

USC School of Pharmacy

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

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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 be 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 discussed 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):	<u>70 pts</u>	(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.](#)

Edition: 13th ISBN13: 978-1284110876 ISBN10: 1284110877

Format: Paperback w/ Access Code

Pub. Date: 2018

Publisher(s): Jones & Bartlett Learning

- Bethany Brookshire. "Caffeine gives cocaine an addictive boost." *Psychology, Science & Society, Neuroscience*, November 17, 2015. <https://www.sciencenews.org/blog/scicurious/caffeine-gives-cocaine-addictive-boost>
- Ryan Bushey, Associate Editor. *CVS Sells Heroin Overdose Antidote OTC in 14 States*. 9/25/2015. <http://www.ddmag.com/news/2015/09/cvs-sells-heroin-overdose-antidote-otc-14-states>
- Gabrielle Glaser. "The Irrationality of Alcoholics Anonymous." *The Atlantic*. April 2015. <http://www.theatlantic.com/magazine/archive/2015/04/the-irrationality-of-alcoholics-anonymous/386255/>
- John F. Kelley and Gene Beresin. "In Defense of 12 Steps: What Science Really Tells us About Addiction." *Common Health*. April 7, 2014. <http://commonhealth.wbur.org/2014/04/defense-12-step-addiction>
- National Institute on Drug Abuse. *Commonly Abused Drugs*. August 2015. https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/commonly_abused_drugs_august_2015.pdf
- National Institute on Drug Abuse. *Drugs, Brains, and Behavior. The Science of Addiction*. April

2007.

https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/soa_2014.pdf

Extensive background information on Drug and Alcohol abuse is freely available on line 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:

Week & Date	Topic	Subtopics to be Included	Assigned and Supplemental Reading
Overview; Mechanism; Biochemistry; Action Potential; Receptors; PK/PD			
1 Aug. 22, 24	Introduction: expectations and goals of this class. General overview of drug use, abuse and drug addiction.	Historical perspective of drug abuse; The who and why of getting buzzed; Most commonly abused drugs Basic understanding of drug abuse Utube presentation in class: "Addiction: learning to forget." https://www.youtube.com/watch?feature=player_embedded&v=t7Dsg1ZObFo	Drugs & Society, Chapter 2 Explaining Drug Use and Abuse Background Readings: 1). "Drugs, Brains, and Behavior NIDA." 2). "National Institute on Drug Abuse. <i>Commonly Abused Drugs</i> . August 2015."
2 Aug. 29, 31	Homeostatic systems and drugs	Overview of the CNS; action potential; receptor classes; brain circuitry; the reward pathway; the dark side of addiction.	Drugs & Society, Chapter 4 Required watching to prepare for week two lecture: Utube "Brain Reward: Understanding How the Brain Responds to Natural Rewards and Drugs of Abuse." https://youtu.be/7VUIKP4LDyQ https://www.youtube.com/watch?v=7VUIKP4LDyQ
3 Sept. 5, 7	Quiz #1 Sept 5 How and Why drugs work or don't	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	Drugs & Society, Chapter 5
4 Sept 14	Midterm 1 Sept 14		
Common Drug Classes: Legal and illegal			
4-5 Sept 12, 19, 21	Alcohol: Pharmacological and Behavioral Effects of alcohol	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	Drugs & Society, Chapters 7-8 Utube video – "Alcohol and your Brain." https://youtu.be/zXiANz9r5F0 A 3D presentation more enjoyable watching with 3D glasses Cherry Healey – Old Before My Time – Alcohol Documentary: https://www.youtube.com/watch?v=v6vEe6eenpg&nohtml5=False
6 Sept. 26, 28	Quiz #2 Sept 28 CNS Depressants	Commonly used and abused depressant drugs; treatment strategies; abuse of short acting IV general anesthetics	Drugs & Society, Chapter 6
7 Oct. 3, 5	Opiates -- the good and the bad	Narcotic analgesics -- Morphine, Fentanyl, Laudanum, Codeine, OxyContin; Opioid overdose emergency treatments; Resurgence of heroin; Methadone clinics.	Drugs & Society, Chapter 9 Reading: "CVS Sells Heroin Overdose Antidote OTC in 14 States."
8 Oct. 10, 12	Introduction to Stimulants - legal and illegal	General Principles; drug mechanisms; Case Histories, Energy drinks; caffeine; alcohol	Drugs & Society, Chapter 10 Reading: "Caffeine gives cocaine an addictive boost."
9 Oct 19	Midterm 2 Oct 19		
Common Drug Classes: Legal and illegal (cont)			
9 Oct. 17	Hallucinogens	Haigh Asbury; mechanisms of action; Case Histories – Psychological effects	Drugs & Society, Chapter 12
Wks 10-11 Oct. 24, 26, 31 Nov. 2	Quiz #3 Oct 24 Marijuana -- legal vs illegal; the controversy continues	Low vs High doses of marijuana; medical use of marijuana; marijuana and societal beliefs; trends and health issues.	Drugs & Society, Chapter 13
Wk 12 Nov. 7, 9	Drug use in subcultures of Special Populations	Drugs and the student athlete; underage drug use – consequences on CNS development; Drug use on college campuses; purchasing drugs on the internet	Drugs & Society, Chapter 16
Prevention and Treatment			
13 Nov. 14, 16	Quiz #4 Nov 15 Alcohol Therapy Development	Example of a drug discovery program by a USC faculty to develop pharmacotherapies for AUD	Selected readings: 1). "The Irrationality of Alcoholics Anonymous."

			2). "In Defense of 12 steps."
Wks 14-15 Nov. 21, 28, 30	Drug abuse prevention and treatment	In-patient- out patient strategies; The drug addict – what happened? Why is getting buzzed so common place. Case studies in Los Angeles	Drugs & Society, Chapters 17-18 Utube viewing assignment on "Addiction Relapse Prevention Strategies." https://youtu.be/bYTp8hpSjY
Final Exam Dec 12th 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/academicssupport/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>