

## SYLLABUS

### *DRUGS AND HUMAN BEHAVIOR*

830:272:B6 Summer Session I, 2015 (May 26 – July 2)

Class Location: SEC 117

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 ENSURE ME THAT YOU UNDERSTAND THE NATURE OF THE COURSE AND THE RULES OF CONDUCT AND ASSESSMENT.*

### Course Synopsis

Human nature is fickle, curious, abhors a vacuum (aka boredom) and thrives on novelty and creativity. The allure of new experiences satisfies these characteristics of human behavior, and is at the heart both of progress and destruction. The consumption of chemical substances is one particular behavior that seems to have long preoccupied humans. The downside of this preoccupation is addiction and dependence. This course addresses the ubiquitous presence of *psychoactive* drugs – essentially ‘chemicals’ - 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 how the brain allows us to experience reward and pleasure, and how long-term use of drugs modifies this particularly important aspect of brain function. In addition, studying drugs of abuse has led to important developments in our understanding of how medicinal psychoactive drugs may be used to treat psychiatric disorders. Finally, we will consider how the study of addiction to drugs has led to new directions in combating obesity and food addiction, a situation that involves poor regulation of food intake.

### 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. Notes and readings will be posted, and you will need to supplement these by attending lectures and taking notes. 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:**

- (a) For the neuroscience novice: <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, 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 and laptops), 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:

- (i) You are all adults, want to be treated liked adults, and should act like adults. Remember that, as you read the following.
- (ii) *Before you decide to record the lecture, ASK.* If I allow it (and you will need a good reason) note that 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 in class, as well as before you take an exam);

- (iii) *Use a laptop in class if you wish.* But only to take notes, not to check email, chat on facebook, and surf the internet – you did not pay the tuition fee to do in class what you can do at home!  
**Note of caution:** I have kept track of students who use laptops in my classes, and they invariably fall below the top 25-30% of the class in performance. I use the black board quite a bit. This has also been found in more formal studies. Nothing beats eyes on the front, attentive ears, and a pen and notepad: it's a successful age-old tradition!
- (iv) **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**). I will draw attention to you if I suspect you have “left the room” and immersed yourself in another space and time: your smartphone. At which point, you will not feel very smart.
- (v) **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 colleagues. FYI: In all my time of teaching at Rutgers (since 1998), I have only twice thrown students out of the classroom for talking, and being unresponsive to requests to quiet down. That’s a low rate. But **IT HAPPENED**.

**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 2.

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 (25%); Exam 2 (25%); Exam 3 (25%); Assignments (25%)**

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

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

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: dates are for organization, invariably a given topic may begin on or extend into 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 four 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.

*Tue     May 26*

#### **Why use drugs?**

#### **The classification of substance abuse disorders**

**Overview of The Nervous System:** Neurons and Chemical Communication in the brain

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

*Thur    May 28*

**The Brain Reward System:** The pleasure pathways in the brain

**Home Assignment - HBO Documentary:** Addiction Part II (this will involve submitting answers to questions posted on Sakai)

*Tue     June 2*

**Factors That Motivate and Maintain Drug Use:** Personality and genetic variables; developmental factors

**EXAM 1:** This will be a one-hour exam given during the second half of the assigned period; new material on this day will not be examined

*Thur June 4*

**Factors That Motivate and Maintain Drug Use (continued):** The power of cognition: Conditioning, cognitive control; and the placebo effect; Stress and relapse

*Tue June 9*

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

History and origins; neurobiological effects; basis for dependency; legal issues; medical benefits

*Thur June 11*

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

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

*Tue June 16*

**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

**Frontline Documentary: The Meth Epidemic** (this will involve answering assignment questions)

*Thur June 18*

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

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

**BBC Documentary: Ecstasy** (this will involve answering assignment questions)

*Tue June 23*

**Cannabis**

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

*Thur June 25*

**Psychiatric Drugs:** The pharmaceutical industry and the treatment of mental disorders: critics and supporters; do psychiatric drugs actually work?

Major classes of drugs: antidepressants; antipsychotics; anxiolytics; neurobiological mechanisms of action

*Tue June 30*

**Food Addiction:** Whether energy intake that exceeds energy expenditure can be due to food addiction and the development of obesity

*Thur July 2*

Completion of previous material

**EXAM 3**