**JOHN JAY COLLEGE OF CRIMINAL JUSTICE**
**The City University of New York**

# FORENSIC PHARMACOLOGY

# Syllabus

**Syllabus:**

**JOHN JAY COLLEGE OF CRIMINAL JUSTICE**
**THE CITY UNIVERSITY OF NEW YORK**
**Course title and section: Forensic Pharmacology, TOX 415: Sec 1,2.**
**FALL 2013**
**Professor: Dr. Richard Stripp**
**Office: TBA**
**Contact Hours: 4 Credits**
**Email: rstripp@jjay.cuny.edu**

**Course description** This course serves as an introduction to the basic principles of forensic pharmacology. This study will emphasize the common drugs/poisons that are encountered by the practicing forensic toxicologist and the approach to determining their medico-legal role in establishing the cause of death and disease. An introduction to human performance and postmortem toxicology is presented. Key concepts related to the medico-legal consequences of the effects and toxic actions of major drug classes used in humans are emphasized. Students will learn key concepts that are important to understanding drug actions, including principles of pharmacokinetics (e.g., absorption, distribution, metabolism and excretion of drugs) as well as the physiological and cellular basis for a host of diverse drug actions. Topics that are explored include pharmacology and pharmacokinetics of drugs, impairment versus intoxication and how the interpretation of drug effect is utilized in the criminal court setting. The science of ethanol and drugs of abuse, along with other important agents (sports doping drugs, therapeutic drugs, CO etc.), will be discussed as they relate to toxicology. An introduction to the basic applied laboratory methods of forensic toxicology is also presented including; biological samples, analytical schemes, and some of the special problems commonly encountered in forensic toxicology. Lectures, directed readings, and participatory discussions will introduce the science of forensic pharmacology.

## Learning outcomes

*Reasoning*

- Categorize how various drug classes may predictably alter human physiological functions and predict the outcomes of exposures to such agents.

- Interpret scientific data obtained from multiple sources and compile this information to assess how various biological factors may alter drug actions.
- Identify the proper methods for collection of toxicological data from different biological sources.
- Accurately appraise pharmacological data and toxicological dada for clinical and legal purposes.
- Explain and justify their scientific opinions.
- Apply this knowledge to present scientific opinions in court of law.

*Knowledge*

- Identify how key factors involved in how specific classes of drug impact in human health and behavior, performance.
- Collect scientific information and utilize various media and scientific literature to identify how drugs produce these effects.
- Present information related to basic aspects of human physiology and biochemistry, and the relation to pharmacology.
- Describe the roles of the biological factors in individual and selective toxicities.

*Practical skills*

- Employ analytical skills involved in basic techniques used for qualitative and quantitative analysis of drugs and poisons in different matrixes.
- Interpret scientific data in unbiased and objective manners and recognize the what is incomplete, inaccurate or biased presentations of results and data
- Critique opinions obtained from other sources for accuracy and objectivities
- Demonstrate the conduct and behavior both in and out of laboratory consisted with relevant published professionals codes of behaviors and ethics.

*Communication*

- Participate in discussions as well as written expression of thoughts and opinions, such as case studies, written exams and assignments.
- Properly articulate and support scientific positions for both public presentations as well as for legal settings.
- Demonstrate written competence by means of assignments and examinations.

**Course pre-requisites or co-requisites: Biochemistry, Instrumental Analysis**

**Requirements / Course policies**

- Lab notebooks must be turned in by the last day of classes for grading.
- Students with a failing grade in lecture may not use the laboratory grade to pass the course
- Students are responsible for all the material presented in class regardless of their attendance.
- Absence from a laboratory section cannot be made up at a later date and will result in a grade of "zero" for that lab assignment.
- Students are expected to attend class on time and behave in a professional and appropriate manner.

**Required Texts**

Proposed texts and supplementary reading:
Levine, B.(2003). *Principles of Forensic Toxicology.* 2nd edition
AACC Press Washington D.C. ISBN: 1890883875

Klaassen, C. D. and Watkin's, J. B., *Casarett & Doull's Essentials of Toxicology*.

Library resources for this course:

The library resources for this course are extensive. These resources include research databases and science/forensic science holdings such as General Science Abstracts, Info Trac, Health Reference Center Academic, Science Direct, ACS Journals, PubMed, the forensic Bibliographic Database, and the FORENSICnetBASE. Other resources needed to offer this course:

**Grading**

**Grades:** The grade is based upon scores of the 3 exams with case studies (65%) and the Laboratory grade (see lab syllabus) (35%).

**Course calendar for lecture**

| Week | TOPICS |
|---|---|
| 1 | Introduction to the Science of Forensic Toxicology |
| 2,3,4,5 | Pharmacokinetics: Drug Absorption, Distribution, Metabolism and Excretion |
| 6,7,8 | Pharmacodynamics: Basic Receptor Theory and Drug Action, Introduction to the Clinical and Forensic Toxicology of Ethanol |
| 9 | Clinical and Forensic Toxicology of Ethanol and Other Volatiles, continued |

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|---|---|
| 10, | CNS Depressants: Benzodiazepines, Barbiturates, GHB |
| 11, 12 | Stimulant Drugs: Cocaine, Amphetamines, and other Sympathomimetics |
| 13 | Carbon Monoxide |
| 14,15 | Psychotropic Drugs & Hallucinogenic Drugs: Cannabinoids, PCP, LSD, Psilocybin, Mescaline |

****Final Exam will be given during the final exam week****

**Course calendar for laboratory**

1. Acidic Drugs: Liquid-Liquid extraction and thin layer chromatography
2. Neutral Drugs: Liquid-Liquid extraction and thin layer chromatography
3. Basic Drugs: Liquid-Liquid extraction and thin layer chromatography
4. Qualitative and Quantitative Analysis of Sulfonamides (UV)
5. Qualitative and Quantitative Analysis of Tricyclics (GC)
6. TOXI-LAB (Drug Detection System)
7. Analysis of Theophylline using Solid Phase Extraction and UV Spectroscopy
8. Acidic/Basic Drugs: SPE (Mixed-mode)
9. Blood Alcohol Concentration (Headspace GC)

**College wide policies for undergraduate courses** *(*see the *Undergraduate Bulletin*, Chapter IV Academic Standards)

A. **Incomplete Grade Policy: see bulletin**

B. **Extra Work During the Semester: Extra Credit is not available, additional readings and assignments may be given at the discretion of the Instructor.**

C. **Americans with Disabilities Act (ADA) Policies**

"Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Accessibility Services (OAS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility from the OAS which is located at L66 in the new building (212-237-8031). It is the student's responsibility to initiate contact with the office and to follow the established procedures for having the accommodation notice sent to the instructor."

Source: *Reasonable Accommodations: A Faculty Guide to Teaching College Students with Disabilities*, 4th ed., City University of New York, p.3. (http://www.jjay.cuny.edu/studentlife/Reasonable_Accommodations.pdf)

**Statement of the College Policy on Plagiarism**

Plagiarism is the presentation of someone else's ideas, words, or artistic, scientific, or technical work as one's own creation. Using the ideas or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source.

Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

It is the student‘s responsibility to recognize the difference between statements that are common knowledge (which do not require documentation) and restatements of the ideas of others. Paraphrase, summary, and direct quotation are acceptable forms of restatement, as long as the source is cited.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The Library has free guides designed to help students with problems of documentation. *(John Jay College of Criminal Justice Undergraduate Bulletin,* http://www.jjay.cuny.edu/academics/654.php , see Chapter IV Academic Standards)