*Fall 2022_Drugs and Human Behavior 830:360:01*
*Instructor: Alexander Kusnecov, Ph.D., Professor*

**SYLLABUS**
**830:360:01**

**DRUGS AND HUMAN BEHAVIOR Fall 2022**
**Course Index 09614**

**Class location and times**:
Scott Hall 135 (College Ave. Campus) Monday and Thursday 12:10-1:30

Mask Wearing: *Current University regulations are mandating that masks should be warn in class. Until I hear otherwise, you must abide by this rule.*

**Instructor**: Dr. Alexander Kusnecov, Busch Psychology Bldg Room 233a
kusnecov@psych.rutgers.edu
Office Hours: Friday 10-11 AM in Room 233a or by Zoom (during this time 10-11):
https://rutgers.zoom.us/j/97114723269?pwd=blh5ZHpDdnVCcHpuR1hNU21ZSnh3QT09

**Teaching Assistant**: Svetlana Bryant, MS
Department of Psychology, Busch Campus
sab493@scarletmail.rutgers.edu
Office Hours: Tuesday 10-11AM in Room 229 Psychology Bldg, Busch or by Zoom (during this time 10-11):
https://rutgers.zoom.us/j/94854672322?pwd=YnRKTXRLcGk0bll1T0tNTGpXQ001Zz09

**Office Hours:**
Both the Professor and Ms. Bryant have provided options for an in-person meeting or a zoom meeting. Students can decide on either when planning to attend office hours. While it is helpful to email ahead to let the Professor or Ms. Bryant know that you will be coming to office hours, the zoom link will be active during the time period indicated above and we will be in the offices listed above. We will notify you when we are available only by Zoom. Note that if you arrive at 11AM, you can still be seen. Arrivals after 11AM may not been seen if other students are already in attendance. If this happens, please email your question.

Although students may have other concerns or queries they wish to discuss, office hours serve two main purposes: (i) provide clarification of lecture material you did not understand, and (ii) review questions from an exam or quiz. The latter should be done with the TA prior to speaking with Dr. Kusnecov. Office hours will not be used to deliver large amounts of lecture material that should have been received in class.

## Course Synopsis

Human nature is fickle, curious, and abhors a vacuum. People thrive on novelty and creativity. The allure of new experiences satisfies basic characteristics of human behavior and is at the heart both of personal growth and self-destruction. In this course, we address one prominent instance of this particular rule – the allure of psychoactive substances. The consumption of chemical substances has long preoccupied humans due to the natural craving for pleasure and happiness, experimentation with conscious experience, and 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 all levels of social activity. Many reasons account for this, drawing on historical, sociological, biomedical and psychological perspectives. We will touch on these through a ***biopsychosocial*** approach. This involves learning about the neurobiological, behavioral and social factors that influence and are affected by 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 area is known as clinical 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 means, an approach referred to as clinical psychopharmacology

## Reading Material

**Textbook** (required): *Drug Use and Abuse*. 8th edition. S.A. Maisto, M. Galizio, G.J. Connors; Cengage Learning Publishers

**Note:** The online quizzes will be based on the 8th edition. DO NOT GET the 9th edition. The 7th Edition is fairly close to the 8th but can vary – purchase this at your own risk. The cheapest approach is to rent an e-book. You can rent from Barnes and Noble, Amazon or from Cengage (the publisher). There is also vitalsource (https://www.vitalsource.com/?utm_source=bookshelfonline&utm_medium=bookshelf ); whether you are using an iPad or computer, vitalsource offers a good experience.

**Handouts** of outlines for the powerpoint lectures will be posted as pdf files and can be printed in advance of class for note-taking. These handouts (which I will call 'Slide Sets') will be posted on Canvas in modules called 'Week 1', 'Week 2' etc.

I will also post some **additional reading material** (articles, sections of other books) so you have a deeper understanding of some topics that are not sufficiently covered in the textbook.

## Neuroscience links

Students that have not taken a neuroscience course or physiological psychology (830:313) and are a little stuck understanding some of the material may find the following links helpful. Of course, always contact me if you need clarification on material. Students new to neuroscience usually do well in the class, as I provide only what is needed to understand drug actions.

For the neuroscience novice this link is useful: http://thebrain.mcgill.ca/ Look at 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 and lectures.

On the science of addiction, the National Institute of Drug Abuse (NIDA) has useful publicly available information: http://www.drugabuse.gov/publications/science-addiction.

**Important health-related information about this course**

In a class based on drug use and the science underlying the information presented, there is always the risk that some people will experience (i) anxieties and concerns triggered by past and/or current experience, and/or (ii) the emergence of ideas that result in a reassessment of current and/or future use of physician-prescribed medication. Since this course began - many years ago - I have received a consistent stream of questions and concerns from students, some asking for advice, some wanting clarification, and some simply wanting to talk. This course is not prescriptive (telling you what you should do) nor is it proscriptive (telling you what you should not do – but obviously it is inherent in the nature of the course that you should not experiment with dangerous drugs). Given that this is academia, you learn about what has been studied and discovered, and what is still to be fully known. It does not mean that you should act on any of this information. As with anything you do in life, exercise commonsense and/or seek the advice of trained health professionals.

**Therefore, if you are on prescription medication, for whatever reason, you should not abandon use of your medication without consulting your physician. And if you are experiencing unpleasant feelings because of past drug abuse, the university has counseling centers that can assist with this. In fact, whatever personal health concerns a course triggers, please consult this website: http://health.rutgers.edu/**

**Assessment**

*Exams* (70% of total grade): There will be THREE multiple-choice exams. These exams will be given in our regular classroom. **Exam 1**: 20% of total grade; **Exam 2**: 25% of total grade; **Exam 3**: 25% of total grade. Exams will be based mostly on lecture material, as well as selected sections from the textbook.

*Quizzes* (30% of total grade): There will be 11 chapter quizzes and you will be allowed to drop your lowest two scores. This means your 30% for the chapter quizzes will be based on 9 quiz scores.

**Grading System**

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

Makeups**.** After seeing the schedule below, if you anticipate a conflict, you have the option of taking an exam LATER than the scheduled time. Legitimate reasons include Rutgers athletic obligations, religious events, documented medical conflicts (including sudden illness) and other (predetermined and fixed) events that cannot be changed and are supported by documentation. **It is up to you to anticipate the conflict now (aside from illness of course)** and let me know. These requests have to be unique and consistent with Rutgers rules for accepted exceptions.

**Academic Integrity and Class Behavior**

1. **Academic Integrity:** You are expected to maintain high levels of academic integrity and behavior in class and during assessments. Here is 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. When submitting work through an online mechanism (e.g., quizzes), 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. When submitting written assignments these will be screened for evidence of plagiarism. Go to this link http://academicintegrity.rutgers.edu/?s=plagiarism and access the information in the website given in the box titled: 'resources for students.'
2. Laptop use is allowed (but see study advice below and this link: http://www.newyorker.com/tech/elements/the-case-for-banning-laptops-in-the-classroom.
3. Respect your classmates:
    a. If you use laptops, DO NOT engage in anything that has nothing to do with the class. People beside you or behind you may be distracted by what is on your.
    b. DO NOT chit-chat for unreasonably long stretches of time with your neighbor/friend if that leads to a competition between other students trying to listen to me and trying to filter you out.
4. ***RECORDING.*** *Before you decide to record the lecture*, ASK ME.
5. **TURN OFF YOUR CELL PHONES** (or put them on vibrate). Definitely don't be distracted by getting into a texting cycle.

**STUDY ADVICE:** Maintain 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 modern technology and 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. If you follow the above advice, when it's time to prepare for an exam, you will get to the review material quickly making your life easier and less stressful during that big crunch time – the day before the scheduled exam.

## LECTURE AND ASSIGNMENT SCHEDULE

Please note this is the intended flow of topics to be covered each week. The timing for introducing a topic may vary. Quizzes will be given online through Canvas.

Important points about taking quizzes.

(i) The first quiz will be 80 minutes long, as it covers two chapters. Most others will be 40 mins.
(ii) If you logout before completing all questions, you will be scored only on those questions that you answered.
(iii) The chapter quizzes are always available to take for 12 hours (11AM-11PM). If you want your full allotted time, you need to start well before the end time (11PM). Canvas will cease delivering the quiz promptly at 11PM. If you have not finished all questions, that will be on you. For example, if for a 40 min quiz, start no later than 10:20 PM.
(iv) All questions will be multiple choice, with some simply having a choice between True or False.

(v) Once you answer a question you automatically move on to the next question. There is no opportunity to return to a previous question in order to change your response. Therefore, commit and move on.
(vi) All students will receive feedback regarding their score and correct/incorrect answers when the entire class has completed the quiz (typically the day after the quiz).
(vii) Any student who misses the quiz and successfully makes a plea for a makeup will need to answer different questions.

***Technical problems***
Please note that reports of technical trouble in taking a quiz (e.g., browser not showing the quiz) needs to be reported immediately. However, I should state that if you are logged into Canvas, then there is no reason not to see a quiz. That is, if the TA and myself can see it in student view then it is impossible for such a claim to be true. For example, if you are in Canvas using your particular browser (which should be Chrome, Firefox, Microsoft Edge, Safari), then your browser should not through some dark magic hide the quiz.

Always take a screen shot that contains your name on the Canvas page. Screenshots sent after the end of the quiz will not be accepted. You MUST login well before 11PM.

Problems logging in or having internet issues are legitimate. I will take this concern seriously. If they recur to the extent that you are indefinitely delayed, you will receive a temporary grade when the course is completed, so that new questions can be formulated to ensure academic integrity. I will deal with all of this on a case-by-case basis.

At times Canvas or human error result in quiz settings that prevent it from being seen. If this happens we will fix this and reset the end time to the next day (e.g., if we notice such a problem, the Quiz will be extended to end 11AM the next day).

## Weekly Schedule of Topics and Expectations

Our "week" will begin on a Monday (although Week 1 begins Thursday 9/8). Lecture material will come to you as handouts consisting of lecture slides converted into a pdf format.

***Week 1 (9/8): Overview of the Course and Some Definitions***

Your Goals: Read Chapters 1 and 2 (Quiz 1 on Wed will be on these Chapters)

***Week 2 (9/12): The nervous system; Chapter 3 (Drugs and the Nervous System)***
Overview of The Nervous System: Neuroanatomy; Neurons and their organization in the brain; electrophysiological terms associated with how neurons work.

Your Goals:
- Read Chapter 3 (Drugs and the Nervous System)
- Take Quiz 1: Wed (9/14) 11AM -11PM. This quiz is on Chapters 1 and 2. Available for 12hrs.

***Week 3 (9/19): Pharmacological Principles and Psychopharmacology***
This week we will cover basic psychopharmacology, which essentially is the study of how neurons communicate with each other chemically and what this means for behavior. Chapter 3 provided all the basic information on neurotransmitters and receptors. And we will refer back to this. However, we will also need to cover some basic concepts of pharmacology (e.g., dose-response relationships, tolerance, pharmacokinetics).

Your Goals:

- Read Chapter 4 (Pharmacology) & Chapter 5 (Psychopharmacology)
- Take Quiz 2 on Chapter 3 *(40 minutes allocated)*. Available Wed (9/21) from 11AM to 11 PM.

***Week 4 (9/26): The nature of pleasure and reward***

The brain reward system, the concept of pleasure pathways in the brain, experimental paradigms for testing drug use in animals.

Your Goals:

- Take Quiz 3 on Chapter 4 (40 mins available). This is available Wed (9/28) 11AM-11PM.
- Read articles: *The Joyful Mind* and an excerpt from '*The Compass of Pleasure*' by David Linden. These readings discuss the techniques that revealed so-called pleasure areas in the brain, as well as the ethical violations of this research. The Joyful Mind focuses on whether we actually have "pleasure areas" or whether we have areas that increase our drive for certain stimuli.

***Week 5 (10/3): Finish Reward/Pleasure;* Exam 1**

Your Goals

- Review lecture material and reading notes
- Take Quiz 4 on Chapter 5 on Monday (10/3) 11AM-11PM.
- **EXAM 1** (20% of total grade) on Thursday (10/6). Regular class time 12:10-1:30.

***Week 6 (10/10): Legal Stimulants – Nicotine (chapter 7) and Caffeine (chapter 8)***

These stimulants are not controlled (i.e. they are legal). One is a powerful addictive agent and responsible for chaining the behavior of an individual to an unhealthy and ultimately longevity-reducing practice: tobacco use. The other is found in all sorts of beverages, most commonly coffee and tea. It was once reviled as unhealthy. More recently, it has been associated with improved health outcomes. As with other drugs we discuss, we look at the 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 (that can promote cognitive enhancement) and any pathological or beneficial health outcomes.

Your Goals:

- Take Quiz 5 on chapter 7 (Nicotine; 40 minutes allocated) Wed (10/12) 11AM-11PM.

***Week 7 (10/17) Illegal Stimulants: Cocaine and Methamphetamine (*Chapter 6)**

These stimulants are controlled, which means they are subject to federal and state regulation regarding their manufacture, dispensation and use. We will look at the neural mechanisms for their effects and their addictive properties, immediate and long-term effects on brain plasticity, and health outcomes. Amphetamine-based medications are used to treat attention and hyperactivity disorders, leading to the question: how does a powerful stimulant steady the mind?

Your Goals:

- Take Quiz 6 on Chapter 8 (Caffeine: 40 minutes allocated): Wed (10/19) 11AM-11PM.

***Week 8 (10/24): Stress and Relapse***

Relapse is the biggest problem encountered when treating people for addiction. We will discuss the neurobiology of stress and how it contributes to craving and relapse. We will examine how an increased anxiety-like state can emerge from drug abuse and result in heightened sensitivity to a variety of stressors.

Moreover, a depressed-like state can develop which perpetuates heightened anxiety and susceptibility to stressors. A key theory that might explain some of these effects is the opponent-process theory.

Your Goals:

- Take Quiz 7 on Chapter 6 (Cocaine/Methamphetamine: 40 minutes): Wed (10/26) 11AM-11PM.

***Week 9 (10/31)* Alcohol *(Chapter 9); Opiates/Opioids (Chapter 10)***

Origin; neurobiological effects; behavioral symptoms; basis for dependence; pathology and impact on society and the individual. We will also look at the neurobiology of opioid systems in the brain - a natural mechanism for pain reduction - and the clinical uses of opioids. Other topics will include heroin trafficking and the opioid addiction epidemic of the 21st century.

Your Goals:

- Read Chapters 9 and 10.
- Take Quiz 8 on Chapter 9 (Alcohol: 40 minutes allocated): Wed (11/2) 11AM-11PM.

***Week 10 (11/7): Continue Opiates/Opioids (chapter 10);* EXAM 2 (11/10)**

Your Goals:

- Study for Exam 2: material on legal (nicotine/caffeine) and illegal (cocaine/meth) stimulants, stress and relapse, and alcohol. Both lecture material and select pages of the textbook will be tested.
- EXAM 2 (25% of total grade): Thursday 11/10 (12:10 -1:30)**.** This will cover all material up to and including Alcohol.

**Week 11 (11/14):** ***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.

Your Goals:

- Take Quiz 9 on Chapter 10 (opiates; 40 minutes allocated) on Wed (11/16) 11AM-11PM.

***Week 12 (two consecutive days this week: 11/21, 11/22; change in designation Thur = Tue, due to Thanksgiving)***

This week we will finish Marijuana. If we do this on Monday, there will be no class on Tuesday.

Your Goal:

- Take Quiz 10 on Chapter 11 (Marijuana), Monday (11/21) 11AM-11PM.

***Week 13 (11/28): Hallucinogens (Chapter 12)***

Hallucinogens fall into the category of psychedelic drugs. Here you will find a drug called ecstasy which is not like LSD, but nonetheless is incorporated into the hallucinogen basket. The psychedelic drugs have received a lot of press lately as they have been promoted as potentially therapeutic agents.

Your Goals:

- Read Chapter 12
- Take Quiz 11 on Chapter 12 (Hallucinogens), Wed (1/30) 11AM-11PM.

***Week 14 (12/5): Psychiatric Medications (Chapter 13)***

We will review three primary psychiatric or mental health problems: anxiety disorder, depression and schizophrenia. We have mentioned elements of these disorders all throughout the course, but issues of mood, anxiety and psychosis can stand alone and separate from their appearance due to illicit drug use. Medications and the basis of their actions will be reviewed.

Your Goals:

- Read Chapter 13
- Take Quiz 12 on Chapter 13 (Psychiatric Medications), Wed (12/7) 11AM-11PM.

***Week 15 (12/12): Review material and prepare for Exam 3 (25% of total grade)***

The Final Exam (Exam 3) is on 12/22, 12-3PM. This exam will only cover opiates/opioids, marijuana, hallucinogens and psychiatric medications. In addition to the lecture material, select pages from the textbook will be tested.