Introduction to Forensic Drug Chemistry

Chemistry 316W (Lecture and Lab) - Spring 2017 Syllabus

Lecture: Chem 316-01W (3 credit hours), T/Th, 10-11:15 am, Cuneo Hall Rm 103
Chem 316-02W (3 credit hours), T/Th, 1-2:15 pm, Cuneo Hall Rm 318

Lab: Chem 316L-01W (1 credit hour), Wednesday, 9:20-11:50 am, Flanner Hall Rms 16/11
Chem 316L-02W (1 credit hour), Wednesday, 1:40-4:10 pm, Flanner Hall Rms 16/11
Chem 316L-03W (1 credit hour), Wednesday, 4:15-6:45 pm, Flanner Hall Rms 16/11

Prerequisite: Chem 222/224 and Chem 212/214, co-requisite Chem 316L
Other Recommended Courses: FRSC 381 and FRSC/CRMJ 382

Senior Lecturer: Dr. James DeFrancesco
Office: Flanner Hall 200a, 773-508-3283
Lab: Flanner Hall 011, 773-508-3754
Office Hours: T/Th 11:30-12:45 pm, W 12:35 – 1:25 pm, and by appointment
Email address: jdefrancesco@luc.edu
(Please write "Chem 316" in the subject line of any emails. I will answer emails on a timely basis.)

Course Description

This course provides an introduction to the basic principles of forensic drug analysis. The use of microscopic, chemical, and chromatographic techniques to gather data, interpret results and form conclusions are developed. Recognizing the strengths and weaknesses in the techniques used and the correct interpretation of results is stressed.

Course Text Materials (lecture)

1. Introduction to Pharmaceutical Chemical Analysis, Wiley, ISBN 978-0-470-66122-2 (paperback)
2. Plants of the Gods, Healing Arts Press, ISBN 978-089281979-9 (paperback)

Course Objectives

The intense coverage of such cases as the O. J. Simpson trial, which included a great deal of forensic evidence and testing, has certainly raised the profile of forensic science to the general public regarding crime scene processing and criminal investigations. This course makes science relevant and pertinent to the interests and goals of those students who desire to learn more about forensic science and 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.

Upon completion of this course, the student should:

1. understand the basic concepts of forensic drug analysis and testing as reported in the media.
2. be able to acquire and interpret data and form conclusions based on that data.
3. understand and interpret media reports regarding forensic drug analysis, recognize the limitations to the work, and the application of science to legal matters.
4. be able to use critical thinking skills in problem solving and to effectively communicate the skills to non-scientific personnel.
5. be able to understand the importance and wide applicability of scientific methodology to problems in all areas of their lives.

Student Responsibilities/ Attendance

Students are responsible for being punctual to class, completing all assignments on time, reading assigned materials before class and participating in class discussions. Students are responsible for all materials and homework assignments for classes missed.

Written Assignments

Writing intensive courses differ from non-writing courses because the classroom focuses not only on course content, but also on written communication skills. In the courtroom, these skills can improve the ability of the witness to verbally communicate the analysis performed. Each in-class assignment will stress the conceptual knowledge of the previously discussed material, but will also evaluate the principles of good writing, organization, and correctness. The Writing Assignments (WA) will be more involved to include development, clarity, directness, structure, wording efficiency, and of course, proper grammar and punctuation. The evaluation criteria for each WA will be made clear and discussed before the assignment is made. If students need additional help in this area, they should contact the Writing Center for assistance. All written assignments will be typed and 1.15 spaced. The font size will be either 10 or 12. Written assignments will be submitted in hard copy form. **Email or disc submission will not be accepted. Papers that are late will be penalized 1 point per day.**

Academic Honesty

Academic dishonesty in this course will not be tolerated. Although students are encouraged to converse with one other about the topics outside of the classroom, there is a difference between sharing knowledge and cheating. Copying the work of others and presenting that work as one's own is an example of academic dishonesty. Cheating and plagiarism take many forms. Academic dishonesty during an exam can take many forms, including but not limited to: sharing materials/information with another student during the exam, looking at another student's quiz/exam sheet, talking, sharing a calculator, using a cell phone, using lecture notes, etc. This list is not meant to be exhaustive, but highlights several dishonest situations. If it is determined that materials in this course are plagiarized or have been shared between students (current or past), no credit will be given for the work in question. Cases of suspected academic dishonesty will be handled according to University policy/guidelines. Review Loyola University Chicago's policy on Academic Integrity:
http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml

Services for Students with Disabilities (SSWD) Policy

Necessary accommodations will be made for students with disabilities who procure a SSWD letter. Discuss your academic needs with the Instructor as soon as possible! However, to receive any accommodations self-disclosure, proper documentation, and registration with the SSWD office at Loyola University Chicago is required. Accommodations cannot be made until the Instructor receives proper documentation. Furthermore, accommodations are not retroactive and begin only once appropriate documentation has been received by the Instructor in a timely manner. Only those accommodations specifically listed in the formal SSWD letter will be provided. SSWD Policies and procedures can be found at: http://www.luc.edu/sswd/

Exams and Quizzes

The format of the exams will vary between multiple choice, short answer, and essay. The midterm will include all information from the lectures up to that point. The final exam will cover the remainder of the material and **will not be cumulative**. I have no plans for make-up exams.

Tutoring

The Tutoring Center at Loyola University offers free tutoring to students! Summer tutoring includes the following subjects: Biology, Chemistry, Math, Physics, and Statistics. To see the complete tutoring schedule and find additional information, visit the Tutoring Center webpage at www.luc.edu/tutoring.

Norms of Course Proceedings

The classroom is a safe place to question and explore ideas involving chemistry and other related matters. Student and Instructor voices are important to this course. Please feel free to ask questions during lecture, office hours, etc. To further the atmosphere of respect, no recording devices will be permitted during lecture or lab.

IDEA (Individual Development and Educational Assessment)

IDEA is the course/instructor evaluation system used by Loyola University Chicago. *Essential* and *Important* objectives have been selected which represent the goals and development to be achieved throughout and as a result of completing the course. Near the end of the semester, an email will be sent to you requesting the completion of the IDEA course/instructor evaluation for Chem 316W. The following objectives will be discussed the first day of class.

Essential objectives:

3. Learning to apply course material (improve thinking, problem solving, making decisions)
4. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course
8. Develop skill in expressing oneself orally or in writing
11. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view

Important objectives:

1. Gaining factual knowledge (terminology, classifications, methods, trends)
9. Learning how to find, evaluate, and use resources to explore a topic in depth

Chem 316 Lecture Schedule*

Week	Date	Chapter	Lecture Topics
1	Jan 17/19	4	intro, course expectations, measurement uncertainty,
2	Jan 24/26	-	controlled substance act, color tests
3	Jan 31/Feb 2	3, 10-14	pKa, extractions, TLC, and other methods of chromatography
4	Feb 7/9	6-8	molecular spectroscopy (UV-Vis, IR)
5	Feb 14/16	-	**quiz 1**, marijuana analysis (color tests, microscopic ID)
6	Feb 21/23	16	mass spectrometry
7	Feb 28/Mar 2	16	mass spectrometry
8	Mar 7/9	-	no class (spring break)
9	March 14/16	-	**midterm lecture exam**
10	March 21/23	20	quantitation/assay of drugs (GC-FID, other methods)
11	March 28/30	-	chiral determinations (polarimetry, derivatization)
12	April 4/6	15	other analytical techniques (CE, NMR)
13	April 11/13	-	**quiz 2**
14	April 18/20	-	TBD
15	April 25/27	-	TBD
16	May 2	-	**final lecture exam (1-3 pm section -01W)**
	May 5	-	**final lecture exam (1-3 pm section -02W)**

Chem 316 Laboratory Schedule*

WK1	Jan 18	check in, sample weighing
WK2	Jan 25	sampling, physical ID, color tests
WK3	Feb 1	extractions, TLC, and other methods of chromatography
WK4	Feb 8	molecular spectroscopy (UV-Vis, IR)
WK5	Feb 15	gas chromatography, marijuana analysis (demo)
WK6	Feb 22	**lab exam 1**
WK7	March 1	mass spectrometry
WK8	March 8	no class (spring break)
WK9	March 15	unknown analysis
WK10	March 22	quantitation of drugs (GC-FID, other methods)
WK11	March 29	other analytical techniques (polarimetry, CE, NMR, etc.)
WK12	April 5	unknown analysis
WK13	April 12	unknown analysis
WK14	April 19	**lab exam 2**
WK15	April 26	check out

**Lecture and Lab schedules are general guidelines for the course. The schedule herein is subject to alteration at the discretion of the professor based on the availability of instrumentation and the pace of the course.*

Grading System*

Lecture

midterm exam	80 points
final exam	80 points
quiz 1	10 points
quiz 2	20 points
technique profile 1	10 points
technique profile 2	20 points
technique profile 3	30 points
total	250 points

Lab

exam 1	10 points
exam 2	30 points
lab report 1	10 points
lab report 2	20 points
lab report 3	30 points
lab notebook	20 points
total	120 points

Grading Scale

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

**Please note that the grading system and point assignments are subject to alteration at the discretion of the professor based on the availability of instrumentation and the pace of the course.*

Please be aware of the following policy from the Department of Chemistry and Biochemistry

Students wanting to drop lecture after midterm may stay in the co-req lab:

*Only if the midterm grade, in lecture, posted in LOCUS, is a D or better.

*Students must continue to attend lecture until the week of the drop date to gain as much background knowledge as possible.

*For Spring 2017 students wishing to drop lecture, and have a mid-term grade of D or better, can seek assistance from the Department of Chemistry & Biochemistry office beginning Monday March 20th at 9:00am through Monday March 27 - 4:00pm.

*Students with a midterm grade of F who decide to withdraw from lecture must also withdraw from lab.

*NO EXCEPTIONS.