

Forensic Chemistry I

FIS 40100 (01)
Fall Course Syllabus

Mrs. Gina Ammerman

Lecturer-Forensic and Investigative Sciences Program

gammerma@iupui.edu

Office: LD 326

Phone: 274-6820

Prerequisites: FIS 206. Chemistry 310, 311, 342, 344, 410, 411. Open only to FIS majors

Textbook: Bell, Suzanne. Forensic Chemistry, Pearson Prentice-Hall, Upper Saddle River, NJ, 2006. You will also need safety glasses.

Course Description

Learn instrumental techniques in the analysis of forensic chemical evidence. Topics include chromatography, mass spectrometry, spectroscopy, weighing, and sample preparation.

Course Content and Organization

This course will cover the major techniques and instruments used in the analysis of chemical and pattern evidence commonly encountered at crime scenes. The techniques of gas, thin layer and liquid chromatography, and UV-visible and infrared spectrophotometry will be studied and used extensively. There will lecture and lab components for each of the type of instrumental analysis covered in the course.

Course objectives

1. Describe how statistical techniques can be used to describe the quality of data, classify samples or determine proper sampling protocol
2. Describe forensic techniques used on questioned documents.
3. Explain, evaluate, and identify characteristics of fingerprints
4. Understand the application of impression evidence such as tire treads and footwear and firearm and toolmark analysis used in forensic science
5. Explain the chemical principles behind acid-base, liquid-liquid, liquid-solid and solid-vapor extractions
6. Explain the principles, instrumentation and application of thin layer, gas, and liquid chromatography to the analysis of chemical evidence
7. Explain the principles, instrumentation and application of UV-visible-reflectance-fluorescence, Fourier Transform infrared and Raman spectroscopy to the analysis of chemical evidence
8. Explain the principles, instrumentation and application of mass spectrometry to the analysis of chemical evidence using both electron and electrospray ionization methods
9. Demonstrate the ability to prepare and examine samples using analytical techniques such as TLC, GCMS, Pyrolysis-GC/FID, LCMS, FTIR, Raman, UV-Vis reflectance fluorescence spectroscopy

10. Describe the chemical composition, origins and significance of the most commonly encountered types of evidence including illicit drugs, fingerprints, impressions, questioned documents, firearms and toolmarks, and trace evidence such as inks, paint, fiber, explosives, ignitable liquids, glass, hairs

OnCourse CL

You will need to have access to the internet for this course. OnCourse CL will be used on a regular basis for upload lab materials such as pre-labs, laboratory exercises, and cover sheets for the labs. We will also post lecture handouts and power point presentations on OnCourse CL. If you have questions on using OnCourse CL please ask. We will also be using the newest version of Windows (2007). Microsoft has a patch available to download for free so that you are able to open documents in 2003 written in 2007. However, UITS has Windows 2007 available to students at no cost to download, which I would recommend.

Grading	Points
3 Exams at 150 points	450
8 Pre-lab exercises at 5 points	40
8 Lab Reports at 40 points	320
8 Lab Notebook pages at 5 points	40
5 Unknown Results at 10 points	50
Total	900

Grading Scale

A: 100 – 93%	A-: 92.9 – 90%	B+: 89.9 – 87%	B: 86.9 – 83%	B-: 82.9 – 80%	C+: 79.9 – 77%
C: 76.9 – 73%	C-: 72.9 – 70%	D+: 69.9 – 67%	D: 66.9 – 63%	D-: 62.9 – 60%	F: less than 60%

Exams

There will be three midterm exams all worth 150 points which will cover material previous to exam but after last exam. Exams will be short answer and may contain multiple choice, matching, or fill in the blank questions. There will be more discussion about exams as the semester goes on. There will be no makeup exams, please see me if there is an issue with the scheduling.

Laboratory Grade

This is an important part of the course. 50% of your overall grade will come from laboratory work. Included in this are pre-lab exercises, laboratory reports, lab notebook pages, and unknown results. Pre-lab exercises are due before the start of each lab exercise. Each exercise is worth 5 points and is to be turned into your TA at the beginning of the lab period. Late pre-labs will not be accepted. Laboratory reports and notebook pages are worth a total of 45 points and are due one week after completing the lab exercise by 4:00 pm. These are to be turned in to your course supervisor or TA along with copies of your lab notebook pages for that exercise. The late penalty is 3 points per day late. This includes the total grade on report and notebook pages. Unknown results should also be turned in with your report. Late unknown results will result in 1 point per day late. Weekends do not count in days late penalty. Reports will have a cover sheet to be turned in with report. These include point break down of report and unknown result. These can be found on OnCourse CL.