Psychoactive drugs are substances that alter mood, consciousness, and/or behavior, which they accomplish by modifying existing pathways in the brain. Most commonly, psychoactive drugs alter the processes involved in the synaptic transmission of neurotransmitters. In this course we will examine the major neurotransmitters systems of mammalian brains, discussing the pharmacology of each system, and the role of each in normal and abnormal behavior.

I will attempt to make this course relevant to both basic researchers and clinicians, and will be careful to assign articles and promote discussions that interest both groups. Although this course will be grounded in behavioral neuroscience, I invite constructive feedback/advice from students about how to make the course more relevant to clinicians. Please feel free to talk about the course with me throughout the semester.

Each week, the first part of class may be devoted to some lecture. I hope that students will feel free to interrupt me during lectures to clarify important points or perhaps discuss certain topics in greater detail. There will be several readings assigned weekly. The second part of each class will be devoted to the discussion of these readings.

I expect that each of us will adhere to the UVM classroom code of conduct. Please silence all cell-phones and other electronic devices. Please do not use devices in class that may be disruptive to others.

Required Text:
There will be no required text for this course. Required readings will be posted on Blackboard.

Grading:

Participation (30%)
- You will be expected to attend each class, and participate in discussions both during lectures and our discussion of the weekly readings (15% of your grade).
- There may also be weekly assignments post on Blackboard that will be included in your participation grade (15% of your grade).

Led Discussion (20%)
- On the first day of class we will pass around a signup sheet, which I will post on Blackboard. Groups will lead discussions on the listed weeks (bigger groups will be responsible for covering more weeks).
- For each week that your group is responsible for, one member of the group must submit to me (via email) two empirical articles that relate to that week's topic, as well as at least two discussion questions. Your group may divvy up the responsibilities (choosing articles, creating discussion questions/ leading discussions in class) however you wish, but each group member must have a noticeable role in the classroom discussion for at least one of the weeks that the group is responsible.
- These items must be submitted to me before the start of class ONE WEEK PRIOR to the class in which materials will be discussed.
(I will also be assigning 1-2 review articles each week. All of these will be posted on Blackboard.)

**Review Paper (30%)**
Each student will be responsible for writing a 10-20 page review paper on a topic related to this course. We will discuss the writing of this paper in class. You will be required to hand in at least one draft prior to the final paper, but I am willing to look at multiple drafts. I will allow some flexibility regarding the topic, but I must approve it beforehand.

**Quizzes (20%)**
There will be 4 in-class quizzes throughout the semester. Prior to each I will post a review sheet describing the material you will be expected to know.

**Grade Breakdown**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Paper</td>
<td>30%</td>
</tr>
<tr>
<td>Led discussion</td>
<td>20%</td>
</tr>
<tr>
<td>4 Quizzes</td>
<td>20% (5% each)</td>
</tr>
<tr>
<td>Participation</td>
<td>30% (15% from “in class” participation, 15% from online assignments)</td>
</tr>
</tbody>
</table>

**Schedule**

**January**
- 20 **Review of Neuroscience**
  - Pharmacodynamics
  - Synaptic transmission
  - Ion channels
- 27 **Principles of Pharmacology**
  - Pharmacokinetics
  - Tolerance and Withdrawal
  - Placebo

**February**
- 3 **Addiction**
  - Criteria
  - Theories
- 10 **Acetylcholine**
  - Synthesis, release, inactivation
  - Receptor subtypes
  - Cholinergic Pathways: Central and Peripheral
- 17 **Nicotine**
  - Pharmacology
  - Mechanisms of action
  - Use and Dependence
- 24 **Amino Acid Neurotransmitters: Glutamate**
  - Synthesis, release, inactivation
  - Receptor subtypes and pharmacology
  - Glutamate pathways

**March**
- 3 **Amino Acid Neurotransmitters: GABA**
  - Synthesis, release, inactivation

**Quiz, Paper Topic due**
- 10

**Quiz**
- 24

**Quiz**
Receptor subtypes and pharmacology
GABA pathways

10 NO CLASS: Spring Break

17 Alcohol
  Pharmacology
  Mechanisms of action
  Use and Dependence

24 Opiates
  Synthesis, release, inactivation
  Receptor subtypes and pharmacology
  Endogenous opioid systems

Draft of Paper due

31 Dopamine
  Synthesis, release, inactivation
  Receptor subtypes
  Dopamine pathways and disorders of dopamine systems

April

7 Norepinephrine
  Synthesis, release, inactivation
  Receptor subtypes and pharmacology
  Norepinephrine pathways

Quiz

14 Cocaine and Amphetamine
  Pharmacology
  Mechanisms of action
  Use and Dependence

21 Serotonin
  Synthesis, release, inactivation
  Receptor subtypes and pharmacology
  Serotonin pathways

28 Antidepressants
  Pharmacology
  Mechanisms of action
  Depression and Anxiety

Quiz, Final Paper due