

Chem 150

NAME & NUMBER OF COURSE

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.