**Syllabus PSY 493 Section 007: Neuroscience of Psychopathologies**

Spring 2022; Monday 3 – 5.50 pm

Note that lectures are either **in-person** (**Baker Hall 255**), **synchronous** (**TopHat virtual**) or **asynchronous** (**D2L+Tophat**). Check the class schedule below for details.

**Instructor**

Dr. Alexa Veenema; Office: 4018 ISTB; Office Hours: by appointment; aveenema@msu.edu

**Course prerequisites**

PSY 209 Brain & Behavior or NEU 301 Intro to Neuroscience I. Students should have a basic knowledge of the central nervous system.

**Course Description**

The course provides an overview of the neurobiological mechanisms underlying developmental and adult psychopathologies including depression, anxiety disorders, violence, personality disorders, autism, and schizophrenia. We will explore the involvement of neurotransmitters in psychopathology, including serotonin and dopamine, neuropeptides such as vasopressin and oxytocin, stress hormones, neuronal connectivity, and neural circuits. We will discuss how genetic background and early environment can be risk factors for the development of psychopathologies. We will review how neurotransmitters, neuropeptides, stress hormones, and impaired neuronal connectivity may mediate abnormal regulation of emotion, cognition, and social behavior. The course will discuss current findings from human studies and from animal models of psychopathology.

**Course Readings**

The course material consists of scientific journal articles (research reviews and primary research articles). All journal articles will be posted on D2L (https://d2l.msu.edu/). To provide the option to discuss the latest discoveries in the field, primary research articles may be posted only one week before the articles are discussed in class. The journal articles serve as a basis for the class lectures in which we will further elaborate on the specific topics. Please read the journal articles in advance and be prepared to discuss them in class.

**Access to course materials**

The syllabus, the required readings, and information about the writing assignment (see below) are posted on D2L (https://d2l.msu.edu/). The lecture slides will be posted on D2L before the corresponding lecture. The lecture slides are also available on TopHat (see below) after the corresponding lecture.

**Top Hat**

This course requires the use of Top Hat (www.tophat.com), a classroom engagement tool that is designed to assess your understanding of course material in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. *All student responses to Top Hat questions will be graded on participation and correctness* (See **Overall Grade** for further details).

You can visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

In addition to allowing for immediate response to questions in class through your device, this course will be using Top Hat with *Top Hat Test* to allow us to go paperless and *run exams online from any personal or mobile device* (i.e., your phone or laptop) in a secure testing environment. If you leave the browser during a test, you will be automatically locked out of the test. **It is very important that you purchase your Top Hat subscription with Top Hat Test option** at the beginning of this course so that there are no complications when it is time for the first Top Hat exam! See this article for more information on purchasing Top Hat Test: https://success.tophat.com/s/article/Student-Purchasing-Top-Hat-Test.

If you signed up for the course, an email invitation from Top Hat will be sent to you by email. If you didn’t receive this email, you can register by visiting the PSY493 course website: https://app.tophat.com/e/577993

Note: The PSY493 Neuroscience of Psychopathologies Course Join Code is 577993

Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing.

Should you require assistance with Top Hat, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

**Access to Lectures**

This course will be given in three different modes:

* **In-person**: In-person lectures will occur in Baker Hall 255, and we will make use of TopHat to present the lecture slides and to have in class Tophat questions to be answered live. All exams will be taken in-person using TopHat Test.
* **Asynchronous**: Recorded lectures are posted on D2L and there will be homework by answering questions of the corresponding lecture material that is posted on TopHat
* **Synchronous**: Live lectures will occur through Tophat virtual classroom. To access the live lectures, simply log into TopHat and as soon as the professor launches the Virtual Classroom for this course, you will receive a prompt to join the Virtual Classroom.
* **Check the class schedule below which mode is used for each of the lectures**

**Exams**

There will be **three exams** (consisting of multiple choice-, true/false, and short essay-type questions) during class time using **TopHat Test**. Exams are not cumulative. There is no final exam. You will be tested on class lecture material and your readings.

**Make up exam**

No make-up exams will be scheduled during the semester. If you missed an exam, you will need to discuss your options with the instructor. *Please be aware that it is against MSU policy for a professor to give any individual student a special opportunity that is not provided to all students. We will not be allowed to provide individuals special chances for extra credit or extra opportunities to make up exams, etc.*

**Writing assignment**

There will be one writing assignment. For this assignment, you will select a peer-reviewed primary research article related to this course. *Your peer-reviewed article of choice must be emailed to Prof. Veenema by* ***January 31st*** *for approval*. You will then critically review and analyze the peer-reviewed article: (1) Write a summary of the article, including why the research is important, what their hypotheses were, what methods were used, and what the results/conclusions were. (2) Include a critical analysis of the paper, including aspects of the article that could be improved, and your own ideas/interpretation of the results. (3) Come up with a brief explanation (about ½ page) of an experiment that would be a good follow-up experiment to the paper (i.e., what questions are still left unanswered? What should the experimenters do next?). The written assignment should be 2-3 pages (not longer!). Text should be double-spaced. Font size should be 12. *The writing assignment is due* ***April 4th***.

**Overall grade**

The three exams and the writing assignment together will count for 100% (with each component worth 25%). Each exam consists of multiple choice-, true/false, and short essay-type questions with a total worth of 100 points per exam. *You can earn bonus points for each of the three exams with your responses to in-lecture Top Hat questions*: If you answered 40-50% of the in-class TopHat questions correct, you will earn 2 bonus points; If you answered 51-60% of the in-class TopHat questions correct, you will earn 3 bonus points; If you answered > 60% of the in-class TopHat questions correct, you will earn 4 bonus points.

**No other extra credit points will be given to any student in this course and emails from students asking for extra credit will not be answered.**

**Grades**

Grades will be assigned according the following scale: 90-100% = 4.0; 85-89% = 3.5; 80-84% = 3.0; 75-79% = 2.5; 70-74% = 2.0; 65-69% = 1.5; 60-64% = 1.0; < 60% = 0.

**Organization of the course**

***Topic 1: Psychopathologies: an overview***

1. A decade for psychiatric disorders. Nature 2010, 463:9.

2. Insel TR. Faulty circuits. Scientific American 2010, 302:44-51.

3. Nestler EJ, Hyman SE. Animal models of neuropsychiatric disorders. Nature Neuroscience 2010, 13:1161-1169.

***Topic 2: Novel insights in the neurobiology of depression and anxiety disorders***

1. Castren E. Is mood chemistry? Nature Reviews Neuroscience 2005, 6:241-246.

2. Berton O, Nestler EJ. New approaches to antidepressant discovery: beyond monoamines. Nature Reviews Neuroscience 2006, 7:137-151.

3. Schläpfer TE, Bewernick BH. Deep brain stimulation for psychiatric disorders--state of the art. Adv Tech Stand Neurosurg. 2009, 34:37-57.

***Topic 3: Emotion dysregulation in psychopathology***

1. Dalgleish T. The emotional brain. Nature Reviews Neuroscience 2004, 5:582-589.

2. Quirk GJ, Milad MR. Neuroscience: Editing out fear. Nature 2010, 463:36-7.

***Topic 4: Neural circuits of aggression: relevance for personality disorders and violence***

1. Nelson RJ, Trainor BC. Neural mechanisms of aggression. Nature Reviews Neuroscience 2007, 8:536-546.

2. Davidson RJ, Putnam KM, Larson CL. Dysfunction in the neural circuitry of emotion regulation – a possible prelude to violence. Science 2000, 289:591-594.

***Topic 5: Vasopressin and oxytocin as potent regulators of social behavior: clinical implications for autism & schizophrenia***

1. Modi ME, Young LJ. The oxytocin system in drug discovery for autism: Animal models and novel therapeutic strategies. Hormones and Behavior 2012, 61:340-50.

2. Meyer-Lindenberg A, Domes G, Kirsch P, Heinrichs M. Oxytocin and vasopressin in the human brain: social neuropeptides for translational medicine. Nature Reviews Neuroscience 2011, 12:524-538.

**Class Schedule (in person = P; synchronous = S; Asynchronous = A)**

|  |  |  |
| --- | --- | --- |
| 1/10 | Topic 1 **(A)** | A decade for psychiatric disorders (2010); Insel (2010) Faulty circuits |
| *1/17* | *No class* |  |
| 1/24 | Topic 1 **(A)** | Nestler & Hyman (2010) Animal models of neuropsychiatric disorders Castren (2005) Is mood chemistry? |
| 1/31 | Topic 2 **(P)** | Berton & Nestler (2006) New approaches to antidepressant discovery |
| 1/31 | Writ. Assign. | Deadline to email your article of choice to Prof. Veenema for approval |
| 2/7 | Topic 2 **(P)** | Schlapfer & Bewernick (2009) Deep brain stimulation for psychiatric disorders |
| **2/14** | **Exam 1 (P)** | **Topic 1 & 2** |
| 2/21 | Topic 3 **(P)** | Dalgleish (2004) The emotional brain  |
| 2/28 | Topic 3 **(P)** | Quirk & Milad (2010) Editing out fear |
| *3/7* | *Spring Break* |  |
| 3/14 | Topic 4 **(S)** | Nelson & Trainor (2007) Neural mechanisms of aggression |
| 3/21 | Topic 4 **(S)** | Davidson et al (2000) Dysfunction in the neural circuitry of emotion regulation |
| **3/28** | **Exam 2 (P)** | **Topic 3 & 4** |
| 4/4 | Topic 5 **(P)** | Modi & Young (2012) The oxytocin system in drug discovery for autism |
| 4/4 | Writ. Assign. | Writing assignment due! Submit on D2L. |
| 4/11 | Topic 5 **(P)** | Modi & Young (2012) The oxytocin system in drug discovery for autism |
| 4/18 | Topic 5 **(P)** | Meyer-Lindenberg et al (2011) Oxytocin and vasopressin in the human brain |
| **4/25** | **Exam 3 (P)** | **Topic 5** |

# Other issues

## The professor is here to help you learn. We are happy to discuss with you any questions related to the course material as well as questions you might have that go beyond what we are able to cover in class. We also would like to help students that are having difficulties with the class and might like general advice about how to study more effectively.

Please email the professor if you have any concerns about your ability to succeed in this course due to challenges of online learning, technology, and the Tophat platform with differing availability by country. We will try to work with you so that you have full access to all course materials.

Please email the professor if you must miss class due to illness or self-isolation. We will try to work with you so that missed classes will not harm your performance or put you at a disadvantage in the class.

If you stay on MSU campus, please obey all MSU policies including those policies to slow the spread of COVID-19 (<https://msu.edu/together-we-will/keeping-spartans-safe/>).

## Academic honesty: Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." The Department of Psychology adheres to the policies on academic honesty as specified in General Student Regulations 1.0, *Protection of Scholarship and Grades*; see [https://ombud.msu.edu/resources-self-help](https://www.msu.edu/~ombud/academic-integrity/index.html)). Cheating will be taken very seriously and any student that violates MSU rules (i.e., is caught cheating on any assignment) will be given a failing grade for the class, the incident will appear permanently on the students’ record and the case will be brought to the attention of the Psychology Department advisors who may take further action.

## Accommodations for students with disabilities: MSU is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at [rcpd.msu.edu](http://rcpd.msu.edu/). Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to Dr. Veenema at the start of the term and/or ***two weeks before the exam date***. Requests received after this date may not be honored.

Limits to Confidentiality: Please be aware that class materials are generally considered confidential pursuant to the University’s student record policies. However, all University employees, including instructors, cannot maintain confidentiality when it conflicts with their responsibility to report certain issues based on external legal obligations or health and safety considerations of MSU community members and others. As the instructor, Professor Veenema must report the following information to other University offices if you share it with her:  Suspected child abuse/neglect, even if this maltreatment happened when you were a child; Allegations of sexual assault or sexual harassment when they involve MSU students, faculty, or staff; Credible threats of harm to oneself or to others. These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared.  In almost all cases, it will be your decision whether you wish to speak with that individual or not. If you would like to talk about these events in a more confidential setting, you are encouraged to make an appointment with the MSU Counseling Center (http://www.counseling.msu.edu/students).

Additional resources for students:

[Spartan Code of Honor](http://splife.studentlife.msu.edu/spartan-code-of-honor-academic-pledge)

[Mental Health](https://caps.msu.edu/faculty-staff/Syllabus-Language.html)

[Tolerance and civility](https://hr.msu.edu/policies-procedures/university-wide/tolerance_civility.html)

[Religious Observance Policy](https://reg.msu.edu/ROInfo/Notices/ReligiousPolicy.aspx)

[Student Athletes](https://hr.msu.edu/policies-procedures/faculty-academic-staff/faculty-handbook/student_athlete_relationships.html)

[Pronouns](https://lbgtrc.msu.edu/home/resources-for-staff-and-faculty/)