

**DRUGS AND THE BRAIN
MCB 62 / L&S 30 / PSY 119**

**Department of Molecular and Cell Biology
College of Letters and Sciences
Department of Psychology**

University of California, Berkeley - Fall Semester 2010

Nowhere are the connections between chemistry, cell biology, physiology, botany, psychology, sociology, public policy, and constitutional law more vividly illustrated than in understanding the effects of drugs on the human brain and human behavior. This course will deal with just that: the biology, chemistry, psychology, and sociology of psychoactive drugs. Such substances - which include stimulants, sedatives, psychedelics, analgesics, antidepressants and antipsychotic pharmaceuticals, and others - have powerful effects on the human brain, behavior, and mental function. The origins of drugs as components of plants that have enjoyed deep historical relationships with humankind will be emphasized.

Two Required Lectures and one Required Discussion Section meeting each week.

Lecture times: Tuesday and Thursday at 3:30 - 5:00 pm - Wheeler Auditorium

Instructor: David Presti 249 Life Sciences Addition (LSA)
phone and voicemail: 643 2111 <presti@berkeley.edu>

Office hours: Tue 1:00-1:30 pm, Wed 11:00-11:30 am, Thu 11:00 am-11:30 in 249 LSA.
I will also be available after each lecture for questions and discussion.

Website: <http://mcb.berkeley.edu/courses/mcb62/>
bSpace website will also be implemented

Required texts: Course Reader at Copy Central, 2560 Bancroft Way
Pharmako/Poeia by Dale Pendell North Atlantic Books (1995)
Pharmako/Dynamis by Dale Pendell North Atlantic Books (2002)

Optional text: *Pharmako/Gnosis* by Dale Pendell North Atlantic Books (2006)

Concerning the texts and course reader: The *Pharmako* trilogy addresses the topic of psychoactive drugs via chemistry, botany, psychology, history, and, significantly, poetry. The author, Dale Pendell, is an outstanding poet and a very knowledgeable ethnobotanist. Reading these books will give you a perspective on psychoactive drugs unlike any other material written on these subjects. The books have recently (2009) been republished by North Atlantic Books in Berkeley. The current editions have beautiful hardcover binding. The older paperbound editions, published by Mercury House, contain identical material. The course reader contains detailed instructions for the homework assignments, guidelines for writing the term paper, and a number of interesting and important readings. Be sure to get the current Fall 2010 version of the reader, as readers from this class from other years contain different material. Copies of all the textbooks (but not the reader) are available on 2-hour reserve in the Moffitt Undergraduate Library.

Graduate student instructors and their email addresses:

Ankur Singhal	<aksinghal_aks@berkeley.edu>
Anna Sapozhnikova	<annasapo@berkeley.edu>
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The GSIs are here to help you get the most from this class. You are encouraged to get to know and talk with your GSI. Your GSI will see you in weekly Discussion Section and will also be available to meet with you during weekly office hours. Don't be shy!

Discussion section times and locations:

101	Mon	9-10	122 Wheeler	Ben
102	Tue	1-2	109 Morgan	Mark
103	Wed	1-2	123 Wheeler	David
104	Wed	3-4	123 Wheeler	Natalia
105	Wed	2-3	223 Dwinelle	Ankur
106	Mon	1-2	123 Wheeler	Anna
108	Wed	9-10	122 Wheeler	Ben
109	Thu	1-2	30 Wheeler	Stephanie
110	Fri	3-4	130 Wheeler	Natalia
111	Fri	10-11	107 GPB	David
112	Mon	3-4	123 Wheeler	Helene
113	Mon	4-5	30 Wheeler	Anna
114	Fri	1-2	123 Wheeler	Ben
116	Wed	12-1	122 Wheeler	Helene
117	Thu	11-12	109 Morgan	Stephanie
119	Mon	2-3	122 Wheeler	Natalia
120	Tue	1-2	110 Wheeler	Ankur
121	Wed	12-1	123 Wheeler	David
122	Wed	1-2	130 Wheeler	Ankur
123	Wed	2-3	122 Wheeler	Anna
124	Wed	4-5	30 Wheeler	Stephanie
125	Thu	1-2	110 Wheeler	Mark
126	Tue	12-1	107 GPB	Mark

Prerequisites: A passion to learn! There are no University course prerequisites for MCB 62 or L&S 30. Both non-science and science majors are encouraged to enroll, as the course has its foundations in both conventional science and in poetry. In PSY 119, you will be writing a term paper drawing from readings you locate in the primary scientific literature. In order to have the background to read and understand this literature, for PSY 119 there is a prerequisite of upper-division Biological Psychology (PSY 110) or equivalent course.

Attendance at the lectures and in discussion section is required. Lectures are every Tuesday and Thursday, 3:30 to 5:00 PM. While the factual content in the course can be learned by reading and obtaining notes from the lectures, attendance is required because we believe there are very important elements of the material that are best, if not exclusively, transmitted through in-person contact. Basically, there is more to learning than memorizing facts, even if memorizing some facts is important and is also part of what needs to be done in order to pass the exams.

Attendance will be monitored with periodic surprise quizzes during lecture. The quizzes will be very short, consisting of a small number of questions. They will test material from recent lectures and reading. To be prepared to take the quizzes, stay current with your understanding of lecture and reading material. Always bring to class copies of the quiz answer form, printed from the course website (backup copies in the course reader). Also bring a pen or pencil with which to fill out your quiz answer form. We will not be supplying quiz answer forms or writing implements at the time of the quizzes.

Excused absences: There may be times when it is necessary for you to miss a lecture. To be excused, send a carefully-formatted email to your GSI **prior** to the missed lecture. The subject line of the email must have exactly the following format:

Your Last Name, Your First Name, Day of Month to be Excused, Month

The text of your email should be your reason for missing lecture. If there was some reason you could not send the email prior to lecture, then send it afterwards and include an explanation for the lateness. Don't make up excuses for absences; if you do and we find out, you will receive an "F" in the course. By this point in life, everyone ought to know the importance of honesty.

If you have more than two unexcused absences from lectures, your grade in the course will be lowered by as much as one letter grade. In addition, if you are frequently requesting excused absences you will be asked to meet with us and explain what is going on. Bottom line: don't register for the class if you don't intend to come to lectures. We believe the lectures to be important.

Grading: Your grade in the class is based on exam performance (three midterm exams) (~ 75-80% of your grade) and discussion section assignments (~ 20-25% of your grade). The discussion-section assignment portion of your grade comes from 4 written homework assignments, participation in oral-group debates, and a term paper (5 pages for MCB 62 and L&S 30; 10-15 pages for PSY 119). For one of the debates you will be graded on your participation as part of a debate team; for the other two debates you will be graded on participation in the class discussion. The exact % contributions of the various exams, quizzes, and assignments will be determined at the end of the semester. I no longer indicate the exact % contributions of the grade components at the beginning of the semester because I wish to discourage the running computation of points and accompanying preoccupation with how well one is doing in the class. The GSIs and I do not wish to hear questions of the form: "how well do I need to do on the last midterm exam in order to get an 'A' in the class?" Our answer to any questions of this sort will always be: do as well as you can on all exams and assignments! The task is to enjoy learning the material; the assignments and exams will hopefully assist with this.

If you are taking this class for a letter grade, you cannot earn better than a "C-" grade without receiving credit for all four of the homework assignments, participating in the debate, and turning in an acceptable term paper. If you are taking this class pass/not-pass, you must turn in all of the homework, participate in the debate, and turn in an acceptable term paper in order to pass the class.

Homework:

- detailed instructions for the homework assignments are in the course reader
- Homework One is a description and analysis of an article that you find from the news media
 - due in discussion section the week of **September 6-10**
- Homework Two is about plant rituals in your life
 - due in discussion section the week of **September 13-17**
- Homework Three is an annotated bibliography of reference material for your term paper
 - due in discussion section the week of **October 18-22**
- Homework Four is on the writing of exam questions
 - due in discussion section the week of **November 1-5**
- **Homework assignments must be turned in as paper copy. Emailed assignments will not be accepted.**
- Assignments turned in up to one week after the due date will receive half-credit. Assignments turned in 1-2 weeks after the due date will receive zero points but will be credited as being turned in. Assignments received more than 2 weeks late may not be accepted. Note that this becomes a serious matter, since, as stated above, you need to receive credit for all four of the homework assignments in order to receive better than a C- grade (for a letter grade) or a passing grade (for a P/NP grade). Thus, be sure to complete your homework on time. This is not an arbitrary rule, but is done to encourage completion of the homework in the way that we believe to be most useful.
- Homework assignments are meant to be interesting, informative, and enjoyable!

Term Paper:

- detailed instructions for the term paper are in the course reader
- your term paper must be submitted as both a paper copy and an electronic version
- the paper copy of your term paper must be in your GSI's hands by **Friday November 12** at 4 pm
- Your term paper may be turned in prior to this deadline and we encourage you to do so. A good time would be during discussion section prior to the due date. You may also turn the paper in during lecture on Tuesday November 9. (Note that there are no class meetings on November 11.) We suggest that you use this assignment as an opportunity to not wait until the last minute.
- The due date for electronic submission of your term paper at <www.turnitin.com> is midnight on Friday November 12. Note that the electronic submission is in addition to the paper copy turned in to your GSI.
- instructions for electronic submission will be provided in class
- The term paper is meant to be a fun assignment - an opportunity to learn more about a topic that you find particularly interesting. Hopefully there will be many such topics!

Debates:

- there will be three debates conducted in discussion section, with one-third of the class involved in each of the debates
- the first debate will be during the week **October 4-8** the second will be during the week **October 11-15**, and the third will be during the week of **November 15-19**
- debate guidelines are in the course reader
- debate topics will be announced in class
- we do our best to choose topics that will make for very interesting debates, where strong arguments can be made for both sides of the issue
- if ideas occur to you that would be interesting to consider as a debate topic, please let us know

Exams will consist of multiple choice and short answer questions. Each midterm exam covers the preceding portion of the course and draws from material in lectures, discussion sections, and required readings. A sampling of questions from past exams is contained in the course reader.

- Midterm Exam One is on **Tuesday September 28** at 3:30 - 5:00 pm in Wheeler Auditorium
 - Midterm Exam Two is on **Tuesday October 26** at 3:30 - 5:00 pm in Wheeler Auditorium
 - Midterm Exam Three is on **Thursday December 2** at 3:30 - 5:00 pm in Wheeler Auditorium
- There will NOT be a cumulative final exam in this class.**
- we cannot change the days and times for these exams; mark your calendars now
 - preparatory review sessions will be held at a time and place to be announced prior to each exam
 - there will be no make-up exams
 - if you miss an exam, you will receive zero points for that exam
 - if you miss one of the first two midterm exams with a credible excuse (e.g., significant medical problem documented with verifiable documentation), then your other exams will count proportionally more in determining your course grade
 - if you miss the third midterm exam with a credible excuse, you will receive an incomplete (I) grade for the course (provided you have passing status in the class prior to the exam, otherwise grade = F); you will need to resolve the incomplete grade by taking a special exam

More on Grading: Your letter grade in the course will be determined according to absolute standards of performance. This hopefully relates to your acquisition of knowledge and understanding of the material. Importantly, you will not be competing against fellow students in the sense that we do not force letter grades to conform to a predetermined distribution. If everyone does extremely well, everyone could receive an "A" grade. If everyone does poorly (highly unlikely), then everyone could get a low grade. Rather than devoting energy to worrying about where grade cut-offs are, if you are truly interested in this subject and in getting the most from this class, we urge you to study seriously from the beginning, do the readings, and truly make an effort to learn the material. You will be rewarded with deep knowledge and understanding of some really fascinating topics. Good grades will be a natural side effect.

In past years the percentage of students earning an "A" or a "B" in this class has been between 65 and 70%. Thus, the majority of students do well in this class. However, in order to do well in the class you do have to learn a bunch of stuff. It is also easy to get a "C" or even lower grade in the class, if you don't put in sufficient effort.

Do not make the mistake of not keeping up with the material and then trying to negotiate a last-minute deal to improve your grade. In the reader there are some examples of desperate emails I have received in past years. It is very sad. We recommend that you not get yourself into the position of needing to write such emails. We do not offer extra credit or make other arrangements to boost grades. If you want a good grade, you must learn the course material in a timely manner. It's as simple as that.

Cheating: Anyone caught cheating on a quiz or exam will receive an "F" in the course and will also be reported to the University Office of Student Conduct. In past years, there have been situations in which students failed the class for talking to one another during an exam. In order to guarantee that you are not suspected of cheating, please keep your eyes on your own materials and do not converse with others during the quizzes and exams.

Plagiarism: Your homework and term paper must be original writing composed by you. To copy text or ideas from another source without appropriate reference is plagiarism and will result in a failing grade for your assignment and perhaps further disciplinary action. The originality of your term paper will be checked by comparing it to the entire worldwide web and additional databases of written material (see www.turnitin.com for more information on this process).

Communication and emails: We like teaching this class! The material is fascinating and, we believe, important stuff to know about in the contemporary world. I enjoy being available during office hours and after lectures to answer questions and further discuss the material. I prefer in-person contact to email. That doesn't mean that I won't respond to email, but sometimes my email inbox gets overloaded and I may not respond. **Always make sure to see me in person about any important matter.**

We have tried to make this syllabus very complete. The detailed exposition of policies and procedures is presented for completeness. We do not mean to frighten you away from this class by speaking to things like attendance requirements, quizzes, penalties for late assignments, consequences of cheating, and so forth. If you are truly interested in this subject material and bring to the class a passion for learning, it is likely that none of this will even be relevant to you. The material in this class is truly very interesting and the majority of students do well and enjoy the class immensely. May it be so for you!

- University holidays

- no discussion sections or lectures on these days

 - September 6 - Labor Day, remember and honor the workers of the world

 - November 11 - Veteran's Day, remember and honor the military veterans of the world

 - November 25 - Thanksgiving Day, give thanks

 - November 26 - day after Thanksgiving Day, continue giving thanks

- Important astronomical dates and days of ancient ritual

 - New Moons: September 8, October 7, November 5, December 5

 - Full Moons: August 24, September 23, October 22, November 21, December 21

 - Autumn Equinox: September 22

 - Halloween / Samhain: October 31

 - Winter Solstice: December 21

- reference for lunar and solar information

 - "Astronomical Applications Department of the US Naval Observatory"

 - <www.usno.navy.mil/USNO/astronomical-applications>

Move forward with alchemy . . .

• approximate course timeline of topics with associated readings from the Course Reader

Week 1:	26-27 Aug	Course logistics and overview. Drugs, poisons, plant medicines, allies, curanderos, abuse, addiction. (Readings 1,2,3,4,5,6,7,8,9)
Week 2:	30 Aug - 3 Sept	How drugs enter the body and the brain. Nervous system, brain, cells, molecules, membranes. (Readings 9,10,11,12,13,14,15)
Week 3:	6-10 Sept	Neurons, synapse, neurotransmitters, receptors, pharmacology, autonomic nervous system, alkaloids, hallucinogenic solanaceous plants. (Readings 15,16,17,18)
Week 4:	13-17 Sept	Tobacco and nicotine. (Reading 19)
Week 5:	20-24 Sept	Alcoholic beverages, distillation, sedative-hypnotics, inhalants, general anesthetics.
Week 6:	27 Sept - 1 Oct	Absinthe, essential oils, spices. Midterm Exam One on Tuesday Sept 28.
Week 7:	4-8 Oct	Psychiatric conditions and medications. Clinical trials. Controlled substances and schedules. (Readings 20,21,22) Debate One in discussion section.
Week 8:	11-15 Oct	Cannabis. Opium, opioids, and endorphins. (Readings 23,24,25) Debate Two in discussion section.
Week 9:	18-22 Oct	Coffee, tea, caffeine, cacao, chocolate, yerba mate.
Week 10:	25-29 Oct	Ephedra, khat, amphetamine. (Reading 26) Midterm Exam Two on Tuesday October 26.
Week 11:	1-5 Nov	Coca and cocaine. (Readings 27,28)
Week 12:	8-12 Nov	Addiction and treatment. (Reading 29) Term Paper due on Friday November 12.
Week 13:	15-19 Nov	Psychedelics, LSD. (Readings 30,31) Debate Three in discussion section.
Week 14:	22-24 Nov	Magic mushrooms, psilocybin, DMT, ayahuasca, peyote, mescaline. (Readings 30,31)
Week 15:	29 Nov - 3 Dec	Nitrous oxide. Brain and mind. (Readings 32,33) Midterm Exam Three on Thursday December 2.