

Introduction to Forensic Drug Chemistry

Department of Forensic Science
Loyola University of Chicago

Course Title: Special Topics in Chemistry-
Introduction to Forensic Drug Chemistry Analysis

Document Date: January 15, 2014
Course Number: Chem 395-004 Chem 395-005
Section Number: 4055 4552
Credits: 3 credits 1 credit
Designation: Lecture Lab
Meeting Day(s) and Time: We 4:15pm-6:45pm 7:00pm-9:30pm
Meeting Location: Flanner Rm 7 Flanner Rm 313

Instructor: Richard A. Paulas, M.S.
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Availability: by appointment

Required Text Book: No textbook required. Materials will be assigned from the internet.

Other required materials: Internet Access

Recommended supplemental texts: TBA

Course Instructional Fees: \$\$\$-Lab

Course Description: Course provides an introduction to the basic principles and uses of forensic drug analysis. The basic applications of the biological, physical, chemical, medical, and behavioral sciences currently practiced and limitations of the modern crime laboratory are presented.

Course Rationale: This course satisfies partial credit toward the BS in Forensic Science major. This course introduces the basic principles and uses of forensic science as it relates to drug chemistry analysis. The course presents the basic applications of the biological, chemical, physical, medical currently practiced and the limitations of the modern crime laboratory. Critical thinking skills, as well as problem solving skills, are essential in all areas of study. Scientific investigation in the scientific method in action. This course will aid in helping students develop these essential skills and provide them with the basic knowledge of science, that they may become productive citizens.

Prerequisites: CHEM 224/226 and CHEM 212/214

Other Recommended Courses: FRSC 381 and FRSC/CRMJ 382

General Science Objective: Students will develop basic scientific literacy, understand the scientific method of inquiry and appreciate the impact of science on society.

Learning Outcomes: The intense coverage of such cases as the O. J. Simpson trial, which included a great deal of forensic evidence and testing certainly brings to the general public crime scene searches and investigations. This course makes science relevant and pertinent to the interests and goals of those students who desire to learn more about forensic science as it applies to forensic drug analysis, which is often part of cases reported in the mass media. The techniques, skills, advances and limitations of the modern forensic laboratory are presented. Students should have some prior knowledge or background in the forensic sciences, and appreciate the impact of science on society.

1. Upon completion of this course, the student should understand the basic concepts of forensic drug analysis and testing reported in the media.
2. Upon completion of this course, the student should be able to gather and interpret data and form conclusions based on that data.
3. Upon completion of this course, the student should be able to understand and interpret media reports on topics similar in nature to forensic drug analysis and limitations to identifications, and the application of this aspect of science to legal matters.
4. Upon completion of this course, the student should be able to use logical and critical thinking skills in problem solving in this and other areas of study.
5. Upon completion of this course, the student should be able to understand the importance and wide applicability of scientific methodology to problems in all areas of their lives.

Grading and Evaluation: Your final grade will be assigned using the scale below:

A-	90 to 92	A	93 to 100		
B-	80 to 82	B	83 to 86	B+	87-89
C-	70 to 72	C	73-76	C+	77 to 79
		D	60 to 69		
		F	0-59		

Grading System:

Quizzes	10 @ 10 points each*	100 points
Mid-term		100 points
Laboratory Experiments	10 @ 10 points each*	100 points
Final Examination		100 points
Class Participation		50 points
Project		50 points
Total		500 points

*Lowest quiz grade will be dropped.

Laboratory Experiments: These will be short Lab exercises demonstrating the concepts discussed in class. They will be presented to the class at the beginning of the assigned class period.

Quizzes: There will be several quizzes given throughout the semester. Quizzes will be returned the week after they are given. If a quiz is missed, a score of "0" will be given. There are no make up quizzes. The lowest quiz score will be dropped.

Attendance: Departmental Policy on attendance applies. Students are responsible for being punctual to class, completing all assignments on time, reading assigned materials before class and participating in class discussions.

Make-up Work: There are no make-up dates for quizzes. There are NO make-up periods for laboratories

Academic Integrity: Students at Loyola University enjoy significant freedom of artistic expression and are encouraged to stretch their scholarly and artistic boundaries. However, the college prohibits all forms of academic dishonesty. For present purposes, "academic dishonesty" is understood as the appropriation and representation of another's work as one's own, whether such appropriation includes all or part of the other's work or whether it comprises all or part of what is represented as one's own work (plagiarism). Appropriate citation avoids this form of dishonesty. In addition, "academic dishonesty" includes cheating in any form, the falsification of academic documents, or the falsification of works or references for use in class or other academic circumstances. When such dishonesty is discovered, the consequences to the student can be severe.

Disclaimer Statement: This syllabus may be amended as the course proceeds. You will be notified of all changes.

Project: These exercises will be taught by the student and will deal with specific compounds routinely seen by the forensic drug analyst. Students will be asked to present the topic concerning a particular drug or drug topic. The format of the presentation will be discussed with the class as a whole.

Here is a list of useful websites. Additional ones will also be assigned as needed.

1. <http://www.deadiversion.usdoj.gov/21cfr/cfr/2108cfrt.htm>
2. <http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1937&ChapterID=53>
3. <http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1941&ChapterID=53>
4. <http://www.unodc.org/unodc/en/scientists/rapid-testing-methods-of-drugs-of-abuse.html>
5. <http://www.unodc.org/pdf/scientific/Amphetamine%20and%20Methamphetamine.pdf>
6. http://www.unodc.org/unodc/en/scientists/amphetamine_methamphetamine.html
7. http://www.unodc.org/pdf/publications/report_barbituratetest_1989-12-01_1.pdf
8. <http://www.unodc.org/documents/scientific/ST-NAR-40-Ebook.pdf>
9. http://www.unodc.org/pdf/publications/report_cannabistest_1987-02-01_1.pdf
10. <http://www.unodc.org/pdf/publications/st-nar-07.pdf>
11. <http://www.unodc.org/pdf/publications/st-nar-29-rev1.pdf>
12. <http://www.unodc.org/unodc/en/scientists/recommended-methods-for-testing-benzodiazepine-derivatives-under-international-control.html>
13. <http://www.unodc.org/pdf/publications/st-nar-19.pdf>
14. http://www.unodc.org/pdf/publications/report_testinglsd_1989-01-01_1.pdf
15. <http://www.unodc.org/documents/scientific/Global SMART Update E 8 web.pdf>
16. <http://www.unodc.org/documents/scientific/Synthetic Cannabinoids.pdf>
17. http://www.caci.org/documents/sf_crime_lab/studies_misc_materials/falsepositives.pdf
18. http://www.justice.gov/dea/docs/drugs_of_abuse_2011.pdf
19. http://www.justice.gov/dea/docs/drugs_of_abuse_2011.pdf

TOPICS TO BE INCLUDED IN THE COURSE

Class	Date	Topic	Ref
1	01/15/14	Introductions, Course Expectations Lab0-Locker assignments/Safety	
2	01/22/14	Lecture-Cannabis Lab1- Microscopic Identification	
3	01/29/14	Quiz1-Cannabis Lecture-Drugs of Abuse Lab2-Chemical Color Test	
4	02/05/14	Quiz 2-Drugs of Abuse Lecture-Measurement Uncertainty Lab 2-Balance Calibration/MU	
5	02/12/14	Quiz-3Measurement Uncertainty Lecture-Controlled Substances/Physical ID Lab-3-Physical Identification	
6	02/19/14	Quiz-4-Controlled Substances/Physical ID Lecture- Controlled Substances Act Lab4-Chemical Color tests	
7	02/26/14	-Mid-term examination Lab- No lab	
8	03/05/14	Break	
9	03/12/14	Lecture-Vis/UV Spectrophotometry/Polarimetry Lab-5-VIS/UV	
10	03/19/14	Quiz5-Vis/UV-Polarimetry Lecture- Chromatography - Lab-6-TLC	
11	03/26/14	Quiz6 -Chromatography Lecture- Gas Chromatography Lab7- Virtual GC	Student Presentations
12	04/02/14	Quiz7-Gas Chromatography Lecture- Extractions Lab8-Extractions-1	Student Presentations
13	04/09/14	Quiz8-Extractions Lecture- FT/IR Lab-9-Extractions-2	Student Presentations
14	04/16/14	Quiz9-FT/IR Lecture- Mass Spectrometry Lab-10-FT/IR-MS prep	Student Presentations
15	04/23/14	Quiz10-Mass Spectrometry Lecture- Final Exam review Lab-Cleanup-closeout	Student Presentations
16	04/30/134	Final Examination	

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