

Course syllabus, lectures, and schedule are subject to change at any time  
 Course: BIOL 4220.001/BIOL 5220.001, Neuropsychopharmacology  
 Semester: Fall 2026  
 Lecture: MWF 9:00 am - 9:50 am  
 Location: ENV 130

|            |                                                                  |
|------------|------------------------------------------------------------------|
| Professor: | Dr. Nicoladie Tam                                                |
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| Office hr: | MWF 10 am - 10:50 am or by appointment                           |

**Textbooks:**

*Neuropsychopharmacology* by Tam. TopHat, Toronto, Canada <https://app.tophat.com/e/046236>/ISBN: 978-1773307947 (required)  
*Psychopharmacology: Drugs, the Brain, and Behavior* by Meyer and Quenzer. Sinauer, MA, 2018. 3rd Edition. 840 pages. ISBN: 978-1605355559 List price: \$169.99

*Principles of Neuropsychopharmacology* by Feldman, Meyer, & Quenzer. Sinauer, MA, 1997. 1st Edition. 909 pages. ISBN: 978-0878931750 List price: \$114.83 \$252.54

*A Primer of Drug Action* by Julien. W. H. Freeman & Co, NY, 2023. 15th Edition. 704 pages. ISBN: 978-1319244866  
 List price: Paperback: \$154.99 eBook: 107.99

*The Biochemical Basis of Neuropharmacology* by Cooper, Bloom & Roth. Oxford Univ Press, NY 2002. ISBN: 978-0195140088  
 List price: Paperback: \$45.00

**Course Audience:**

This self-contained course is designed for students with diverse backgrounds in neurobiology and related disciplines, including psychology, biochemistry, and biophysics. Attendance is required.

**Course Objectives:**

Students are expected to demonstrate competency by thinking critically and demonstrating in-depth knowledge of the following:

- scientific methods in neuroscience, neuropharmacology, and neuropsychology, and biochemical mechanisms in the CNS
- neurobiological basis of functions, disorders, and treatments
- effects of psychotropic drugs on physiology and behavior

By semester's end, students should grasp how medicine, the brain, and behavior interact; understand the neurobiological basis of mental disorders (affecting mood, motor function, thought, and developmental defects); and know how to target drug treatment based on receptor-binding and neurobiological circuits.

**Attendance Policy:**

UNT Policy 6.039: [https://policy.unt.edu/sites/default/files/06.039\\_StudentAttendanceAbsence.Pub2\\_19.pdf](https://policy.unt.edu/sites/default/files/06.039_StudentAttendanceAbsence.Pub2_19.pdf)

According to UNT Policy 6.039, students must attend lectures regularly, participate, and be punctual. Absences can lower participation grades. Excused absences must be in writing. Watching recordings isn't attendance.

**Class Participation:**

Students are expected to participate in lectures, including in-class exercises and Q&A activities, which may be graded as part of the homework.

**Grading Policy:**

Exams (each of the 4 exams counts as 20% of the final grade):

- 3 in-class exams (multiple-choice questions; incremental, covering materials from the previous to the current exam).
- Final Exam (essay questions; comprehensive, covering materials for the entire semester).
- Graduate students enrolled in BIOL 5220 must write a term paper (16.7%), while each exam and HW count 16.7%

Homework (total HW counts 20% of final grade):

- Canvas HW + TopHat HW + in-class exercises = total HW grades

Extra credit (optional):

- Optional assignments are extra credit. They will help your grades, but won't penalize you if you don't do them.

**Note:**

- **Final grade = 4xExam (4x20%) + HW (20%) + ExtraCredits**
- Any work that plagiarizes without citing sources is considered cheating.
- Posted Canvas grades are for verification of accuracy.
  - Canvas calculations may be inaccurate because the system struggles with weighted averages and optional assignments.
  - It may also experience syncing issues with TopHat.
- Use the formula above to calculate the final manual grade.

**Exam Policy:**

Students may not leave the classroom until 20 minutes after the exam begins. Once the first student leaves, no one else may start the exam; late arrivals must take the comprehensive makeup exam. Once a student leaves, they may not return to take the exam.

**Incomplete Grade Policy:**

Only students with documented emergencies will receive an "I" (incomplete) for the final exam.

**Code of Conduct:**

UNT Policy 07.012: [https://policy.unt.edu/sites/default/files/07.012\\_CodeOfStudentConduct.Final8\\_19\\_0.pdf](https://policy.unt.edu/sites/default/files/07.012_CodeOfStudentConduct.Final8_19_0.pdf)

Students must earn grades with integrity and adhere to the UNT Student Code of Conduct.

**Academic Integrity Policy:**

UNT Policy 06.003: [https://policy.unt.edu/sites/default/files/06.003\\_AcadIntegrity.Final\\_19.pdf](https://policy.unt.edu/sites/default/files/06.003_AcadIntegrity.Final_19.pdf)

No electronic devices, including cell phones and Bluetooth, are allowed during the exam. Talking or seeking help from others is prohibited. Scantrons will be photocopied for records. Altering bubbles counts as cheating. Violating the UNT Academic Integrity Policy, including plagiarism or helping others, may lead to disciplinary actions like a zero grade or referral to the Office of Academic Affairs Integrity.

**Disability Accommodation:**

UNT Policy 04.015: [https://policy.unt.edu/sites/default/files/04.015\\_04.014\\_ADAAccommodation.Merger.Final11\\_20.pdf](https://policy.unt.edu/sites/default/files/04.015_04.014_ADAAccommodation.Merger.Final11_20.pdf)

The Department of Biological Sciences follows the Americans with Disabilities Act and offers accommodations for qualified students. If you qualify and need adjustments, submit documentation to the Office of Disability Accommodation (ODA) at the semester's start. <https://studentaffairs.unt.edu/office-disability-access>

**Tentative lecture schedule**

The lecture schedule is approximate and a guideline for the expected order. Content and topics may change as needed. Students must attend lectures.

|                   |                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Exam #1</b>    | Friday, September 25, 2026                                                                                   |
| <b>Exam #2</b>    | Friday, October 23, 2026                                                                                     |
| <b>Exam #3</b>    | Friday, November 20, 2026                                                                                    |
| <b>Final Exam</b> | <b>Monday, December 7, 2026, 8 am to 10 am</b>                                                               |
| Topics            | Lectures                                                                                                     |
| 1                 | Introduction to neuropsychopharmacology, evolution of the nervous system: functions and dysfunctions         |
|                   | <b>Behavioral Neural Circuitries and Survival Functions</b>                                                  |
| 2                 | Behavioral avoidance system in fear and anxiety in mammalian evolution                                       |
| 3                 | Behavioral reinforcement system and associative learning and memory in behavioral drive and addiction        |
|                   | <b>Physiological Neural Circuitries and Functions</b>                                                        |
| 4                 | Emotional circuitries for learning and memory and prediction in relation to affective disorders              |
| 5                 | Sensory circuitries for neural processing from physical sensation to cognition, perception, and localization |
| 6                 | Motor circuitries for actuation, coordination, and motor disorders                                           |
|                   | <b>Neurotransmitter Circuitries and Drug Actions</b>                                                         |
| 7                 | Catecholaminergic systems and dopaminergic system for rewards, decisions, and behavioral motivations         |
| 8                 | Noradrenergic system and serotonergic system for alertness, safety, and security                             |
| 9                 | Cholinergic, glutaminergic, GABAergic, opioid and anandamide systems for cognition, anxiety, pain processing |
|                   | <b>Neural Transmission: Synaptic Mechanisms, Vesicular Release and Transporters</b>                          |
| 10                | Vesicular release and cytoplasmic release process in amphetamine-induced release by drugs                    |
| 11                | Reverse transporter model for amphetamine and MDMA induced release of neurotransmitters                      |
|                   | <b>Behavioral Psychology</b>                                                                                 |
| 12                | Classical and operant conditioning on reinforced behavior with positive and negative reinforcers             |
| 13                | Reinforcement schedule for inducing reinforced behavioral activation and behavioral avoidance                |
| 14                | Stimulus response function, innate reflex, conditioned reflex, learning and memory mechanisms                |
| 15                | Behavioral conditioning, neural mechanism of synaptic plasticity                                             |
|                   | <b>Pharmacology of Drug Actions and Drug Effects</b>                                                         |
| 16                | Drug-receptor and drug-enzyme bindings                                                                       |
| 17                | Dose response curve, population response, dosage and toxicity                                                |
| 18                | Drug half-life and dosage calculation                                                                        |
| 19                | Fate of drug: administration, absorption                                                                     |
| 20                | Fate of drug: distribution, binding, inactivation and excretion                                              |
| 21                | Ionization of drug and its effect on drug absorption                                                         |
| 22                | Drug metabolism and by-products                                                                              |
| 23                | Drug tolerance, cross-tolerance, behavioral tolerance and sensitization                                      |
|                   | <b>Behavioral Psychology and underlying Neural Mechanisms</b>                                                |
| 24                | <b>Cognitive Disorders and Alzheimer's Disorder:</b> symptoms and treatments                                 |
| 25                | <b>Motor Disorders and Parkinson's Disorder:</b> symptoms and treatments                                     |
|                   | <b>Attention Deficit Hyperactivity Disorder (ADHD) and Developmental Disorders.</b>                          |
| 26                | ADHD characteristics, symptoms, etiology, and screening tests                                                |
| 27                | Executive control functions and working memory in the prefrontal cortex (PFC)                                |
| 28                | Genetic traits, candidate genes involved in ADHD and pharmacological treatments of ADHD                      |
|                   | <b>Affective Disorders: Mood Disorders, Depression, Mania and Bipolar Disorder</b>                           |
| 28                | Affective disorders: Depression characteristics and symptoms, mania and bipolar disorder                     |
| 30                | Hypothalamic-pituitary adrenal axis: Model of stress factors in endocrine feedback                           |
| 31                | Suicidal risk factors, animal models of depression, treatment of depression and classes of antidepressants   |
| 32                | MDMA, empathogen and entactogen, therapeutical use, PTSD                                                     |
|                   | <b>Anxiety Disorders</b>                                                                                     |
| 33                | Anxiety disorders, phobia, obsessive compulsive disorder, and subtypes of anxiety disorder and symptoms      |
| 34                | Pharmacotherapy of anxiety disorders, neural mechanisms and classes of anxiolytic drugs                      |
| 35                | Barbiturate, benzodiazepine and dependence                                                                   |
| 36                | Alcohol, alcoholism, treatment and dependence                                                                |
|                   | <b>Schizophrenia and Thought Disorders</b>                                                                   |
| 37                | Psychosis and Schizophrenia and Subtypes of schizophrenia                                                    |
| 38                | Risk factors in schizophrenia, pathology and etiological model of schizophrenia                              |
| 39                | Pharmacological treatments of schizophrenia                                                                  |
| 40                | Psychotherapy and Johari window                                                                              |
| 41                | Nicotine and caffeine                                                                                        |