

## SYLLABUS

### **DRUGS AND HUMAN BEHAVIOR**

830:272 Summer Session I, 2012 (May 29 – July 5)

Class Location: LOR 020

Meeting Times: 6:00 PM - 9:40

Instructor:

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Summer Session Office Hours: by arrangement

*PLEASE READ THIS SYLLABUS VERY CLOSELY. IT IS THE FIRST OBLIGATION YOU HAVE TO ENSURING ME THAT YOU UNDERSTAND THE NATURE OF THE COURSE AND THE RULES OF CONDUCT AND ASSESSMENT.*

### Course Synopsis

This course addresses the ubiquitous presence of *psychoactive* drugs in human culture. The approach will be *biopsychosocial*, addressing neurobiological, behavioral and social factors that influence drug use and abuse. Given that any form of dependency and addiction that results from the excessive and unregulated use of such drugs is dependent on their psychoactive properties, it is imperative to understand how the brain is hijacked and subjugated by substance abuse. Therefore, the course will consider brain mechanisms known to promote reward and pleasure, and how long-term use of drugs modifies brain function. In addition, the study of drugs of abuse has led to important developments in our understanding of how medicinal psychoactive drugs may be used to treat psychiatric disorders and dementia. Overall, it will become apparent that while drugs of abuse modify brain chemistry, and consequently, the behavior that emerges as a function of brain activity, the ultimate behavioral changes and resistance to avoidance or rejection of drug use are driven by learning processes and fundamental changes in motivation. Human nature is fickle, curious, abhors boredom and thrives on novelty and creativity. But as the old saying goes, “curiosity killed the cat,” and we will learn that it is no different for humans.

### 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 various categories of psychoactive drugs, in particular, the stimulants, depressants, opiates, cannabis and hallucinogens
- Consider the motivational variables that contribute to drug-seeking behavior
- Understand the problems associated with preventing *relapse* to drug-taking behavior by addicts
- Understand the management of *behavioral abnormalities* (eg., schizophrenia, depression, anxiety disorders) through pharmacological approaches

### **Textbooks: none**

A textbook is not necessary for this course. However, if you need an inexpensive (less than \$20) primer on drugs of abuse purchase the following from an online store: ***Buzzed, 3rd edition; by Kuhn, Swartzwelder and Wilson.***

Useful websites:

- (a) For the neuroscience novice is the following: <http://thebrain.mcgill.ca/>
- (b) On the science of addiction: <http://www.drugabuse.gov/publications/science-addiction>

**Some Ground Rules:** I like to have a bit of fun in class as the mood strikes me. I also take teaching seriously, since it is important to deliver the material in a way I hope you can appreciate. But over the years, and given that I get older, as my audience gets younger, and technological advances are seeping into the classroom, I have come to feel that the assumptions of common civility are fast disappearing. So here are some pet peeves or ground rules:

- (i) *you can record the lecture* if you so wish – but I am not responsible for the accuracy of your translation and interpretation of what I “say” in the transcript (any doubts you have about interpretation and transcribing, you should clear up with me before you take an exam);
- (ii) you are allowed to use a laptop in class, but only to take notes, not to check email, chat on facebook, and surf the internet – you did not pay the registration fee (and during summer no less) to do what you could do at home!
- (iii) **PUT YOUR CELL PHONES ON VIBRATE!** And if you check a message, **DO NOT** enter into a text-messaging conversation; 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, please do it **OUTSIDE** the class);
- (iv) **DO NOT CHIT-CHAT** with your neighbors – this as rudeness and not only ticks me off, but **MORE IMPORTANTLY . . .** disturbs the listening rights of your student colleagues;

- (v) DO NOT FALL ASLEEP in class – that in fact, will be my mission throughout the course, keeping you awake! Beware if you wake up, Rutgers has moved, and you're swimming in a giant bowl of corn flakes . . . (don't blame me, if that's what happens).

**Exam Policy (read carefully):** If you miss an exam, you will need to provide legitimate proof for the absence. A makeup can be arranged if I decide your excuse is valid. However, you must take the makeup between 2 pm and 4 pm either before or on the next scheduled class date after the missed exam. Otherwise, the makeup exam will be deferred to the 2-4 pm period on the afternoon (NOT the evening) of the final class date, July 5.

If you know you cannot make a scheduled exam due to an unavoidable conflict about which you are already aware (after reading this syllabus and observing the critical dates), the same rules will apply as for an unexpected exam absence. Finally, if you have any form of medical problem that I should know about, notify me in advance if this is going to affect exam and/or class attendance. We can discuss it and determine whether it will actually benefit you to be in the class. **Failure to notify me of any problems (medical and/or non-medical) that potentially could impact performance and attendance will ultimately be your responsibility (and prerogative), and I will not consider it as a mitigating factor should you choose to raise concerns about your grade.**

**Class Topics and Dates (NOTE: dates are for organization, since invariably a topic is continued in the next meeting date)**

Drugs are biologically active chemicals. What make some of them addictive are their psychoactive properties. Therefore, in asking why people use drugs, you have to turn to an examination of the human (or mammalian) nervous system, the source of all behavior. Knowing about this goes a long way in understanding how drugs take hold of the individual, providing pleasure (or reward), as well as serious physical and psychological illness. Drugs can change sensations, perceptions, mood, emotions and cognition, and these very same processes can modify the biological impact of the drug, for better or worse. Therefore, in the first three classes we will be less concerned with individual drugs than we will be concerned with the relationship that we have with the drug as a substance that merges with the behaving individual.

*Tue 29-May*

**The Problem: Why care about drug use?**

**The DSM-IV classification of substance abuse disorders**

**Introduction to The Nervous System:** Neurons and their organization in the brain

*Thur 31-May*

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

**Pharmacokinetics and routes of drug exposure**

**HBO Documentary:** Addiction Part I (will involve in-class assignment)

**Brain reward system**

*Tue 5-June*

**Factors That Motivate Drug Use:** Personality variables; the psychosocial environment; the power of cognition – *The Placebo Effect*

**HBO Documentary:** Addiction Part II (will involve in-class assignment)

*Thur 7-June*

**Factors That Motivate Drug Use**

**EXAM 1**

*Tue 12-June*

**Depressants: Alcohol; Opiates (eg., heroin; morphine)**

Origin; neurobiological effects; behavioral symptoms; basis for dependency; pathology and impact on society and the individual (eg., legal and medical issues)

*Thur 14-June*

**Stimulants: Caffeine (coffee; tea; chocolate); Nicotine**

Origin; neurobiological and behavioral basis for ‘stimulant’ categorization; addictive properties; pathology; potential health benefits in cognitive disorders

*Tue 19-June*

**Stimulants: Cocaine; Methamphetamine**

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

*Thur 21-June*

Lecture: **Stimulants** - concluding points

**EXAM 2**

*Tue 26-June*

**Hallucinogens: LSD; mushrooms; club drugs (eg., ecstasy)**

Origin; neurotransmitter actions; behavioral effects; legal and medical issues

**BBC Documentary: Ecstasy** (will include in-class assignment)

*Thur 28-June*

**Cannabis**

Origin; legal and medical issues; cannabis receptors in the brain; behavioral effects; role of receptors in cognition and mood regulation

*Tue 3-July*

**Psychiatric Drugs:** Antidepressants; antipsychotics; anxiolytics

*Thur 5-July*

Final Lecture: Concluding comments and recap

**EXAM 3**