PSY 215: Biology of Behavior
Mon/Wed 11:30am-12:50pm, Central King Building 212

SYLLABUS DRAFT 1/21/25 – SUBJECT TO REVISION

Instructor: Dr. Julia Hyland Bruno
Contact: julia.hylandbruno@njit.edu
Office hour: Wed 1:30-2:30pm (on ZOOM), or by appointment

PREREQUISITES

PSY 210 (Introduction to Psychology) must be taken as a pre- or co-requisite.

COURSE DESCRIPTION

This course provides a general introduction to the underlying biological principles and mechanisms that give rise to complex human behaviors. Topics include neurons, neural communication, brain structure and function, processing in sensory systems, cognitive neuroscience, and neural and hormonal influences on health and emotion. This course focuses on emerging methods and approaches to an integrated understanding of complex behavior, with an emphasis on applications for STEM professional practice.

LEARNING OUTCOMES

This course provides the opportunity for students to:

- understand the multiple levels of causation involved in biological explanations of behavior (i.e., mechanistic, developmental, functional, and evolutionary);
- appreciate phenomena related to brain and behavior through an integrative lens;
- demonstrate familiarity with the major theoretical perspectives and core empirical findings in the history of biopsychology;
- apply biopsychology concepts and knowledge to clinical case studies;
- sharpen critical thinking skills;
- take an active role in their own learning.

COURSE MATERIALS

Readings: The textbook for this course is accessible online for free:

- **Kirby, E. D., Glenn, M. J., Sandstrom, N. J., & Williams, C. L (Eds.). (2024). *Introduction to behavioral neuroscience.* OpenStax. https://openstax.org/details/books/introduction-behavioral-neuroscience**

Supplemental readings will be drawn from the following texts, with electronic copies made available on Canvas:

- **Sacks, O. (1987). *The man who mistook his wife for a hat.* Harper Perennial.**
- **Sapolsky, R. M. (2017). *Behave: The biology of humans at our best and worst.* Penguin Press.**
- **Swanson, L. W. (2003). *Brain architecture: Understanding the basic plan.* Oxford University Press.**
- **von Uexküll, J. (1992). *A stroll through the worlds of animals and men: A picture book of invisible worlds* (C. H. Schiller, Trans.). In *Semiotica, 89* (4), 319-391. (Reprinted from *Instinctive behavior*, pp. 5-80, by C. H. Schiller, Ed., 1934/1957. International Universities Press)**

Course website: You will need internet access to view course content via the web-based course software Canvas. Please make sure that you can log in and access the site (https://njit.instructure.com/).

Course notebook: Please obtain a notebook and bring it with you to every class meeting. You will use this notebook for all course reading and class notes. Please speak with me individually if writing by hand is an issue for you.

Communication: Email is the primary mode of communication in this course. Please check your email regularly and make sure your Canvas notifications are set to receive broadcast announcements via email. If I do not respond to your email within 24 hours, please follow up with me. We will be using Google Drive (Docs/Sheets/Slides/Forms) throughout the semester. Please use the account associated with your NJIT email.

COURSE STRUCTURE AND REQUIREMENTS

Unit structure: This course is organized into four units. Unit 1 covers foundations of biopsychology, including basic neuroscience, evolutionary principles, and the circuitry of simple behaviors. Unit 2 focuses on sensation and perception, encompassing organism-environment interactions and species-typical behaviors. Unit 3 examines internal processes and regulators of behavior such as motivation, homeostasis, hormones and emotions. Finally, in unit 4 we will consider more complex behaviors, behavioral development, and experience-dependent plasticity (learning).

Format: This course consists of lectures, discussions, individual and small-group in-class assignments, four unit exams, and a final oral exam requiring students to delve deeper into a topic of interest. Lectures will integrate assigned textbook chapters with other relevant content. *Preparation, attendance and participation are required*.

Grading currency: All points earned in this course are percentage points of the final grade.

Preparation: It is important to complete the assigned readings before each class. You are strongly encouraged to take systematic notes in your course notebook and test your knowledge of the textbook readings using the Multiple Choice and Fill in the Blank questions included at the end of each chapter. Write down any questions you have about the reading, and be prepared to ask your questions during the lecture. You should **always** have questions!

Quizzes/in-class assignments: Throughout the course there will be regular reading quizzes and other graded in-class assignments, counting toward 15% of your course grade. A maximum of 1 point can be earned per class for these assessments. Quizzes and in-class assignments may not be made up, but there will be more than 15 opportunities to earn credit for in-class work.

Ungraded classwork: Most classes will also involve ungraded (but required; see Participation, below) written work, for the dual purpose of helping students reflect on their learning of the material and giving me regular feedback about how the course is going.

Participation: Participation will be graded per unit, and grades will be based on submitting complete responses to feedback/reflection prompts as well as participating verbally in class.

Office hours: I will provide a weekly sign-up sheet for my office hours. Please plan to schedule one-on-one meetings with me at least once in the first half of the course and once after spring break.

Exams: There will be an integrative in-class exam at the end of each the four course units. Each unit exam is worth 15 percentage points of your course grade. Exams will cover the assigned

readings and content focused on in class. Details about the final oral exam will be distributed in the first quarter of the course.

Extra credit: With the exception of the final oral exam, all assignments will include the opportunity to earn some extra credit points. No additional extra credit will be offered.

Course activities are worth the following percentages of your final grade:

- **Participation: 10%**
  - Unit 1: 2.5%
  - Unit 2: 2.5%
  - Unit 3: 2.5%
  - Unit 4: 2.5%
- **Quizzes/in-class assignments: 15%**
- **Unit exams: 60%**
  - Exam #1: 15%
  - Exam #2: 15%
  - Exam #3: 15%
  - Exam #4: 15%
- **Final exam (oral): 15%**

Letter grades will be determined using the following scale:

Percentage	**Grade (description)**
≥ 90	A (superior)
≥ 85, < 90	B+ (excellent)
≥ 80, < 85	B (very good)
≥ 75, < 80	C+ (good)
≥ 70, < 75	C (acceptable)
≥ 60, < 69	D (minimum)
< 60	F (inadequate)

ACADEMIC INTEGRITY AND COURSE POLICIES

Plagiarism and cheating: NJIT requires me to include this language:

> ***Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your***

responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. ***Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.*** *If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.*

Generative AI: Except where explicitly instructed otherwise, this course expects students to work without artificial intelligence assistance in order to better develop their critical thinking skills.

Class recording: **This course may not be recorded without permission of the instructor.**

Student absences for religious observance: NJIT is committed to supporting students observing religious holidays. Please notify me in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

Extenuating circumstances: Any extenuating circumstances that could interfere with your ability to complete the requirements for this course must be taken to the Office of the Dean of Students. The Office of the Dean of Students will discuss your situation with you, assess any relevant documentation, and make the determination of whether extenuating circumstances exist. Special accommodations (e.g., late withdrawal from the course, request for a make-up exam, request for an Incomplete, etc.) will be granted at the discretion of the instructor.

ACCESSIBILITY AND COUNSELING SERVICES

If you anticipate any issues related to the format or materials of this course, or if you would like to discuss any accommodations that might be helpful, please contact me at the start of the semester. If you have a documented disability, or if you think you might have a disability, you should also be in touch with the Office of Accessibility Resources and Services (OARS), either to request an official accommodation or to discuss requesting one. More information about OARS is available here: https://www.njit.edu/accessibility/.

The Center for Counseling and Psychological Services (C-CAPS) provides a number of confidential resources for any student interested in seeking help with personal issues, emotional concerns, or stress. Visit https://www.njit.edu/counseling/ to learn more.

SCHEDULE

#	Date	Topic	Readings
1	1/22	Introduction	
Unit 1: Foundations of biopsychology			
2	1/27	Nervous system structure and function • *Sign up for one-on-one mtg*	• Kirby et al., Ch. 1
3	1/29	Neurophysiology	• Kirby et al., Ch. 2
4	2/3	Neurophysiology	• Swanson, "Preface" • Swanson, "How the brain works" • Swanson, "The simplest nervous systems" • Swanson, "Brain and behavior"
5	2/5	Neurochemistry	• Kirby et al., Ch. 3
6	2/10	Comparative neuroscience	• Kirby et al., Ch. 4
7	2/12	Review	• Sapolsky, "Appendix 1: Neuroscience 101"
8	2/17	Exam #1	
Unit 2: Environmental influences on behavior			
9	2/19	Vision	• Kirby et al., Ch. 6
10	2/24	Hearing and balance	• Kirby et al., Ch. 7
11	2/26	The chemical senses	• Kirby et al., Ch. 8
12	3/3	Sensory ethology	• Von Uexküll, "A stroll through the worlds of animals and men"
13	3/5	Touch and pain	• Kirby et al., Ch. 9
14	3/10	Review	• Sacks, "The disembodied lady" • Sacks, "Phantoms" • Sacks, "On the level" • Sacks, "The dog beneath the skin"
15	3/12	Exam #2	
	3/17	NO CLASS – SPRING BREAK	
	3/19	NO CLASS – SPRING BREAK	
Unit 3: Emotion, motivation and behavioral state			
16	3/24	Emotion and mood	• Kirby et al., Ch. 13

		• *Sign up for one-on-one mtg*	
17	3/26	Stress	• Kirby et al., Ch. 12
18	3/31	Biological rhythms and sleep	• Kirby et al., Ch. 15
19	4/2	Homeostasis	• Kirby et al., Ch. 16
20	4/7	Review	• Sacks, "Witty ticcy Ray" • Sacks, "Cupid's Disease"
21	4/9	Exam #3	
Unit 4: Behavioral complexity and plasticity			
22	4/14	Motor control	• Kirby et al., Ch. 10
23	4/16	Learning and memory	• Kirby et al., Ch. 18
24	4/21	Neurodevelopment	• Kirby et al., Ch. 5
25	4/23	Sexual behavior and development	• Kirby et al., Ch. 11
26	4/28	Review	• Sacks, "The man who mistook his wife for a hat" • Sacks, "The lost mariner" • Sacks, "The president's speech" • Sacks, "Hands"
27	4/30	Exam #4	
28	5/5	Integration	
	TBD	Final exam (oral)	