

## SYLLABUS

### **DRUGS AND HUMAN BEHAVIOR**

830:272:B2 Summer Session I, 2014 (May 27 – July 3)

Class Location: SEC 118

Meeting Times: 10:05 – 11:55 AM

#### 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 ENSURE 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 sometimes irreversibly changed 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**

There is no textbook 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.**

### **Readings: 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 for the powerpoint lectures will be posted on sakai. A password (given out in class) will be needed to open the document.

### **Useful websites for those with little background in neuroscience:**

- For the neuroscience novice: <http://thebrain.mcgill.ca/>
- 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, and I would like you to enjoy this class. However, I take teaching seriously, since it is important to deliver the material in a way I hope you can appreciate. But over the years, as I get older, and my audience gets relatively younger, and technological advances seep into the classroom (i.e. smartphones), I have come to feel that the assumptions of common civility are fast disappearing (a topic most relevant to addiction, as we shall discuss). So here are some pet peeves or ground rules:

- 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);
- 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 to do what you can do at home!
- PUT YOUR CELL PHONES ON VIBRATE! And if you check a message, DO NOT enter into a marathon 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 STEP OUTSIDE);
- DO NOT ENTER INTO EXTENDED CHIT-CHAT with your neighbors – this is rudeness, disrespects the professor, and MORE IMPORTANTLY . . . disturbs the listening rights of your student colleagues (of course, questions and clarification are always welcome)

**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. I reserve the right to deny you a makeup if you make it difficult to arrange a suitable time in a reasonable time-frame for the makeup. If necessary, the makeup will occur during the final exam.

If you know you cannot make a scheduled exam due to an unavoidable conflict, and 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 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 I will not consider it as a mitigating factor should you choose to raise concerns about your grade.**

### Grading System

**Exam 1 (20%); Exam 2 (25%); Exam 3 (30%); Assignments (25%)**

Exams will be a mixture of short-answer and multiple choice; the exams will be based on lecture material only.

Assignments will involve answering questions in class (or at home) based on viewed documentaries (available online or in class), as well as home reading assignments (questions can be answered at home, but submitted through sakai).

Extra Credit. The occasional pop-quiz will be given in class to make sure students are attending to the material and reviewing their daily lecture notes.

### **Letter Grade Determination**

Students will need to achieve predetermined cut-off points for grades of A, B+, and so on. Cut-off points will be as follows:

**A 90-100 B+ 86-89.9 B 75-85.9 C+ 71-74.9 C 60-70.9 D 50-59.9 F <50**

### **Class Topics and Dates (Note: since there are 6 weeks of daily lectures, topics arranged on a weekly basis)**

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, in much the same way that food as a chemical entity is incorporated into the body.

*Week 1 (May 27-29)*

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

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

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

**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 (this will involve an in-class assignment)

*Week 2 (June 2 -5)*

**The Brain reward system**

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

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

**EXAM 1 (Thur June 5)**

*Week 3 (June 9-12)*

**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)

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

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

*Week 4 (June 16-19)*

**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

**EXAM 2 (Thur June 19)**

*Week 5 (June 23-26)*

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

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

**Designer Drugs: eg., ecstasy** (this will include viewing of an in-class assignment based on a BBC documentary)

**Cannabis**

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

*Week 6 (June 30-July 3)*

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

**EXAM 3 (July 3)**