

SYLLABUS

830:272:B2

DRUGS AND HUMAN BEHAVIOR

Summer 2017

Class Location: SEC 118, Busch Campus
Meeting Times: Mon – Thurs; 10:30AM – 12:25PM

Instructor:

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Office Hours: By arrangement

PLEASE READ THIS SYLLABUS VERY CLOSELY.

Note: The posting of this syllabus on Sakai is confirmation that you have read this syllabus and understand the course requirements. You will be alerted in class and through email that the syllabus is available for you to review.

Course Synopsis

Human nature is fickle, curious, and abhors a vacuum (we are easily bored). People thrive on novelty and creativity. The allure of new experiences satisfies the basic characteristics of human behavior, and is at the heart both of personal growth and self-destruction. The consumption of chemical substances is one particular behavior that has long preoccupied humans due to the natural craving for pleasure and happiness, including relief from pain. *The downside of this preoccupation is addiction and dependence.* The presence in human culture of *psychoactive* drugs – mind-altering chemicals – is ubiquitous and entrenched at various levels of social activity. There are many reasons for this, and these can be analyzed from historical, sociological, biomedical and psychological perspectives. We will touch on all these perspectives, taking a *biopsychosocial* approach, that involves knowing about the neurobiological, behavioral and social factors that influence drug use and abuse. Given that any form of dependency and addiction results from a drug's psychoactive properties it is imperative to understand how the brain is “hijacked” and sometimes irreversibly changed by substance abuse. Therefore, the course will consider how the brain allows us to experience reward and pleasure, and how long-term use of drugs modifies this important aspect of brain function. Moreover, studying drugs of abuse has led to important developments in understanding how medicinal psychoactive drugs are used to treat psychiatric disorders. This latter area is particularly controversial at present, and the course will address the pros and cons of this area of psychopharmacology.

Learning Goals

- Appreciate human and animal research on how drugs of abuse impact the brain
- Understand why drugs of abuse are *psychoactive* and capable of producing dependence
- Consider the neurobiological and behavioral actions of the main classes of legal and illegal drugs of abuse
- Define *addiction*, *abuse*, *dependence*, and *tolerance* as these terms apply to drug use

- Learn about the major categories of psychoactive drugs: the stimulants, depressants, opiates, and hallucinogens
- Learn about the neurobiological and behavioral effects of cocaine, amphetamine, heroin, cannabis, alcohol and other psychoactive drugs
- Consider the motivational variables that contribute to drug-seeking behavior
- Understand the problems associated with preventing *relapse* to drug-taking behavior by addicted individuals
- Understand the management of *behavioral abnormalities* (eg., schizophrenia, depression, anxiety disorders) through pharmacological approaches, sometimes referred to as clinical psychopharmacology

Textbook:

There is no textbook. If you wish, obtain the latest edition of '[Buzzed](#)' by Kuhn and colleagues (on Amazon), for a general overview of the most common drugs of abuse that we will cover. However, publications by the National Institute for Drug Abuse (NIDA) will be posted and will be required reading when we cover specific drugs.

Readings and Handouts: Sakai site

Some readings will be provided in the assignments section on the sakai course site. These will be posted as the course progresses. Handouts (called Slide Sets) for the powerpoint lectures will be posted on sakai.

Useful websites for those with little background in neuroscience:

The early lectures will provide comprehensive details about the neurobiological basis of drug effects. However, if students have not taken a neuroscience course or physiological psychology (830:313), and are a little stuck in understanding some of the material, the following links may be helpful. Of course, always arrange to see me to get clarification on material you do not understand.

- (a) For the neuroscience novice: <http://thebrain.mcgill.ca/> (navigate to the top of the page for 'brain basics' and follow the link 'from simple to complex' – this will supplement or round out any misunderstanding from my own slides; the link 'pleasure and pain' may also be helpful, but we will go far deeper than what is provided)
- (b) On the science of addiction: <http://www.drugabuse.gov/publications/science-addiction> (this is relatively simple and meant for the public, but useful to get you oriented)

Ground Rules and Some Useful Information:

- (i) ***Before you decide to record the lecture, ASK ME.*** You will need a good reason, since there are slide sets to download, and I tend to repeat ideas and concepts quite a bit.
- (ii) ***Laptop use is allowed, but you agree to shut it down if I request it. Also, in my classes (in which I use the board and draw graphs and experimental designs) they are a disadvantage. Print off lecture slides, then use a pen. You will do so much better. Read on***

Note: this section is designed to help you. PLEASE READ.

There has been a flurry of concern regarding whether having a laptop in a note-taking class is useful for students (eg., go to these links: <https://www.washingtonpost.com/posteverything/wp/2014/12/30/this-year-im-resolving-to-ban-laptops-from-my-classroom/> and <http://www.newyorker.com/tech/elements/the-case-for-banning-laptops-in-the-classroom>). The expectation of the professor is that a student is using the laptop only to take notes, and not to check email, chat on facebook, surf the internet, watch videos, and so on and so forth. We all know this happens. When I have observed the lectures of my colleagues, I sit at the back, and it's astounding how many laptop-using students are actually scrolling through the lecture slides (very few).

Because I have received complaints from students being distracted by a laptop user's constant internet surfing and other non-class related activity (and the articles linked above and below confirm this), **if I receive a single complaint from a bystander student who is distracted by non-class related use of a laptop, the particular laptop user in question will be asked to shut it down or move to the back rows of the class.**

NOTE-TAKING WITH LAPTOPS: not an advantage. Aside from the above links, formal studies have shown that laptop users don't do as well as those using more traditional approaches (pen and paper). (eg., read this <http://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/>). Also, those sitting nearby to laptop users also fare worse (through unavoidable distraction). Over the years, I have also kept track of students who use laptops in my classes, and it matches the literature: they don't do nearly as well as hand writers. Moreover, the top students (those who fall in the top 25%) in my classes over the years have been the ones who limit any form of distraction (you guessed it, they did not use laptops, nor kept checking their smartphones). So if for some reason you cannot use a pen, and must use a laptop, stick to taking notes (in other words: turn off wifi access).

An additional note about active learning:

As the film director Woody Allen said, 95% of success is simply showing up. So come to class. Experience the physical experience of listening and watching. Handwrite your notes. Then review them as soon as possible, rewrite the notes, and organize them (using your computer if you so wish) – *in doing this, you have already had your first study session*. Moreover, you have relived the lecture before you have forgotten it. For example, try remembering lecture 2 by the time you get to lecture 7 or 8, without immediately reviewing your notes – good luck! In this course the information piles up fast and the topics change quickly – if you don't review and organize your notes, recalling ideas and descriptions of studies will seem like shoveling snow with a pitchfork, the details will slip through the cracks. And I will not give a lecture's worth of material all over again in office hours – you get one chance, the rest is your responsibility, and I will help by addressing your clarifying questions. So be diligent and get to the material quickly, do an active mental replay, and you will more effectively prepare yourself for that big crunch time – the night before the scheduled exam.

- (iii) **TURN OFF YOUR CELL PHONES!** I once had a student texting for 5 minutes right in front of me, the very front row. I stopped talking, stood over her, and said: "I can't believe you don't realize what you are doing." She turned bright red, and later realized the folly of her action, and how she must have come across. She stopped texting in class, and ultimately did well. **SO, DO NOT TEXT IN CLASS.** Before you sit down, let those important to you know that you are in class respecting the right of the professor to have your undivided attention, *since he is giving you HIS undivided attention* (if you have to make an important call or get into some vigorous text-messaging exchange,

STEP OUTSIDE). I will draw attention to you if I suspect you have “left the room” and immersed yourself in another space and time. At which point, you will not feel terribly smart.

- (iv) DO NOT ENTER INTO EXTENDED CHIT-CHAT with your neighbors – this is the height of rudeness, disrespects the professor, and MORE IMPORTANTLY disturbs the listening rights of your student peers. BTW: Feel free to tell those near you to “shut the (you know) up,” especially if you are distracted by silly giggles and mindless chatter that goes on far too long. FYI: In all my time of teaching at Rutgers (since 1998), I have thrown students out of the classroom for talking on only three occasions after being unresponsive to requests to quiet down. That’s a low rate. But IT HAPPENED.

Do good work, and respect those around you, the professor, and yourself.

Academic Integrity

I have on occasion encountered a situation of academic dishonesty, so you should be aware of the link to the Rutgers academic integrity office: <http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers/>. If you have not already done so, you should explore this, and in particular the ‘[Academic Integrity Policy](#)’ link, where you can read the levels of violation and sanctions. If during exams I determine that you are acting in a dishonest manner, you will be asked to leave the exam.

When taking an exam, merely looking at your cell phone or some other instrument or paper can instantly disqualify you from receiving a grade in that exam. Depending on the situation, further deliberation by the Professor may rule you out of receiving a passing grade altogether for the course (Note: as stated on the academic integrity website, students have the right to appeal decisions made by the Professor). In other cases, if we determine that it *appears* you are violating the rules of proper academic conduct in an exam, you will be warned or asked to move to another seat. Finally, when submitting work through an online mechanism (eg., tests, quizzes and assignments), it is expected that you will do so without the assistance of any other person, and that you are the person submitting the work. This aspect of assessment simply requires an honor code.

Assessment

Exams (75% of total grade): There will be three exams. The exams will be a mixture of written-answer and multiple choice questions. Exam 1, 25% of total grade; Exam 2, 25% of total grade; Final Exam 25% of your total grade.

Assignments (25% of total grade): Video Assignments will be provided. Questions will need to be answered and submitted in class as a hard copy. Questions for the assignments will be given in class. No submission of assignments will be accepted through Sakai. The video assignments can be taken outside of class (by streaming video content via the library computers or off-campus, such as at home); discussion of the videos will take place in class and will be related to the basic lecture material.

Extra Credit. In-class pop quizzes will be used to provide extra credit.

Grading System

There is no curving system used for grading. Students will need to achieve predetermined cut-off points for grades of A, B+, B, C+, C and D. Cut-off points will be as follows:

A 90-100 B+ 87-89.9 B 80-86.9 C+ 75-79.9 C 65 -74.9 D 55-64.9 F <55

Makeup Exams

I will need to verify all excuses for missing an exam. If you do miss an exam, the makeup will consist of a different set of questions. If the exam is missed for a legitimate and verifiable reason, the student must sit for the makeup within three weekdays (excluding the weekend) of the scheduled date for the missed exam. Written and signed documentation will be required.

IMPORTANT: Assuming you are not “out of commission,” failure to take the makeup within three weekdays of the scheduled exam will mean that you will forfeit the points that would have been earned in that exam.

If after seeing the schedule below you anticipate a conflict, you have the option of taking an exam EARLIER than the scheduled time. Legitimate reasons for this are: Rutgers athletic obligations, religious events, and other similar (predetermined and fixed) events that are going to interfere with taking the scheduled exam. It is up to you to anticipate the conflict, and let me know about these upcoming events well in advance so that we can administer the exam earlier. If you don't take the exam, then you will either (i) fail to receive any points, or (ii) have the option to take the makeup within three working days after the scheduled date for the exam.

Lecture Schedule

Please note that this is the intended flow of topics that will be covered each week. However, the timing of introducing a topic may vary. The date for each week refers to the Monday of that week (except for Week 1).

Week 1 (first class is 5/30): Overview of drug use today and historically; Overview of the brain and how it is affected by drugs

The classification of substance abuse disorders: Addiction and Dependence

The history of drug use: attitudes and legislation

The Brain reward system: The concept of pleasure pathways in the brain

Factors That Motivate Drug Use: Personality variables; the psychosocial environment

Overview of The Nervous System: Neuroanatomy; Neurons and their organization in the brain

Imaging the brain: functional MRI studies - This is your brain on drugs!

Principles of drug action: Pharmacokinetics, routes of drug exposure, tolerance

Psychopharmacology – the study of how neurons communicate with each other chemically and what this means for behavior

Home Assignment: HBO Documentary: Addiction Part I. This is available online on HBO.com. Questions for you to answer and discuss will be given in class. You will need to submit your answers in the next class (week 2).

Week 2 (6/5): Legal Stimulants – Nicotine and Caffeine; Illegal Stimulants - Cocaine, Amphetamine and Methamphetamine

Legal Stimulants

Origin and history of use; neurobiological and behavioral basis for ‘stimulant’ categorization; addictive properties; potential health benefits of caffeine and nicotinic receptors in the brain (cognitive enhancement)

Pathology: the long list of damaging health effects of smoking (not the way to enhance cognition!)

HBO Documentary: Addiction Part II (will involve home assignment as in Week 1)

Illegal (or illicit) Stimulants

Origin; neural mechanisms for stimulant effects; addictive properties; immediate and long-term effects on brain plasticity; neuroimaging studies; paradoxical use of stimulants in managing ADHD; legal and medical issues

Regular drug use and classical conditioning: when the environment of drug use comes to induce craving

Frontline Documentary: Methamphetamine Epidemic (<http://www.pbs.org/wgbh/pages/frontline/meth/>)

Questions will be provided in class and will need to be submitted in the first class of the next week.

EXAM 1 will be given in the final class of this week

Week 3 (6/12): Alcohol and Opiates

Alcohol

Origin; neurobiological effects; behavioral symptoms; basis for dependency; pathology and impact on society and the individual; impact on neurodevelopment

Opiates

Introduce the opioid system and its discovery in the brain; history of opiate use;

the neurobiology of opioid systems in the brain; a natural mechanism for pain reduction; the clinical uses of opiates

Heroin trafficking and the current opiate addiction epidemic: heroin, fentanyl, prescription opiates

What can cause an overdose and death? – a consideration of conditioned tolerance effects

Week 4 (6/19): **Marijuana (*Cannabis*)**

Origin and psychoactive ingredient of the cannabis plant - THC; legal and medical issues; cannabis receptors in the brain – does the brain make it's own marijuana?

Behavioral effects; role of receptors in cognition and mood regulation; relationship of cannabis effects to the opioid system in the brain

Interaction between the opiate and cannabinoid systems

Controversies surrounding the use of cannabis; the limitations of conducting optimal research on cannabis

The potential health benefits of cannabidiol (a non-psychoactive component of cannabis): applications in treating epilepsy

EXAM 2 will be given in the final class of this week

Week 5 (6/26): *Hallucinogens - LSD; mushrooms; ecstasy; Psychotherapeutic Medications*****

Hallucinogens

Origins and history of use; neurotransmitter actions; behavioral effects; legal and medical issues; cultural and religious practices

LSD and ketamine: two drugs receiving attention as adjuncts to psychotherapy in depressed patients

Designer Drugs: eg., ecstasy – is it safe?

Video Assignment: BBC documentary on ecstasy. Questions will be provided in class and will need to be submitted in the first class of the next week.

Psychotherapeutic Medications

Psychiatric Drugs: Antidepressants (for depression); antipsychotics (for schizophrenia); anxiolytics (for anxiety disorders)

Neurobiological basis of action – multiple neurotransmitter systems are affected: Which one is the right one?

Placebo effects: Is the pharmaceutical industry running into problems with the therapeutic efficacy of psychiatric drugs?

Week 6 (7/3): note that Tuesday July 4th is a public holiday – there will be no class

Non-drug addictions; Treatment of Substance Abuse; Prevention of Substance Abuse

Everyday activities can be addictive: sex and food intake – the reward pathways in the brain serve these behaviors

Pathologies: gambling, sex addiction, obesity

Treatment of addictive behavior: behavioral modification procedures

Models of prevention: sociocultural, proscriptive

Education, mass media, skills training

EXAM 3 (given online) on the last scheduled day of the course (July 6)