Syllabus:
Professor: Dr. Richard Stripp
Office: 05.61.08 New Building
Contact Hours: 3 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 data 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:
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.
Grading

The grade is based upon scores of the 4 exams with case studies (70%) and the Laboratory grade (laboratory notebook) (30%).

Course calendar for lecture

<table>
<thead>
<tr>
<th>Week</th>
<th>TOPICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to the Science of Forensic Toxicology</td>
</tr>
<tr>
<td>2,3,4,5</td>
<td>Pharmacokinetics: Drug Absorption, Distribution, Metabolism and Excretion</td>
</tr>
<tr>
<td>6,7,8</td>
<td>Pharmacodynamics: Basic Receptor Theory and Drug Action, Introduction to the Clinical and Forensic Toxicology of Ethanol</td>
</tr>
<tr>
<td>9</td>
<td>Clinical and Forensic Toxicology of Ethanol and Other Volatiles, continued</td>
</tr>
<tr>
<td>10,</td>
<td>CNS Depressants: Benzodiazepines, Barbiturates, GHB</td>
</tr>
<tr>
<td>11, 12</td>
<td>Stimulant Drugs: Cocaine, Amphetamines, and other Sympathomimetics</td>
</tr>
<tr>
<td>13</td>
<td>Carbon Monoxide</td>
</tr>
<tr>
<td>14,15</td>
<td>Psychotropic Drugs &amp; Hallucinogenic Drugs: Cannabinoids, PCP, LSD, Psilocybin, Mescaline</td>
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</tbody>
</table>

**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)
TOX 415 Forensic Pharmacology Laboratory Course Syllabus

Instructor: Dr. Juan Zhen (jzhen@jjay.cuny.edu) and Mrs. Teeshavi Narayne (nteeshavi@jjay.cuny.edu Office 04.62.02)

COURSE OBJECTIVES
The primary objective of this course is for students to (1) learn fundamental approaches for experimentally investigating forensic pharmacological problems, (2) learn the theoretical foundations for the methods used, and (3) understand the applicability of the methods to realistic situations. Topics covered in this course include methods for the isolation, purification, and characterization of chemical compounds. These methods include liquid-liquid extraction (LLE), thin-layer chromatography (TLC), solid-phase extraction (SPE), UV/Vis spectrometer and gas chromatography (GC) and et al.

Class meeting
Every Friday (except 11-30-2012), 9:30 to 14:30

<table>
<thead>
<tr>
<th>Lab#</th>
<th>Date</th>
<th>Experimental title</th>
<th>Presentor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8-31-2012</td>
<td>Welcome/check in</td>
<td>Juan</td>
</tr>
<tr>
<td>2</td>
<td>9-7-2012</td>
<td>LLE/TLC (acidic drugs)</td>
<td>Juan</td>
</tr>
<tr>
<td>3</td>
<td>9-14-2012</td>
<td>LLE/TLC (basic drugs)</td>
<td>Anna</td>
</tr>
<tr>
<td>4</td>
<td>9-21-2012</td>
<td>Sulfonamides (TLC)</td>
<td>Samuel</td>
</tr>
<tr>
<td>5</td>
<td>9-28-2012</td>
<td>Sulfonamides UV</td>
<td>Jamila/Tamykah</td>
</tr>
<tr>
<td>6</td>
<td>10-5-2012</td>
<td>Theophylline (SPE and UV)</td>
<td>Jessica/Kristal</td>
</tr>
<tr>
<td>7</td>
<td>10-12-2012</td>
<td>TOXI-LAB (drug detection system)</td>
<td>Alyssa/Francine</td>
</tr>
<tr>
<td>8</td>
<td>10-19-2012</td>
<td>TCA (TLC)</td>
<td>Milena</td>
</tr>
<tr>
<td>9</td>
<td>10-26-2012</td>
<td>TCA(GC)</td>
<td>April</td>
</tr>
<tr>
<td>10</td>
<td>11-2-2012</td>
<td>Blood Alcohol concentration (GC)</td>
<td>Heather</td>
</tr>
<tr>
<td>11</td>
<td>11-9-2012</td>
<td>Color testing</td>
<td>Wu</td>
</tr>
<tr>
<td>12</td>
<td>11-16-2012</td>
<td></td>
<td>Elisa</td>
</tr>
<tr>
<td>13</td>
<td>11-23-2012</td>
<td>EMIT</td>
<td>Steven</td>
</tr>
<tr>
<td>14</td>
<td>12-7-2012</td>
<td>TBA</td>
<td>Waliah</td>
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</tbody>
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Textbook
Forensic Pharmacology Laboratory Manual, 4th Edition by Dr. Shu-Yuan Cheng, Mr. Bruce Eng J.D., and Mr. Argeliz Pomales. Additional background reading material might be provided.

PLAGIARISM
Plagiarism is inappropriate in this laboratory and in all other situations. Material copied from laboratory handouts, textbooks, other students, or other sources must be contained within quotes, with the source cited. Experimental work in this laboratory will be done in teams or groups. However all data analysis and writing should be performed independently.
ABSENCE
Lack of attendance, tardiness to class, and tardy assignments will be excused only with prompt written documentation needed to notify Dr. Zhen and Mrs. Narayne within 24 hr. If student has the wish to make up a missed or failed experiment, please have it discussed with Dr. Zhen and Mrs. Narayne individually.

GRADING
We will adopt 100-point grading scale. Your final score comes from three parts: lab performance, presentation and attendance. The overall grading scheme for this course is as follows:

60 % - averaged grading of all the experiments.
   In each experiment, you are credited with
   40- Laboratory Reports
   30 - Laboratory note-taking- your notebook
   20 - Pre-lab assignments
   10- Lab behavior

30 % - presentation. NO longer than 10 minutes. You can provide handouts if you want.
   Each class member will evaluate and grade your presentation, which would then be averaged as your final score.

10 % - Attendance. Full attendance will be awarded with 100 points.
   One unexcused absence will have 30 points deducted.
   The first tardiness to class (later than 20 minutes) will have 10 points deducted.
   The second tardiness will have 20 points deducted.
   The third one will have 50 points deducted.

DEADLINES.
Prelab assignments should be submitted before student attends lab work (Due to 9:30AM each Friday via blackboard or in person). Laboratory reports are due one week after completion of lab work. For special excuse, please talk with instructor. Delinquent laboratory reports will be graded according to the following schedule:

1 day late - deduct 5 points
2 days late - deduct 10 points
3 days late - deduct 20 points
4 or more days late - a grade of "0" will be given for that lab report
Saturdays and Sundays count for one day each!