USC School of Pharmacy

RXRS 405: Pharmacology and Sociology of Drug Abuse
(Buzzed: From Breaking Bad to Doing Good)

Instructors:  Daryl L. Davies, PhD
Professor, Department of Clinical Pharmacy
University of Southern California
ddavies@usc.edu
(323) 442-1427
MCA-9121
Office Location: HSC campus PSC 506; Office Hours (by appt).

Michael W. Jakowec, PhD
Associate Professor, Department of Neurology, Keck School of Medicine
of USC
University of Southern California
mjakowec@surgery.usc.edu
(323) 442-1057
MCA-241
Office Location & Office Hours: (TBA)

Course Weight:  4 Units (course meets 3 hours per week – one three hour session or two 1.5
hour sessions; plus 1 discussion section session)

Days/Time/Location:  Tuesday, Thursday: 11:00 am to 12:20 am, VKS 205

Introduction
Drug abuse is an “equal-opportunity affliction.” Historically, probably since the beginning of
time, humans have sought out or discovered by accident compounds that have medicinal as well
as hedonic effects. As a society, the consequences of improper drug use has also been
recognized and attempts to regulate its use is found in the literature going back as far as 2240
B.C.. Unfortunately, what is not widely recognized is that the use of legal drugs including
alcohol and tobacco cause far more deaths, sickness, violent crimes, economic loss and other
social problems compared to the use of all illegal drugs combined. This course will consider the
benefits and consequences of drug use (legal and illegal). The mechanism(s) of action and
therapies for drugs of abuse will also presented.

Objectives
This course is designed for upper-level undergraduates of both scientific and non-scientific majors
with an interest in learning about current trends that mark today’s drug climate as they explore the
social, psychological, economical and biological reasons why drug use and abuse occur. For
example, the incidence of alcohol abuse in college students is significantly higher as compared to
their aged matched peers. Students will also learn about current pharmacotherapies/treatments (or
lack of) for individuals suffering from a substance use disorder. Timely topics will be discuss such
as the relationship between the increased illegal use of prescription opioids and the rising increase
in accidental opioid overdose deaths. Differences in treatment philosophes will be presented that
are designed to lead to lively discussions during class. For example, the effectiveness of Alcohol Anonymous (AA; www.aa.org) vs other available therapies for the individual suffering from an alcohol use disorder. Students will also be introduced to the roles of different health care professionals, members of the pharmaceutical and biotechnology industry and academic scientists whom will give their individual perspectives on drug treatment strategies from their individual perspectives. Chapters from the core textbook will be supplemented with a variety of source materials including online resources and articles from scientific journals. This course should have broad appeal to many USC undergraduates including Pre-Pharmacy, Pre-Medicine and other health and life science majors as well as students in biomedical engineering, psychology, business, international studies, law and sociology.

Upon successful completion of this course you should be able to demonstrate a working knowledge of:

- The principles of drug abuse; trends and statistics; differing commonly abused drug groups
- The differing biochemical mechanisms of drug action for commonly abused drugs
- The latest biological, psychological, social-psychological, and sociological perspectives related to drug use and abuse
- The consequences of improper drug use and abuse and its relationship to health, economy, wellbeing and society.
- The signs and symptoms of drug abuse; why it is important
- Drug abuse prevention and treatment strategies; utilization of drugs/medications for the drug dependent individual
- The challenges in developing effective medications for addicted individuals
- The challenges of in-patient and outpatient therapies; what is available for the patient.
- The societal challenges and perceptions related to a drug addict versus someone diagnosed with cancer.

**Evaluation and Grading:**

Evaluation will be based on two midterm examinations, a final examination, course quizzes and class participation.

Class participation: 20 pts (10%)
4 quizzes @ 10 pts each 40 pts (20%)
2 midterm exams @ 35 pts each: 70 pts (35%)
1 final exam (partially cumulative): 70 pts (35%)
Total: 200 pts.

Class Participation and Attendance: Attendance at all classes is expected. Participation will include asking and answering questions and being actively engaged in the discussion. It is expected that students read the assigned papers prior to the lecture and be prepared to discuss background, current understanding, treatments, and gaps in knowledge for the topic in each lecture.

There will be 4 quizzes over the course of the semester that will primarily be based on questions pulled from the text book. The midterms (35 points each) will include multiple choice and T/F questions as well as a series of questions involving short answers.
The final exam (70 points) will include multiple choice and T/F questions as well as a series of questions involving short answers. The final exam will be cumulative, but will emphasize material covered after the 2nd midterm.

There are no make-up exams. If exceptional circumstances prevent you from attending an exam, your reason for missing it must be accompanied by a written statement from a third party (e.g. a note from a medical doctor).

Notes, books, calculators, electronic dictionaries, regular dictionaries, cell phones or any other aids are not allowed during exams.

Students will be asked to complete an anonymous critical evaluation of the course at its completion.

Course Readings

**Required Readings**

The text is mandatory for this course as it will greatly improve your grasp on the course content. There is a supplemental online student companion website for this course that can be accessed once the textbook is purchased. You will be able to use identified chapters in the text to support your learning process throughout the semester.

**Drugs and Society** by Hanson, Glen R., Ph.D.; Venturelli, Peter J.; Fleckenstein, Annette E., Ph.D.
Format: Paperback w/ Access Code
Pub. Date: 2018
Publisher(s): Jones & Bartlett Learning

Extensive background information on Drug and Alcohol abuse is freely available online from the National Institutes of Health.

- Alcohol Awareness Council
  http://www.alcohol.org/

**It is strongly recommended that students review these two sites:**

National Institute on Drug Abuse: http://www.drugabuse.gov/drugs-abuse
National Institute on Alcohol Abuse and Alcoholism: http://www.niaaa.nih.gov/

Other topical materials including but not limited to the syllabus, supplemental reading assignments and additional handouts will be posted on http://blackboard.usc.edu/. The students will also be encouraged to use the online discussions among students via Blackboard.

**Course Outline**

This course will be in the format of a directed seminar/lecture under the guidance of the instructor for the specific session. During each weekly session the instructor will engage the students with questions and draw comments or interpretations primarily based on the assigned reading. Students are expected to ask questions and participate in an interactive fashion. Because this is an area of rapid change in policies, the readings may vary from one term to the next. Additional readings for each section that may be of added use are listed in the table below.

Course schedule is as follows:
<table>
<thead>
<tr>
<th>Week &amp; Date</th>
<th>Topic</th>
<th>Subtopics to be Included</th>
<th>Assigned and Supplemental Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Aug. 29, 31</td>
<td>Homeostatic systems and drugs</td>
<td>Overview of the CNS; action potential; receptor classes; brain circuitry; the reward pathway; the dark side of addiction.</td>
<td>Drugs &amp; Society, Chapter 4 Required watching to prepare for week two lecture: Utube &quot;Brain Reward: Understanding How the Brain Responds to Natural Rewards and Drugs of Abuse.&quot; <a href="https://youtu.be/7VUlKP4LDyQ">https://youtu.be/7VUlKP4LDyQ</a> <a href="https://www.youtube.com/watch?v=7VUlKP4LDyQ">https://www.youtube.com/watch?v=7VUlKP4LDyQ</a></td>
</tr>
<tr>
<td>3 Sept. 5, 7</td>
<td>Quiz #1 Sept 5 How and Why drugs work or don’t</td>
<td>Dose; potency; sex differences; zero vs first order kinetics; first pass metabolism; what the body does to the drug (pk); what the drug does to the body (pd); drug tolerance; withdrawal, rebound, dependency</td>
<td>Drugs &amp; Society, Chapter 5</td>
</tr>
<tr>
<td>4 Sept 14</td>
<td>Midterm 1 Sept 14</td>
<td>Common Drug Classes: Legal and illegal (cont)</td>
<td></td>
</tr>
<tr>
<td>4-5 Sept 12, 19, 21</td>
<td>Alcohol: Pharmacological and Behavioral Effects of alcohol</td>
<td>Cost of Alcohol abuse to society; Genes vs Environment; males vs females; Alcohol Pharmacological effects; Alcohol and the university student; alcohol and the fetus – FASD</td>
<td>Drugs &amp; Society, Chapters 7-8 Utube video – “Alcohol and your Brain.” <a href="https://youtu.be/xJxANzr95F0">https://youtu.be/xJxANzr95F0</a> A 3D presentation more enjoyable watching with 3D glasses Cherry Healey – Old Before My Time – Alcohol Documentary: <a href="https://www.youtube.com/watch?v=v6vEe6eenpg&amp;nohtml5=False">https://www.youtube.com/watch?v=v6vEe6eenpg&amp;nohtml5=False</a></td>
</tr>
<tr>
<td>6 Sept. 26, 28</td>
<td>Quiz #2 Sept 28 CNS Depressants</td>
<td>Commonly used and abused depressant drugs; treatment strategies; abuse of short acting IV general anesthetics</td>
<td>Drugs &amp; Society, Chapter 6</td>
</tr>
<tr>
<td>7 Oct. 3, 5</td>
<td>Opiates -- the good and the bad</td>
<td>Narcotic analgesics -- Morphine, Fentanyl, Laudanum, Codeine, OxyContin; Opioid overdose emergency treatments; Resurgence of heroin; Methadone clinics.</td>
<td>Drugs &amp; Society, Chapter 9 Reading: &quot;CVS Sells Heroin Overdose Antidote OTC in 14 States.&quot;</td>
</tr>
<tr>
<td>8 Oct. 10, 12</td>
<td>Introduction to Stimulants - legal and illegal</td>
<td>General Principles; drug mechanisms; Case Histories, Energy drinks; caffeine; alcohol</td>
<td>Drugs &amp; Society, Chapter 10 Reading: &quot;Caffeine gives cocaine an addictive boost.”</td>
</tr>
<tr>
<td>9 Oct 19</td>
<td>Midterm 2 Oct 19</td>
<td>Common Drug Classes: Legal and illegal (cont)</td>
<td></td>
</tr>
<tr>
<td>9 Oct. 17</td>
<td>Hallucinogens</td>
<td>Haigh Asbury; mechanisms of action; Case Histories – Psychological effects</td>
<td>Drugs &amp; Society, Chapter 12</td>
</tr>
<tr>
<td>Wks 10-11 Oct. 24, 26, 31 Nov. 2</td>
<td>Quiz #3 Oct 24 Marijuana -- legal vs illegal; the controversy continues</td>
<td>Low vs High doses of marijuana; medical use of marijuana; marijuana and societal beliefs; trends and health issues.</td>
<td>Drugs &amp; Society, Chapter 13</td>
</tr>
<tr>
<td>Wk 12 Nov. 7, 9</td>
<td>Drug use in subcultures of Special Populations</td>
<td>Drugs and the student athlete; underage drug use – consequences on CNS development; Drug use on college campuses; purchasing drugs on the internet</td>
<td>Drugs &amp; Society, Chapter 16</td>
</tr>
<tr>
<td>13 Nov. 14, 16</td>
<td>Quiz #4 Nov 15 Alcohol Therapy Development</td>
<td>Example of a drug discovery program by a USC faculty to develop pharmacotherapies for AUD</td>
<td>Selected readings: 1). &quot;The Irrationality of Alcoholics Anonymous.”</td>
</tr>
</tbody>
</table>
---|---|---|---|

**Final Exam Dec 12** th 8:00-10:00 am VKC 205
Statement on Academic Conduct and Support Systems

Academic Conduct
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity http://equity.usc.edu or to the Department of Public Safety http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage http://sarc.usc.edu describes reporting options and other resources.

Support Systems
A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Emergency Preparedness/Course Continuity:
In case of emergency, and travel to campus is difficult, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies. Instructors should be prepared to assign students a "Plan B" project that can be completed at a distance. For additional information about maintaining your classes in an emergency please access: http://cst.usc.edu/services/emergencyprep.html