
NEUROENDOCRINOLOGY

Tuesday & Thursday | 0930 – 1045 ET

Prerequisite: NEUR 2001, Principles of Neuroscience

Recommended Preparation: Previous experience reading scientific journal articles (any field)

INSTRUCTOR INFO

Professor: Mary Holder, PhD

Please call me: Dr./Prof Holder or Dr./Prof H.

Ask me about: Anything related to the class, real-world applications of behavioral neuroscience, becoming a neuroscience major, getting involved in research, graduate school and other neuroscience-based careers, places to hike and camp near Tech, culturing wild yeast (sourdough), and sci-fi/fantasy novels

How to contact me:

Email: mary.holder@psych.gatech.edu (expect a response within 24 – 48 business hrs; please use NEUR 4803 in the subject line)

Bluejeans: <https://bluejeans.com/3802089943>

By phone: 404-385-6941

In-person: CULC 333

Office hours: My office hours are Tuesdays 1 pm – 3pm

These are the times that I have dedicated to be available for students for this course. I believe that every student can improve their skills, learn from their mistakes, and be successful in this course. Attending office hours is the best way to deepen your understanding of the material and is a great opportunity to improve your skills. I recommend that all student attend office hours, regardless of performance. If you cannot attend my office hours, but would still like to meet with me, please email me to set up a time that works for both of us.

COURSE DESCRIPTION

How do hormones influence physiology & behavior?

How do sex differences arise? What do these mean?

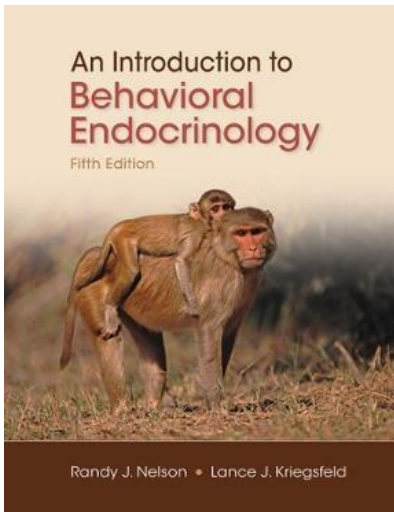
How do hormones mediate sexual & reproductive behaviors?

How do hormones contribute to metabolism and energy balance?

This course is an introduction to the study of the principles of neuroendocrinology. We will examine basic principles of hormone actions and use these principles to explain how and why hormones act as they do to influence physiology and behaviors. In this course, we will learn how hormone actions are studied and how hypothesis testing is applied to key topics in neuroendocrinology. We will focus on many important hormonally-influenced behaviors, such as sexual differentiation, mating, and reproduction, and homeostatic processes, such as energy balance. The general goal of this course is to develop the ability to think like a neuroendocrinologist. By the end of this course, you should be able to identify an interesting scientific question, determine how it could be studied, and critically evaluate the existing evidence to answer it.

Updated 8/17/20

COURSE MATERIALS AND RESOURCES



An Introduction to Behavioral Endocrinology, 5th Edition

Randy Nelson & Lance Kriegsfeld

ISBN-13: 978-1605353203

This book is also available as an e-text through Perusall on Canvas

CmapTools: Concept Mapping tool from Florida Institute for Human and Machine Cognition

All other materials (e.g., pre-class quizzes, case studies, additional readings, and all assignments) will be made available on Canvas. We will also be using TurningPoint, Perusall, VoiceThread, BlueJeans and/or Webex (depending on the day), and Canvas Discussions.

As this course is fully remote, you will need an internet-ready smartphone, tablet, or laptop. It is recommended that you have a web camera (the one on your device should be fine) and a microphone (again, the one build into your device should be fine).

LEARNING OBJECTIVES

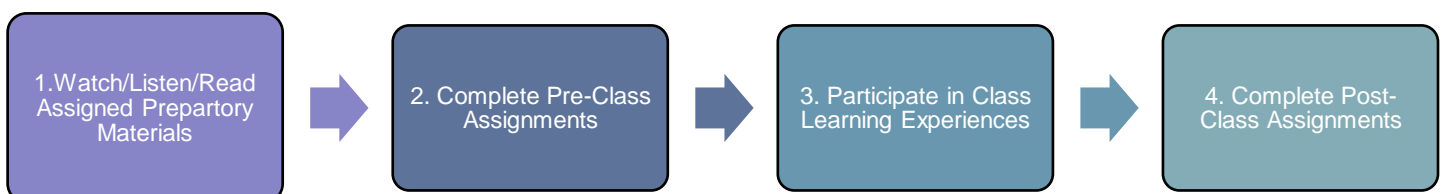
After successfully completing this course, students should be able to:

1. Describe the mechanisms of hormone actions
2. Explain how hormone-brain interactions affect physiology and behavior
3. Demonstrate how hormones regulate homeostatic processes and sociosexual behaviors
4. Illustrate and diagram hormone actions, hormone-brain interactions, homeostatic processes and sociosexual behaviors
5. Interpret graphical representation of neuroendocrine data
6. Design experiments to test neuroendocrine hypotheses
7. Conduct an independent search of current scientific literature on neuroendocrinology
8. Read, interpret, explain, and evaluate primary literature that concerns neuroendocrinology
9. Effectively communicate scientific knowledge in both a written and oral format

COURSE FORMAT

This course will be delivered in a synchronous, remote manner. Our class meetings will revolve around learning activities such as case studies, figure interpretation, discussions, and small-group work. Your out of class work will be doing the required reading prior to class session, post-class reflections, and working on a couple of semester-long projects. This class-set up is because studies have shown that student do not learn much in classes in which the instructor gives a series of lectures and students sit quietly, taking notes (Hake (1998) American Journal of Physics, Klymkowsky et al. (2003) Cell Biology Education.

What is your role as a student?



The flow chart summarizes your tasks and the order in which you should complete them for each topic area. Most importantly, you'll need to watch the lecture videos, read assigned book chapters or articles, and complete any pre-class assignments before each class. You should take notes while engaging with these pre-class materials. During class, you can expect to build your understanding through activities and class discussion.

This course format will ask you to develop skills in identifying what information you need, and learning how to break down a problem into achievable parts. Key attributes of A-level class participation include (based on rubric by Filipe and Pritchett 2013):

- Actively looking for and recognizing inadequacies of existing knowledge,
- Consistently seeking and asking probing questions,
- Using advanced and persistent search strategies,
- Evaluating solutions by assessing reliability and appropriateness of sources.

ASSESSMENT OF YOUR LEARNING

You will be assessed by your performance on various in-class assignments (Participation); pre- and post- class assessments; a communication project; and on three (3) exams.

Assessment Type	Number of Assessments	Percent of your final grade
In-Class Participation	Minimum of 25 full classes during the semester*	10%
Pre-class Prep Papers	25	5%
Weekly Reflections	10*	10%
Review Paper	1 major	20%
Oral Presentation	1	10%
Take-Home Exam 1	1	15%
Take-Home Exam 2	1	15%
Take-Home Exam 3	1	15%

Grades:

This course is graded on a straight scale – you are not competing against anyone else for your grade. The most stringent scale used will be: 90-100% an A, 80-89% a B, 70-79% a C, 60-69% a D, and 59% F.

Grade Repair:

These grade repair options provide opportunities to add an extra 2% to the overall final semester grade. Each of the options are worth 1% point each

Course Surveys: If $\geq 80\%$ of students do the beginning of term survey, mid-term survey, and the final CLOS

Pre-and Post-Tests: Completing both the pre- and post-term quizzes

Grade Changes:

Grades are not negotiable commodities. However, mistakes can and do occur. If you feel a writing assignment or exam has been incorrectly scored, notify your instructors as soon as possible. Any requests for adjustment of grades must be submitted in writing no less than one week after the work has been returned. In all cases, the entire assignment will be re-evaluated and a final, revised grade (higher or lower) will be assigned, if warranted.

Participation: In-class assignments administered through Canvas, as well as active discussion during class, will determine your participation credit for the day. You will receive a score of 4, 2 or a 0 based on your successful completion of assignments and active discussion in class. Although there are more than 25 sessions in the semester, your participation is graded out of 100 possible points, allowing you to earn extra credit by attending every class, and/or potentially miss a class without damaging your grade.

Note that attendance does not directly equal participation; if you are unprepared or off-task, merely being present in the web conference will not earn you points.

Prep Paper: Before each class, you'll complete a pre-class assignment, which will consist of either assigned reading or watching lecture videos/animations. Once you've reviewed the material, write a 1-page long prep paper in which you write one (1) to two (2) paragraphs summarizing the assigned reading or the assigned video lecture for the day. Then pose three (3) questions that you still have. I'll use your prep paper responses to guide what we do in class. These assignments ensure that you come to class with effective baseline knowledge to engage with the day's material. These are graded for completion.

Weekly Reflections: Reflection on our learning is a significant part of making learning durable. There are multiple cognitive benefits for reflection including retrieval of recently learned information, connecting new knowledge to what you already know, and rephrasing key ideas in your own words. In addition, reflection can help regulate our own learning. Therefore, each week without a take-home exam there will be 1 – 3 writing prompts to choose from on Canvas. Your response should be your original works and thoughts, in your own words. These reflections will be assessed according to the clarity of thought and language, the relevance to the student and the course learning goals, the analysis of how the student has gained some insight, and how this material may relate to other courses or past experience.

Communications Project: During the course of the semester, we will not only be learning about all the fascinating ways hormones act to change our physiology and behavior, but we will also be working on our ability to communicate what you've learned to a larger audience. You will be expected to communicate about a topic of interest in neuroendocrinology that is not currently covered in this course. Due dates for communications project assignments are noted in the weekly breakdown section of the syllabus.

Term Paper: Your term paper should be written as a review article, using primary literature sources and be based in CURRENT (2010 or more-recent references) within the field of neuroendocrinology. This paper should be typed using either Arial (font size 11) or Times New Roman (font size 12). This paper should be double-spaced, with 1-inch margins, and be approximately 3 – 5000 words in length. Prior to turning in the final paper, you will upload to complete draft for peer-feedback. You will receive a more detailed assignment instruction and rubric for the term paper.

1. Research Question
2. Annotated Bibliography
3. Complete First Draft
4. Peer Review
5. Complete Final Proposal

Oral Presentation: Your oral presentation should be a didactic lecture for 10mins on your topic. The presentation should cover the major research findings and end with some unanswered research questions. Prior to the presentation, you will submit three slides from your lecture for peer-feedback. You will receive a more detailed assignment instruction and rubric for the presentation on Canvas.

1. Three Slides
2. Peer Feedback
3. Presentation uploaded

Exams: Exams will be mainly short essay with some fill-in-the-blank and multiple-choice questions. The exams will require you to use critical thought to analyze data. That is, exams assess your understanding of concepts and ability to explain and apply those concepts, rather than your ability to memorize facts.

Note that Take-Home exams will be available online and only available *once*. That means that once you open your exam, you will not be able to close your exam and open it again. *I repeat, once you start your exam you MUST finish it in that sitting.* Exams should take about an hour and a half to two hours. So, plan on taking your exam when you have that much time to sit and spend writing your exam. Please note that take-home exams are considered open book and open note BUT NOT open friend or open internet. Cheating includes, but is not limited to, opening the exam and not finishing it in one sitting, discussing the exam with other students, as well as plagiarizing or copying and pasting. Should there be some catastrophic event (e.g., power outage, internet failure), you need to notify me as soon as possible.

Late Assignment and Missed Exam Policy:

No make-up exams will be administered unless you have a college approved absence, but I hope that since you have a weekend to take the exam, you should be able to arrange a time to take it. If you do need a make-up, you will need to make prior arrangements to take the exam earlier. All in-class assignments will be open for 24 hours. If you submit it afterwards, there will be a 10% per day late penalty.

TOLERANCE, COMPASSION AND ASSUMING THE BEST

I think that we can all agree that 2020 has been interesting at best, so I think it important to emphasize the importance of virtues like tolerance, compassion, and assuming the best. Living through a global pandemic is a traumatic experience, which can lead to all of us having increased anxiety, more irritability, and a decreased cognitive capacity and endurance.

This is the first term that I have taught courses fully online. While I have worked hard over the summer to try to make it a good course, with some flexibility built in for the assignments, and being as transparent as possible with which assessments are due, I'm sure I'll make some mistake along the way. I'm also sure that we will have issues with Canvas thorough out the course, such as when it doesn't factor any manually scored items into the grades. I'm also sure we will be a community of learners, growing along the way. When there are bumps in the road, our tolerance, compassion, and assuming the best of each other will help us handle this with grace and humor.

ON ACADEMIC SUPPORT

- There are many options for extra help
 - Office hours for your course instructors and TAs
 - [Peer Led Undergraduate Study \(PLUS\)](#)

- [Help-Desks](#) for 3C's (Calculus, CS, & Chem) and Physics
 - [Office of Minority Educational Development](#)
 - [Learning Assistance Program](#) in First Year Learning Centers located in the residence halls
 - [1-to-1 tutoring](#) through the Center for Academic Success supports more upper division courses
- The [CommLab](#) can help with writing lab reports or presentations
 - The Center for Academic Success offers [on-demand workshops](#) for time management, test prep, etc
 - [Academic Coaching](#) to work with you individually to discuss goals AND formulate strategies to reach them to improve academic skills, motivation, and confidence.

ON PERSONAL SUPPORT

- The [Center for Career Discovery and Development](#) (C2D2) can help you explore potential careers, craft resumes & cover letters and prepare for interviews
- The [pre-graduate and pre-professional](#) advising group in C2D2 that can help you learn about applying for grad or med school
- The [Office of Disability Services](#) can help you arrange accommodations for a learning disability or a service animal
- The [Center for Assessment, Referral, and Education](#) CARE is your primary resource for mental health support, and they can refer you to appropriate resources which can include:
 - [Health Initiatives](#) for issues regarding self-care, stress management, thriving, and resilience
 - The [Counseling Center](#) for a variety of services, including group, couples, and individual counselling, workshops, psychoeducational screens, and crisis intervention
 - [Stamps Psychiatry Clinic](#) for psychiatric evaluations and medication management
- The [Stamps Health Services](#) provides primary care, pharmacy, women's health, immunization, and allergy shots.
- The [Students' Temporary Assistance and Resources \(STAR\)](#) can assist with food, housing, interview clothing needs, and even interest-free emergency loans.
- There are a variety of resource centers for minority students on campus
 - [OMED](#) for underrepresented racial and ethnic groups on campus
 - [Women's Resource Center](#) for women on campus
 - [LGBTQIA Resource Center](#) for LGBTQIA students on campus
 - [Veterans Resource Center](#) for veterans, military, reservist, guard members, and dependents on campus
- The [Dean of Students Office](#) can connect you with specific resources if you are still unsure of where to go for help. The request assistance form is helpful for sharing documentation from Stamps with your professors among other things.

ACADEMIC INTEGRITY POLICIES

Georgia Tech seeks to cultivate a community based on trust, academic integrity, and honor. This Honor Code helps maintain an optimal learning environment that foster academic and scholastic integrity. These include respecting the intellectual property of others, submitting your own individual work unless otherwise allowed by an instructor, and protecting your own academic work from misuse by others. All students are assumed to have read the [GT Academic Honor Code](#) and consented to be bound by it.

This Academic Honor Code prevents any students from gaining an unfair advantage through academic misconduct. For this class, specific examples of academic misconduct and dishonesty include:

- Plagiarism: the unattributed use of words and/or ideas of another person. Examples include, but are not limited to: words written by another person (including yourself for a previous class) or lifted from the internet with and without proper citation; ideas taken from another person without proper citation
- Unauthorized collaboration: working with someone else on graded work (e.g., assignment, exams, or project) without explicit permission from the instructor
- Use of unauthorized aids (including, but not limited to, online 'homework' help sites) during quizzes or exams

In short, produce your own work unless you are told otherwise. You are more than welcome to use your notes and work with others for pretty much every aspect of the course; you just need to make sure that the writing and presentations you submit are ultimately your own.

Learning Accommodations: If needed, we will make classroom accommodations for students with disabilities. These accommodations should be arranged in advance and in accordance with the [Office of Disability Services](#).

COURSE SCHEDULE

The course calendar details what you can expect during each scheduled class session in addition to the due dates for all of your assignments.

Week	Date	Topic	Pre-Class Work	Assignment & Due Dates
1	8/18	Introduction; Behavioral Neuroendocrine Approaches	1 – 6; 9 – 30	
	8/20	Chemical Communication	6 – 9; 36 – 37; Box 1.2; 308 – 311	Reflection 1 Pre-Test due 8/24 by 11:59am
2	8/25	Endocrine Systems	37 - 40	
	8/27	Endocrine Glands	40 – 41; 52 - 64	Reflection 2 Topic Selection Lit Review quiz due 8/31 by 11:59am
3	9/1	Peptide Hormones	41 – 42; 72 – 74; 76 – 82	

	9/3	Steroid Hormones	64 – 72	Reflection 3 Plagiarism & Citation quiz due 9/7 by 11:59am
4	9/8	Pituitary Hormones	42 – 52	
	9/10	Hypothalamic-Pituitary-Organ Axes; Feedback loops	42 – 50	Take Home Exam 1 due 9/14 by 11:59am
5	9/15	Homeostasis & Metabolism	473 – 481	
	9/17	Central Drive of Ingestive Behavior; Ghrelin	487 - 495 Schwarz Nature 2000	Reflection 4 due 9/21 by 11:59am
6	9/22	Within- and Across-Meal satiety signaling	483 – 487; 495 - 500	
	9/24	Leptin & Insulin	484 – 485; 479 – 481	Reflection 5 due 9/28 by 11:59am
7	9/29	Microbiota-Gut-Brain Axis	Video lecture	
	10/1	Energy Expenditure	53 – 54; 477	Take Home Exam 2 Due 10/5 by 11:59am
8	10/6	Sexual Determination	88 – 109	
	10/8	Sexual Differentiation	118 – 138	Reflection 6 Annotated Bibliography due 10/12 by 11:59am
9	10/13	Sex Differences	143 – 159; 186 – 199	
	10/15	Puberty	Video lecture	Reflection 7 due 10/19 by 11:59am
10	10/20	Male Sexual Behavior	206 – 209; 213 – 238	
	10/22	Female Sexual Behavior	275 – 284; 304 – 306; 313 – 316; 318 – 326	Reflection 8 Three Presentation Slides due 10/26 by 11:59am
11	10/27	Pregnancy & Parturition	Video lecture	
	10/29	Parental Behavior	337 – 341; 349 – 370; 376 - 386	Take Home Exam 3 due 11/2 by 11:59am
12	11/3	Presentation Watch Party 1		
	11/5	Effects of Chronic Stress I	582 – 599	Reflection 9 First Draft due 11/9 by 11:59am
13	11/10	Presentation Watch Party 2		
	11/12	Presentations Watch Party 3		Reflection 10 Peer Review due 11/16 by 11:59am

14	11/17	Effects of Chronic Stress II	608 – 613; 622 – 626; 647 - 653	
	11/19	Presentations Watch Party 4		Reflection 11 due 11/23 by 11:59am
15	11/24	Course Wrap-Up		Final Review Paper due 11/24 by 11:59pm

Changes: Course content may vary from this syllabus to meet the needs of this particular class. Students will be notified in class by the instructor when adjustments to this syllabus are required.