT (cont'd.)

Laboratory Experiments.

Nine or ten labs will be chosen from the following:

1. Handwriting and Chromatographic Separation of Inks and Dyes.
2. Analysis of Hair.
3. Alcohol Analysis Lab: The Breathalyser.
4. Shoeprints and Soil Analysis.
5. Ballistics.
6. Toxicology: Wet Chemical Analysis of Poisons.
7. Fingerprinting Techniques.
8. Blood Analysis.
9. Analysis of Paint Samples Using Infra-Red Spectroscopy.
10. Fabric Identification.
11. DNA Fingerprinting.
12. "Whodunit" Lab.
13. Plastic Identification
14. Visit to RCMP Forensic Lab.

Reading Resources:

Davies, Geoffrey. Forensic Science, 2nd ed. A.C.S., 1986.
De Forest, Peter R, Gaensslen R.E. and Lee Henry C. Forensic Science, 1st ed. McGraw-Hill, 1983.
Broad, Geoffrey. Science and Criminal Detection, 1st ed. MacMillan, 1988.
Maehly, A. and Stromberg, L. Chemical Criminalistics, 1st ed. Springer-Verlag, 1981.
Thorwald, Jurgen. Crime and Science, 1st ed. Harcourt, Brace and World Inc., 1967.
Gerber, Samuel M. Chemistry and Crime, 1st ed. A.C.S., 1994.
Hollien, Harry. The Acoustics of Crime, 1st ed. Plenum Press, 1990.
Bertsch, W., Holzer, G. and Sellers, C.S. Chemical Analysis for the Arson Investigator and Attorney, 1st ed. Huthig Buch Verlag, 1993.