**Neuropharmacology of Addiction**

**NROSCI 1200/2200**

**(28192/28193)**

**Fall Term 2018 (2191)**

**Instructor**:

Debra Artim, Ph.D.

Department of Neuroscience

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Office hours: Tuesday 11AM – 12:30 PM; Wednesday 1:30PM– 3PM, Friday 1PM – 2:30 PM or by appointment. If you are unavailable during regular office hours, please feel free to make an appointment. The best way to make an appointment is via e-mail.

**Lecture:** Monday and Wednesday, 4:30 – 5:45 PM, A221 Langley Hall

**Textbook: No required textbook.**

We will not be following a specific textbook in this course. Lecture material and assigned readings will be available on CourseWeb. Additionally, we will have guest lecturer(s) who will give talks on their area(s) of expertise. Therefore, students are strongly encouraged to attend class and take good notes. Students should consider all power point lecture slides, handouts and assigned readings as essential.

**Course website:** [courseweb.pitt.edu](https://courseweb.pitt.edu/) Check here for announcements, handouts, grades, and useful links. Lecture notes / power point slides will generally be posted on the class CourseWeb site a day or 2 before lecture. \*Please check courseweb frequently for links to videos, copies of class handouts, announcements regarding class, links to supplemental readings / info, and other opportunities (such as any fellowships, research positions I may have to pass on.)

Only critical and time-sensitive announcements (such as weather-related class cancellation) will be e-mailed directly to your pitt address as well as be posted on courseweb

**Course Description:**

This course is designed to provide an overview of the biological basis of addiction and the neuropharmacology of drugs of abuse and dependence, including basic principles of drug action as well as comprehensive coverage of the major classes of drugs (opioids, stimulants, nicotine, alcohol, sedatives, cannabis, hallucinogens). Students will study mechanisms of action, effects, pharmacokinetics as well as tolerance and dependence for each of these drugs/drug classes. The reasons for addiction including biological, genetic, cultural and other determinants will be discussed. Students will learn about laboratory-based methods used in addiction research, common pharmacotherapies used to manage alcohol and drug addiction, and consider public health issues associated with addiction.

**Course Objectives:**

Upon completion of the course students should:

* Master the basics of pharmacology and understand the biochemical, physiological and neural pathways of drug actions in the brain.
* Understand the neural mechanisms of addiction and withdrawal of psychoactive drugs, and the therapeutic actions of major psychiatric drugs in the brain.
* Critically analyze and evaluate papers from the neuropharmacology literature.
* Design research plans utilizing modern neurobiological techniques to test hypotheses in neuropharmacology.

**Exams, Assignments and Grading:**

Exams

There will be three exams, each worth 100 points. These exams consist of objective, short answer and short essay questions; you will be asked to use information learned to evaluate issues or defend principles and to design experiments to test various hypotheses. If you must miss an exam you must make arrangements with Dr. Artim **ahead of time** or else provide a doctor’s note; **you must provide official documentation** in order to make up an exam.

**Exam dates:**

Exam 1: Wednesday, Sept. 26th

Exam 2: Wednesday, Oct. 31st

Exam 3: Wednesday, Dec. 12 (12 – 1:50 PM) **\*\*\* Please note that exam 3 takes place during finals week, but covers only the material from the third unit of the course\*\*\***

Primary literature / assigned reading and quizzes

As Neuropharmacology of Addiction is an advanced neuroscience elective, an important component of the class is to read examples of developmental research in the primary literature. Students will be assigned six papers to read (two during each ‘unit’ of the course) and will take a short “quiz” on courseweb covering each paper. The quizzes will be due before class on the indicated due dates and this will be followed by class discussion of the paper. Reprint quizzes will account for 10% of your overall grade. Finally, the content of the papers and their evaluation is material that will be covered on the exams.

Class participation

It is my goal, to make the course as interactive as possible (a challenge with 90 students, but still my goal!) Thus, there will be videos, handout / worksheets, small group and large group discussions. Participation in these in-class activities is not officially a part of your grade. Why? You are adults and I am not going to micro-manage your time. Also, I have ~500 students and don’t have the time to keep track of all of you! HOWEVER, I strongly encourage you to come to class as often as possible. The contribution of all students makes the class more satisfying and, I think, interesting. Plus, anything covered in class is fair game on exams!

Final grade:

Exam 1 = 30%

Exam 2 = 30%

Exam 3 = 30%

Primary literature quizzes = 10%

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| **Grading Scale** | | | | |
| Letter Grade | Percentage Range |  | Letter Grade | Percentage Range |
| A+ | 98.0-100 |  | C+ | 78.0-79.9 |
| A | 93.0-97.9 |  | C | 72.0-77.9 |
| A- | 90.0-91.9 |  | C- | 70.0-71.9 |
| B+ | 88.0-89.9 |  | D | 60.0-69.9 |
| B | 82.0-87.9 |  | F | Below 60 |
| B- | 80.0-81.9 |  |  |  |

**OMET evaluations:** Towards the end of the semester, you will receive an e-mail asking you to complete an evaluation of the course and of the instructor. I take these seriously as they are instrumental in organizing and improving the course and in learning how best to present the material. **\*If\*** on the last day of class (Friday, December 7th) at least 95% of students in the course have completed the OMET evaluation, I will add 0.5% to each student’s overall grade.

**Graduate students:**

Those registering for the graduate course (PITT 2200) have several options with which they can fulfill the graduate-level component of the course. Please see Dr. Artim early in the semester to discuss these options.

**Disability Resource Services**

*If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890, as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.*

**Academic Integrity Policy**

*Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, noted below, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz, exam or paper will be imposed. (For the full Academic Integrity policy, go to* [*www.provost.pitt.edu/info/ai1.html*](http://www.provost.pitt.edu/info/ai1.html)*.)*

**E-mail Communication Policy**

*Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to* [*http://accounts.pitt.edu*](http://accounts.pitt.edu)*, log into your account, click on* ***Edit Forwarding Addresses****, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to* [*www.bc.pitt.edu/policies/policy/09/09-10-01.html*](http://www.bc.pitt.edu/policies/policy/09/09-10-01.html)*.)*

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**Course Schedule**

**Date Topic**

Aug. 27 Introduction – in class survey of opinions regarding drug use, abuse and

treatment.

Aug. 29 Review of neuroanatomy / neurophysiology

**Sept. 3 No Class – Labor Day**

Sept. 5 Chemical signaling: neurotransmitters

Sept. 10 Pharmacokinetics / principles of pharmacology

**Quiz 1 due**

Sept. 12 Tolerance, dependence and withdrawal

Sept. 17 Animal models of addiction (Dr. Bertholomey, guest speaker)

Sept. 19 Current models of addiction: reward pathway

Sept. 24 Subjective aspects of drug use: craving and intoxication

**Quiz 2 due**

Sept. 26 **EXAM 1**

Oct. 1 Stimulants; cocaine and amphetamine

Oct. 3 Guest speaker: Dr. Dong

**Oct. 8** Stimulants – part 2

**Oct. 10** Other stimulants: nicotine and caffeine

**Quiz 3 due**

Oct. 15 **NO CLASS - Fall Break**

Oct. 16 **Monday classes meet** - Alcohol – history, pharmacology and

psychology

Oct. 17 Alcoholism – factors and treatment

Oct. 22 Opioids & pain management

Oct. 24 Opioids: addiction and treatments

**Quiz 4 due**

Oct. 29 The opioid epidemic

**Oct. 31** **EXAM 2**

Nov. 5 Marijuana – the details

Nov. 7 Marijuana – should it be legal?

Nov. 12 Psychedelics – not the usual high

Nov. 14 Sedative-Hypnotic and Anxiolytic Drugs

**Quiz 5 due**

Nov. 19 Inhalants & GHB

Nov. 21 **NO CLASS (Thanksgiving break)**

Nov. 26 Pharmacological and non-pharmacological treatment of drug abuse and

addiction

**Nov. 28** Current drug policy / advocacy in addiction

**Quiz 6 due**

Dec. 4 Behavioral addictions – is this a real thing?

Dec. 6 So…how can we solve this problem? **(TBD)**

**Dec 12 (Wednesday) 12 – 1:50 PM Exam 3 (note that exam 3 is during finals week)**

***\*\*\*The exam dates (including the date of the final exam) are firm!! If we get ahead, or behind in material, it will not change the dates of the exams, although it may change what material is covered on that exam. I will always announce and be clear about what information is covered on each exam***