

## SYLLABUS

830:360:01

### DRUGS AND HUMAN BEHAVIOR

Spring 2018

Class Location: Room [AB 2125](#) - Academic Building, College Avenue Campus  
Meeting Times: Mon and Thurs, 11:30AM – 12:50PM

Instructor:

Alexander Kusnecov, Ph.D.

Psychoneuroimmunology Lab

Professor, Dept. Psychology, Busch Campus

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Office Hours: Monday 3:00 – 4:00

Office Location: Room 233a, Psychology Bldg, Busch Campus

Directions to Professor Kusnecov's office on Busch Campus

Come into the Psychology building from the Allison Road end. Walk up the outside ramp (not steps – if you are going up steps, you're on the opposite side of the building). After you enter, turn RIGHT (not left), after which you go through a single door, then onward through a large double door. You will then find yourself in a long hall (which is the 2<sup>nd</sup> floor of the bldg.), and my office will be a few doors on your right (opposite my office is my lab, Room 232; it has an orange door and yellow 'caution' signs). Note: there is another room 233 at the opposite end of the building in the Graduate School of Applied Psychology (GSAPP), which is where most people end up. You will know you are in the wrong place, since my name will not be listed next to the door.

Teaching Assistant:

Emma Millon, MSc

Dept. Psychology, Livingston Campus

Email: [emma.millon@rutgers.edu](mailto:emma.millon@rutgers.edu)

Office Hours: Wednesday 11am -12pm

Office Location: Tillett Hall, Rm 413 (on the 4<sup>th</sup> floor)

Directions to Emma Millon's office: The Psychology undergraduate office is on the ground floor of Tillett Hall. Near the office is a small elevator. Catch the elevator to the 4<sup>th</sup> floor. Look for room 413. (Note: if you're feeling fit, take the stairs next to the elevator)

Some information about office hours

Meetings can be subject to special arrangement, but only for exceptional circumstances, and will not take place after 4pm. Therefore, if a meeting is impossible, and it is critical, phone calls can be arranged. You can also talk to me after a lecture. Email correspondence is acceptable at any time (but I may not respond promptly – in some cases, it may take 24 hours, which is rare). Also note that questions which require extended email responses will necessitate a face-to-face meeting – so plan to see Emma or myself if you need detailed responses.

The goal of office hours is *clarification* – not a repeat of a missed lecture or large segments of a lecture. After exams, students concerned about their performance are urged to look at their scantrons. **DO THIS INITIALLY WITH EMMA.** My time is best used to provide you with clarification and additional information you may need to know – but if this relates to the exam, you first need to identify your problem areas. If Emma cannot explain why your answers are off base, she will ask you to see me. It will be your responsibility to contact me, if that is the case.

***PLEASE READ THE REST OF THIS SYLLABUS VERY CLOSELY.***

***Important 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. That's the way of it - and examples are abundant. In this course, we address one prominent instance of this particular rule. The consumption of chemical substances 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 dependence 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 to chemically 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.

**Specific Course Content:** At least 50% of lecture material focuses on the neurobiological and physiological effects of psychoactive drugs. I assume little major background in neuroscience (other than what was covered in Gen Psych 101), and tell you only what you need to know. The textbook provides a superficial introduction to the nervous system, which will help. My role is to expand on this information as it pertains to explaining why drugs do what they do, and to integrate this with the learning goals below.

### **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 (required):**

Drug Use and Abuse, 7<sup>th</sup> edition. S.A. Maisto, M. Galizio, G.J. Connors; Wadsworth Publishing

**Handouts** for the powerpoint lectures will be posted on sakai prior to class.

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

The textbook contains a chapter on the basics of the brain, and provides some details about the neurobiological effects of specific drugs. 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 speak up, or come to office hours to get clarification.

- (a) For the neuroscience novice: <http://thebrain.mcgill.ca/> (look at the top 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 into the mood)

**GROUND RULES (maintain decorum, and avoid my wrath) and Some Other Useful Information:**

- (i) **RECORDING.** *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) **LAPTOPS.** *Laptop use is allowed, but you must sit in the back rows and agree to shut it down if I request it. If you do not follow this rule, I will ask you to leave the class room. A student who must sit closer to the front, will be excepted. But a strong case needs to be made.*

*You should also note that in my classes laptops are a disadvantage. I am a heavy user of the black board and draw graphs and experimental designs. Best to print off the lecture slides, then use a pen. You will do so much better. Read on . . .*

This section is designed to help you. PLEASE READ.

There has been a flurry of concern in academia 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. To control for this, those who think a laptop is a "must" for them, will sit in the back rows of the lecture room.**

**NOTE-TAKING WITH LAPTOPS: not proven to be 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 near 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 (they did not use laptops, nor kept checking their smartphones – well, some might have . . . we will address this particular addiction). The data were objective: they simply did better. 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).

**ACTIVE LEARNING:** Film director Woody Allen once said: *80% 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 and organize what you have written (this is where the computer is your friend) – in doing this, you have already had your first study session. Moreover, you have relived the lecture before you have forgotten it (eg., try remembering lecture 2 by the time you get to lecture 7 or 8; in this course, the information piles up fast, and the topics change quickly – if you don't regularly review and organize your notes, it will be like shoveling snow in a blizzard). If you follow the above advice, you will get to the review material quickly and do an active mental replay, and in doing so, you are effectively preparing yourself for that big crunch time – the day 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 (still texting), 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. Needless, she stopped texting in class, and ultimately did well. Moral to the tale: **DON'T 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. *After all 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. 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 “put a sock in it” 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, respect those around you, listen to the lecture, and come out ahead. Why else are you here?

### **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., 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, 20% of total grade; Exam 2, 25% of total grade; Final Exam 30% of your total grade.

Assignments (25% of total grade: 15% for reading; 10% for documentaries)

The assignments will consist of the following.

- (i) Reading assigned chapters in the textbook and answering online quizzes based on the chapters – these quizzes will occur on average every 1–1.5 weeks;

- (ii) Viewing documentary films and answering online quizzes based on these films. You will be provided with probe questions in advance to allow you to know what information you need to listen/look for prior to the quiz on each documentary. The video assignments will be taken outside of class (by streaming video content via the library computers or off-campus). Discussion of the videos will be integrated into the basic lecture material, and provide a wider context to the more specific information learned in class.

Extra Credit. I will assign a chapter that we did not cover as assessment in the final. These questions will be extra credit questions, and will represent additional percentage points to be applied once you have earned the 100% from the exams and assignments. The amount to be applied will be determined at the time Exam 3 is administered.

### **Grading System**

There is no curving 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+ 86-89.9    B 78-85.9    C+ 74 -77.9    C 65 -73.9    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. Contact Emma Millon the TA as to when she can administer the makeup. A makeup can only be taken with my permission.**

After seeing the schedule below, if 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 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. The timing for introducing a topic may vary, and some weeks will have overflow material from the prior week. I may even skip certain sections, and if this happens, they will be delegated for extra credit reading. Nonetheless, the information will come thick and fast. Therefore, please read the chapters in the textbook before you attend class. Also, be warned that lecture material will also include quite a bit of material that is not in the book (which is why **attendance is important**). If I do not cover material in the book, it will be assessed separately through online quizzes that will be announced in class.

### Online Quizzes

Note that where it is stated that quizzes and other material are posted online, this refers to the Sakai course site. On the left side of the Sakai course site will be a link to Tests and Quizzes.

Dates and times for quizzes will be announced either by Emma or myself. These will be delivered using the 'announcements' tool on Sakai, as well as in class. The syllabus below provides some specific dates for the quizzes. If these change, you will be notified.

**Once a quiz is posted, you will have 24 hours to start and complete the quiz. Once you start a quiz, you cannot stop, log out and expect to come back to the quiz.** You must complete the quiz in the allotted time (which will typically be 40 minutes). Save your answers as you move along.

Please note that reports of technical trouble in taking a quiz (eg., browser not showing the quiz) needs to be reported to me or Emma immediately, and during the period when the quiz is active (eg., if the quiz is active 5pm on a given date, you have to report within that 24 hour period, before the quiz closes. There are no makeups for the quizzes except for reasons other than medical emergencies. You will be given several days (if not more) advance warning when the quiz is going live. Therefore, if there is going to be a problem, you have to notify me and I will decide if it is a legitimate complication.

### What you must do when you have a technical problem:

1. Firstly, if you suspect a poor connection wherever you live, go to the computer labs and/or terminals in the many libraries we have at Rutgers, NB. Any problems taking a quiz will very likely be addressed by the staff at the library. They are also witnesses to the problem.
2. If you do not see an active quiz displayed, take a screenshot of the browser page, after you have clicked on the 'Tests and Quizzes' link. Email this to myself or Emma. The screenshot should show your id in the top right corner, and there should be a time stamp. This you can enable by scrolling to the bottom of the browser page and clicking the arrow next to 'Server Time.' This will reveal the current time, and the screenshot should simultaneously show your ID and this time stamp.
3. Also email the screenshot and a report of your difficulty to [sakai@rutgers.edu](mailto:sakai@rutgers.edu) and make sure you explain the problem.

Typically, there are no problems. Moreover, I can log in as a student and see what you see. In addition, most browsers work. Chrome, Firefox, Safari, Explorer – they're all good. If there are problems with any of these browsers during the course (eg., when viewing videos), I will provide instructions to correct the problem.

***Week 1 (Thursday 1/18): Introduction and Overview of the Course***

Read chapters 1 and 2 in the textbook. A quiz on these chapters will be given online (on the Sakai course site). See Week 2 for the date of the quiz.

Introductory Opening: The classification of substance abuse disorders - Addiction and Dependence

***Week 2 (1/22, 1/25): Read Chapters 1 and 2 and take the quiz on Wednesday.***

The history of drug use: attitudes and legislation

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

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

Home Assignment: HBO Documentary: Addiction **Part I**. This will be provided through a link (Library eReserves). If this is not active by Week 2, the assignment will be reallocated to a different date. Questions for you to answer and discuss will be posted. A Quiz on what you learned will be posted online.

Book Quiz 1: Chapters 1 and 2. This will be posted online Friday 9AM. It will be available until Saturday 11PM. (note that subsequent quizzes will be live only 24 hours, and set to go live on a Wed at 5pm).

***Week 3 (1/29, 2/1): Chapter 3 (Drugs and the Nervous System); Chapters 4 (Pharmacology) & 5 (Psychopharmacology)***

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

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

Home Assignment: HBO Documentary: Addiction **Part II**. Probe questions for you to answer will be posted. A quiz on what you learned will be posted online.

Book Quiz 2: Chapter 3 Wed 5pm

***Week 4 (2/5; 2/8): Chapter 3 (Drugs and the Nervous System); Chapters 4 (Pharmacology) & 5 (Psychopharmacology)***

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

Book Quiz 3: Chapter 4 Wed 5 pm

**Week 5 (2/12, 2/15): Chapter 5 (Psychopharmacology)**

Finish material introduced in the previous week. Review relevant material for Exam 1.

Book Quiz 4: Chapter 5 Wed 5 pm

**Week 6 (2/19, 2/22): Legal Stimulants – Nicotine (chapter 7) and Caffeine (chapter 8)**

**EXAM 1: Monday 2/19 (this exam will cover all material up to and including Monday 2/15)**

**Thursday 2/22**: Begin 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!)

Home Assignment. Frontline Documentary: The Meth Epidemic.

Probe questions for you to answer will be posted. Quiz will be posted online.

Book Quiz 5: Chapter 8 Wed (2/21) 5pm

**Week 7 (2/26, 3/1) Legal Stimulants – Nicotine (chapter 7)**

*Continued from week 6*

Book Quiz 6: Chapter 7, Wed 5pm

**Week 8 (3/5, 3/8): Illegal Stimulants: Cocaine, Amphetamine and Methamphetamine (chapter 6)**

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 for drug use induces craving

**Week 9 (3/12, 3/15)                      *SPRING BREAK***

**Week 10 (3/19, 3/22) Illegal Stimulants Continued**

*Continued from Week 8*

Book Quiz 7: Chapter 6 Wed 5 pm

**Week 11 (3/26, 3/29) Alcohol (chapter 9)**

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

Book Quiz 8: Chapter 9 Wed 5pm

**Week 12 (4/2, 4/5): Opiates (Chapter 10)** 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

**EXAM 2 MONDAY 4/2 – Covers all material presented and assigned (i.e. reading) since Exam 1.**

**Thursday 4/5:** Begin Opiates

Two Home Assignments.

- (i) Frontline Documentary: *Chasing Heroin*. This is available through the 'Library eReserve' link on your sakai page or online at <http://www.pbs.org/wgbh/frontline/film/chasing-heroin/>
- (ii) *Heroin: Cape Cod, USA*. This is available only through the 'Library eReserve' link (those with HBO subscriptions can view this using their 'HBO go' or 'HBO now' apps)

Probe Questions for you to answer will be posted by Friday 4/6. The quiz will be posted Week 13.

**Week 13 (4/9, 4/12): Opiates continued**

*Online Quiz on documentaries viewed Week 12*

Book Quiz 9: Chapter 10 Wed 5pm

**Week 14 (4/16, 4/19) Marijuana (chapter 11)**

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

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

Book Quiz 10: Chapter 11 Wed 5pm

***Week 15 (4/23, 4/26) Hallucinogens - LSD; mushrooms; ecstasy (Chapter 12)***

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?

Home Assignment: *How Drugs Work: Episode 2 XTC* - This is available only through the 'Library eReserve' link. Probe questions will be posted and answers will need to be submitted via an online quiz.

Book Quiz 11: Chapter 12

***Week 16 (4/30) Review and complete outstanding material***

***FINAL EXAM: TBA***