

Chemistry II (Instrumental Theory)

GC/MS

PerkinElmer technical personnel and invited guest presenters will provide a 1 day GC/MS short course covering instrument theory, tuning, hardware selection, column technology, and system and method optimization. This course is intended to provide the attendee with a better understanding regarding why GC/MS is used. The last hour of the course will be an open discussion focusing on court challenges to GC/MS data.

FTIR

PerkinElmer technical personnel will provide a 1 day FT/IR Microscopy short course. This short course will focus on the use of the FTIR-Microscope/Imaging (PerkinElmer Spotlight 200/400) system on forensic samples and will be given in morning and afternoon sessions. The morning session will consist of lecture material, which will discuss the basics of FT-IR microscopy, from spatial resolution to the important components of typical FT-IR microscopes. The fundamentals of microscope operation, sample preparation, and data handling will be described, and some common applications will be presented. Finally, the afternoon session will focus on attendee samples, with some hands-on use of the FT-IR microscope system. Attendees are encouraged to bring samples!

RAMAN

Raman spectroscopy is an exciting and valuable tool for forensic scientists in the identification and characterization of case evidence. It offers incredible spectroscopic sampling capabilities with no sample preparation or handling. Often, macroscopic samples are measured directly through glass containers or plastic evidence bags. On a microscopic scale, Raman microscopy routinely provides spectra of samples less than 0.5 μ m in size. Raman is also used for the identification of inorganic pigments.

In this short course, Thermo Scientific scientists will discuss the theory and practice of Raman spectroscopy with Fourier Transform (FT) and dispersive instrument. Further, Raman microscopy techniques including confocal depth profiling will be presented in detail. Course material will provide the forensic analyst a practical knowledge of Raman spectroscopy for both trace evidence and drug analysis.

The topics will include:

- Theory and design of FT and dispersive Raman spectrometers
- Raman microscopy, confocal depth profiling and chemical mapping techniques
- Raman spectroscopy in the analysis of illicit drugs and pharmaceuticals
- Raman spectroscopy of inks, toners and questioned documents

- Analysis of automobile paints and primers
- Explosives, soils and inorganics
- Specta® Multicomponent software techniques for identification of complex mixtures

Students are encouraged to bring samples for hands-on analysis.

LC/MS

Monday morning

LC Overview (1 hour)

API MS Overview (1 hour)

LCMS Techniques - Identification, Confirmation, Quantitation (1 hour)

Monday afternoon

Determination of Illicit Drugs (1 hour)

Analysis of Explosives Residues (1 hour)

Instrumentation Tour with on-site product (1 hour)