

## Forensic Toxicology (FSC 508)

Fall 2009

Marianne Staretz

Office: Oberkotter 7

Phone: ext. 3608 Email: Mestaret@cedarcrest.edu

**Office hours:** Regularly scheduled office hours are: MW 1:00-2:00 and F 11:00 AM.

I am happy to help at other times, if my schedule permits. Feel free to stop by whenever I am in my office. To be sure of my availability for assistance, please schedule an appointment.

**Required textbook:** The textbook required for this course is: Levine, Barry  
*Principles of Forensic Toxicology*, Revised and updated second edition. AACCC Press, 2006.

**Course Description:** The course will introduce students to principles and methods in the area of forensic toxicology. The course will present pharmacological and toxicological principles as they pertain to commonly encountered abused and toxic substances. Discussions will focus on the toxicants, their mechanism of action, post-mortem characteristics, methods of collection and methods of preservation and analysis. The course will review basic concepts of analytical chemistry as it applies to drug and body fluid analyses. Specific methods for the analysis of alcohol, barbiturates, benzodiazepines, opioids, cocaine, marijuana, amphetamines, and hallucinogens will be presented.

**Course Objectives:** Students will understand the role of the forensic toxicologist in the forensic field of study. Students will become familiar with principles, techniques and methods associated with forensic toxicology. Students will expand on their knowledge of organic chemistry, analytical chemistry, and biochemistry in their study of forensic toxicology. Through the application of forensic toxicology, students will enhance their scientific and quantitative reasoning skills.

**Course Outcomes:** After completing this course, the students should:

- a) Understand basic principles of toxicology; understand the definition and scope of forensic toxicology.
- b) Become familiar with the types of specimens to be collected and modes of analysis in postmortem forensic toxicology.
- c) Be aware of the effects of some drugs on human performance and become familiar with some laboratory procedures related to performance testing
- d) Know general principles of forensic drug testing.
- e) Understand the principles of pharmacokinetics and their application in forensic toxicology
- f) Understand basic analytical techniques, including spectrophotometry, chromatography, immunoassay, and mass spectrometry.
- g) Understand the metabolism, pharmacokinetics, mechanism of action and methods of analysis for common drugs of abuse including alcohol, barbiturates, benzodiazepines, opioids, cocaine, marijuana, amphetamines, and hallucinogens.

**Grading policy:** The grade for this course will be determined as follows:

- a) Two one hour in class examinations will be given and each will be worth 100 points.
- b) A final comprehensive exam will be given worth 200 points.
- c) A teaching presentation on a drug of abuse (100 points)

At the end of the semester, there is a possible total of 500 points. To compute the lecture grade, add points from all exams/paper, divide by 500 and multiply by 100. The grade will be some percentage between 0 and 100%. Letter grades will be assigned based on the following scale:

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

**Lecture Policy:** Students are expected to attend all lectures. Lectures are a necessary supplement to the textbook. In the event of a missed lecture, the student is responsible for the lecture material, any assignments which were given, announcements or any other information that was provided in class.

**Attendance at Exams:** Students are required to attend class on exam days. Make-up exams will not be given without a valid excuse. Validity of the excuse will be up to the discretion of the instructor. Be forewarned; you will need to have a very good reason for missing an exam! I am not trying to be harsh. I am only trying to treat all students fairly. If the student is aware of some responsibility which will interfere with an exam date, it must be discussed with the instructor in advance. If an exam is missed without advance notice due to serious illness or emergency, a valid written excuse will be required from the doctor/school nurse in the case of illness or from the Dean of Students' Office in the case of family emergency. If the student does not have a valid excuse for missing an exam, the student will receive a zero for the missed exam. Please make note that make up exams will be harder than the original exam. In addition, your obligations for this course include attendance at the final exam, on the day and time scheduled by the Registrar's Office. You should not make travel arrangements until the final exam schedule is published; if you must make plans early, you should schedule your travel after the last final exam day.

**Honor Code:** Cedar Crest College students should uphold community standards for academic and social behavior in order to preserve a learning environment dedicated to personal and academic excellence. Upholding community standards is a matter of personal integrity and honor. Individuals who accept the honor of membership in the Cedar Crest College community pledge to accept responsibility for their actions in all academic and social situations and the effect their actions may have on other members of the College community.

**Academic Standards of Integrity:** Incumbent from the Honor Code, academic integrity and ethical behavior provide the foundations of the Cedar Crest scholarly community and the basis for our learning environment. Cedar Crest College expects students to set a high standard for themselves to be personally and intellectually honest and to ensure that other students do the same. This standard applies to all academic work (oral, written, or visual) completed as part of a Cedar Crest education.

Students who breach the Academic Standard of Integrity – as set forth in the types of academic misconduct specified under the Faculty Handbook, Book 4.B.2.a – are subject to sanctions imposed by an instructor, a department chair, the Provost, or the Board of Trustees. Such sanctions can range from, but are not limited to, the expectation to redo an assignment, the reduction in grade for an assignment or course, or the failure of an assignment or course. Extreme cases of academic misconduct, as determined by the provost or the Board of Trustees, may result in suspension or expulsion from the college, or the withholding, denial, or rescinding of academic degrees.

**Classroom Protocol:** Appropriate classroom behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations and any other behaviors that might disrupt instruction and/or compromise students' access to the Cedar Crest College education. Inappropriate classroom protocol may lead to removal from the classroom and a lowering of the lecture grade. If continuous, it can lead to forced withdrawal from the class.

**Disabilities:** Students with documented disabilities who may need academic accommodations should discuss these needs with their professor during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

### **TENTATIVE SCHEDULE OF TOPICS**

<b>TOPIC</b>	<b>CHAPTER</b>
Introduction to the course	Syllabus
General principles of Toxicology	Lecture notes
Pharmacokinetics	Chapter 4
Postmortem Forensic Toxicology	Chapter 1
Human Performance Toxicology	Chapter 2
Forensic Drug Testing	Chapter 3
Specimen Preparation	Chapter 5
Immunoassay	Chapter 8
Spectrophotometry	Chapter 6
Chromatography	Chapter 7
<b>Exam #1</b>	<b>October 9</b>
Mass spectrometry	Chapter 9
Alcohol	Chapter 11
<i>Class Presentations begin</i>	
Opioids (Part I)- Oct 28	Chapter 15
Opioids (Part II) – Oct 30	Chapter 15
Cocaine (Part I) – Nov 2	Chapter 16
Cocaine (Part II)- Nov 4	Chapter 16

GHB – Nov 6	Chapter 13
Benzodiazepines – Nov 9	Chapter 12
Barbiturates – Nov 11	Chapter 14
Amphetamines – Nov 11	Chapter 18
Marijuana – Nov 13	Chapter 17
PCP/ketamine – Nov 16	Chapter 19
LSD – Nov 18	Chapter 19
Mescaline/Psilocybin/Psilocin – Nov 20	Chapter 19
Carbon monoxide/cyanide – Nov 23	Chapter 23
Inhalants – Nov 30	Chapter 24
Metals – Dec 2	Chapter 25
<b>Exam #2</b>	<b>Dec 4</b>
Anabolic steroids – Dec 7	

**FINAL EXAM AS SCHEDULED BY REGISTRAR (Dec 11-15)**

**OTHER USEFUL TEXTBOOKS:**

1. Moffat, AC, Osselson, D, Widdop, B, eds. Clarke's Analysis of Drugs and Poisons – Volume 1 and 2, London, England: Pharmaceutical Press, 2003.
2. Karch, SB, ed. Karch's Pathology of Drug Abuse, 2<sup>nd</sup> ed. Boca Raton, FL, CRC Press – Taylor and Francis Group, 2009.
3. Karch, SB, ed. Drug Abuse Handbook, 2<sup>nd</sup> ed., Boca Raton, FL, CRC Press- Taylor and Francis Group, 2007.
4. Jickells, S and Negrusz, A, eds. Clarke's Analytical Forensic Toxicology, London, UK, Pharmaceutical Press, 2008.
5. Baselt, RC, Disposition of Toxic Drugs and Chemical in Man, 7<sup>th</sup> ed., Foster City, CA, Biomedical Publications, 2004.
6. Smith, FP, ed. Handbook of Forensic Drug Analysis, Burlington, MA, Elsevier Academic Press, 2005.

