UF Department of Applied Physiology and Kinesiology
College of Health and Human Performance
UNIVERSITY of FLORIDA

Movement Neuroscience

APK 4144 | Class #23471 | 3 Credits | Fall 2025

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Course Info

INSTRUCTOR

Joslyn Ahlgren, PhD
*Study tips and a personal note from Doc. A are on the last page
Office: FLG 108
Office Phone: 352-294-1728
Email: jahlgren@ufl.edu
Preferred Method of Contact: **CANVAS email**

OFFICE HOURS

Both ***live*** and ***virtual*** office hours will be offered this semester. A schedule, tips for how to best use office hours, and zoom info for office hours will be posted in CANVAS. Students can expect at least two office hours/week.

MEETING TIME/LOCATION

M,W,F | Period 1 (7:25 - 8:15 AM) FLG 220

COURSE DESCRIPTION

The course provides an in-depth overview and treatment of the sensory and motor systems of the nervous system responsible for regulating movement.

It covers both anatomical and physiological aspects of movement-related components of the nervous system from a functional perspective. Topics include: neuronal signaling; synaptic transmission, somatosensation; proprioception; nociception; vision and eye movements; vestibular; audition; lower vs. upper motor neurons; cortical, basal ganglia and cerebellar regulation of movement; and cognition.

PREREQUISITE KNOWLEDGE AND SKILLS

APK 2100C and APK 2105C (with minimum grades of C) and (sophomore standing or higher) and Applied Physiology and Kinesiology major.

REQUIRED AND RECOMMENDED MATERIALS

Please note that APK4144 will be participating in the UF All Access program. This provides online access to the text as soon as the purchase is made through your school account. Students who do not choose this option can purchase a new or used text through the UF Bookstore or another location of their choice.

This text is REQUIRED: Augustine, G. J., Groh, J. M., Huettel, S. A., LaMantia, A.-S., White, L. E., & Purves, D. (Eds.). (2023). ***Neuroscience*** (7th ed.). Oxford University Press. ISBN: 9780197616246.

Instructional materials for this course consist of only those materials specifically reviewed, selected, and assigned by the instructor(s). The instructor(s) is only responsible for these instructional materials.

COURSE FORMAT

This is a lecture-based course that meets in person for one period, three times per week. All assessments will be closed-notes and given during class time.

COURSE LEARNING OBJECTIVES

By the end of this course, students should be able to:

- Describe electric signaling of nerve cells and synaptic transmission as they pertain to movement.
- Elaborate how sensory systems, including somatosensory (proprioception, touch, pain), visual, auditory, and vestibular systems, relate to movement.
- Discuss each sensory system's peripheral anatomy and physiology, as well as central brain physiology for processing each type of sensory signal.
- Define the function of lower motor neurons, upper motor neurons, cortical physiology of movements, basal ganglia physiology, cerebellar physiology, posture, and eye movements.
- Explain mechanisms of higher-level cognitive function, speech and language motor control as they relate to movement.

A major goal of the course is for students to be able to integrate information across all the above topics to demonstrate a holistic understanding of how the central nervous system controls movement.

Course & University Policies

Details for all UF Course Policies can be found HERE.

ATTENDANCE

Attendance is a required, graded component of this course—see below for details. See UF Academic Regulations and Policies for more information regarding the University Attendance Policies.

PERSONAL CONDUCT & ACADEMIC INTEGRITY

Students are expected to exhibit behaviors that reflect highly upon themselves and our University. University of Florida students are bound by the Honor Pledge. On all work submitted for credit by a student, the following pledge is required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Student Honor Code and Conduct Code (Regulation 4.040) specifies a number of behaviors that are in violation of this code, as well as the process for reported allegations and sanctions that may be implemented. All potential violations of the code, regardless of severity, will be reported to Student Conduct and Conflict Resolution. If a student is found responsible for an Honor Code violation in this course, the instructor will enter a Grade Adjustment sanction which may be up to or including failure of the course. Specifically, any use, access, or handling of technology during an exam will result in a zero on the exam **and** further educational sanctions per the University.

APPROPRIATE USE OF AI TECHNOLOGY

The UF Honor Code strictly prohibits *cheating.* The use of any materials or resources prepared by another person or Entity (inclusive of generative AI tools) without the other person or Entity's express consent or without proper attribution to the other person or Entity is considered *cheating.* Additionally, the use of any materials or resources, through any medium, which the Faculty / Instructor has not given express permission to use and that may confer an academic benefit to a student, constitutes *cheating*.

Best uses of AI technology in THIS course include things like generating practice exam questions or consolidation of information for better understanding of complex concepts. Please note: not all AI resources provide accurate information. Students should use good judgement when consuming or using information from AI sources.

IN-CLASS RECORDING

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. More info on this policy can be found here.

In THIS course, students are permitted to post audio recordings only to the **Sharing is Caring discussion board** in the CANVAS course shell. Recordings (video or audio) may not be shared otherwise.

EXAM MAKE-UP POLICY

Step 1: Get documentation of your illness or emergency. A student experiencing an illness should visit the UF Student Health Care Center or their preferred healthcare provider to seek medical advice and obtain documentation. If you have an emergency/life event you wish to remain more private, you may contact the Dean of Students Office and follow the DSO Care Team procedures for assistance. Your instructor has the final say on whether or not an absence is considered "excused."

Step 2: Fill out the make-up request assignment in canvas – orientation module. Make-ups will not be granted for personal travel/vacations. Additionally, many students will have multiple exams in one day. Only if another exam is scheduled for the same time as an exam in this course will a make-up request be considered.

Requirements for class attendance and make-ups, assignments, and other work are consistent with the university policies found here.

ACCOMMODATING STUDENTS WITH DISABILITIES

Your instructor is committed to creating a course that is inclusive in its design. If you encounter barriers, please let your instructor know immediately so they can determine if there are adjustments that can be made or if accommodation might be needed. You are also welcome to contact the Disability Resource Center's Getting Started page to begin this conversation or to establish accommodations for this or other courses. Your instructor welcomes feedback that will assist in improving the usability and experience for all students. Students who are already registered with UF's DRC should share their accommodation letter with the course instructor and discuss their access needs as early as possible in the semester.

COURSE EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways: (1) The email they receive from GatorEvals, (2) Their Canvas course menu under GatorEvals, or (3) The central portal located here. Guidance on how to provide constructive feedback is available at the gator evals site. Students will be notified when the evaluation period opens. Summaries of course evaluation results are also available at the gator evals site.

Getting Help

HEALTH & WELLNESS

- ***U Matter, We Care:*** If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
- ***Counseling and Wellness Center:*** Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
- ***Student Health Care Center:*** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
- ***University Police Department:*** Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
- ***UF Health Shands Emergency Room / Trauma Center:*** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; or visit the UF Health Emergency Room and Trauma Center website.
- ***GatorWell Health Promotion Services:*** For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

ACADEMIC RESOURCES

- ***E-learning technical support***: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
- ***Career Connections Center***: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- ***Library Support***: Various ways to receive assistance with respect to using the libraries or finding resources.
- ***Teaching Center***: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- ***Writing Studio***: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- ***Student Complaints & Grievances***: Students are encouraged to communicate first with the involved person(s), but here is more information on the appropriate reporting process.

DEPARTMENT ADMINISTRATORS

For suggestions or concerns related to APK courses or programming, please reach out to any of the following:

- Dr. David Vaillancourt (he/him), APK Department Chair, vcourt@ufl.edu
- Dr. Demetra Christou (she/her), APK Department Vice Chair, ddchristou@hhp.ufl.edu
- Dr. Steve Coombes (he/him), APK Graduate Coordinator, scoombes@ufl.edu
- Dr. Anna Gardner (she/her), APK Undergraduate Coordinator, akgardner@ufl.edu

Grading

COURSE COMPONENTS & CALCULATING YOUR GRADE

The following table outlines the point-accruing components of this course. Any changes to this due to mid-semester interruptions will be posted as an announcement in CANVAS. Grades will be determined using the percentages in the table below.

Evaluation Components	Percent of Total Grade
Attendance	20%
Weekly Assessments	60%
Drawings	20%

Attendance – The last 5-7 minutes of every lecture will be used for taking attendance. Students will earn 1 point per class for attendance. ***Chronic tardiness will be addressed directly and may result in partial point penalties.***

> MAKE-UP POLICY FOR ATTENDANCE: **Excused absences can be made up** through (a) submitting documentation of the reason for the absence, and this must align with UF's attendance policy; and (b) completing an oral review of notes that you obtained from a friend. Oral review of notes consists of showing the instructor your notes and then verbally going through a few concepts, answering questions, and/or asking any questions you may have. This can be done during office hours, before or after class, or through a private appointment (live or zoom). Use the make-up request assignment in Canvas to arrange this. **Unexcused absences cannot be made up.**

Weekly Assessments – Once a week, at the beginning of the class period, there will be an assessment on what was covered in lecture that week. These assessments will not take more than half the class period (likely much less) and ample time will be provided to ensure all students have enough time to finish. Answers will be revealed/reviewed in class that same day. Question formats may include multiple choice, multiple answer, true/false, matching, fill in the blank, or free response. Students can expect these to be in the form of canvas quizzes, so laptops or tablets will be necessary on assessment days. Lockdown browser will be required. If Canvas quizzes become problematic, paper assessments will be administered instead.

> MAKE-UP POLICY FOR WEEKLY ASSESSMENTS: **Excused missed assessments can be made up** through (a) submitting documentation of the reason for the absence, and this must align with UF's attendance policy; and (b) setting up a time outside of class to sit for a make-up assessment. Use the make-up request assignment in Canvas to arrange this. **Unexcused missed assessments cannot be made up.**

Drawings – Throughout the semester, you will complete drawings either in class or outside of class. You will submit some of these drawings throughout the semester for credit. These will be graded on completion and accuracy…*not on artistry*. Each drawing will be worth 2 points total. There will be a 1-point deduction for an incomplete drawing…and a 1-point deduction for an inaccurate drawing. Late submissions will not be accepted.

Extra Credit – Students can earn 1 point of extra credit for helping the instructor learn their name. That point will be applied to your lowest weekly assessment score at the end of the semester (*up to a perfect score – you cannot earn more than a perfect grade on any assessment, even with extra credit*). **Extra credit points cannot be applied to an assessment score of zero due to an unexcused absence.**

GRADING SCALE

There is no curve for this course and final grades will not be rounded up. The percentages shown in the table below will be used to calculate grades. Plus and minus grades ARE employed in this course. More detailed information regarding current UF grading policies can be found here. *It is entirely inappropriate to ask your instructor for individualized exceptions to this grading scale. Any such requests will be respectfully ignored.*

Letter Grade	Percent Needed for Each Letter Grade	GPA Impact
A	93.00-100%	4.0
A-	90.00-92.99%	3.67
B+	87.00-89.99%	3.33
B	83.00-86.99%	3.0
B-	80.00-82.99%	2.67
C+	77.00-79.99%	2.33
C	73.00-76.99%	2.0
C-	70.00-72.99%	1.67
D+	67.00-69.99%	1.33
D	63.00-66.99%	1.0
D-	60.00-62.99%	0.67
E	0-59.99%	0

Weekly Course Schedule

CRITICAL DATES & UF OBSERVED HOLIDAYS

- Aug 21: Classes Begin
- Aug 21-22, 25-27: Drop/Add
- Sep 01: Labor Day
- Oct 17-18: Homecoming
- Nov 11: Veterans Day
- Nov 24-29: Thanksgiving Break
- Dec 03: Last day of classes
- Dec 06-12: Finals week

WEEKLY SCHEDULE

The following table represents current plans for the term. Any changes to this plan will be posted in CANVAS.

*There are not pre-set due dates for **drawings**, but students will be given at least 3 business days to complete those impromptu assignments (several of which will be completed during class time).*

Week	Dates	Lecture Topics (*Reading*)	Due Dates
1	Aug 18 – Aug 22	First class is Fri, Aug 22 First day: Syllabus, introductions, something fun!	Pass orientation quiz by Aug 27, 11:59pm

2	Aug 25 – Aug 29	**Unit 1 – Lecture 1 – Studying the Nervous System** *(Ch 1 Pgs 1-20 and 26-32)* **Unit 1 – Lecture 2 – Electrical Signals in Neurons** *(Ch 2 Pgs 37-53; Ch 3 Pgs 64-67; Ch 4 Pgs 74-86)*	Assessment 1 on Friday followed by continued lecture
3	Sep 01 – Sep 05	No class on Monday, Sep 01 – Labor Day Holiday **Unit 1 – Lecture 3 – Voltage and Patch Clamp Methods** *(Ch 3 Pgs 55-58; Ch 4 Pgs 71-75)* **Unit 1 – Lecture 4 – Synaptic Transmission** *(Ch 5 Pgs 93-120; Ch 6 Pgs 122-124; Table 6.1)*	Assessment 2 on Friday followed by continued lecture
4	Sep 08 – Sep 12	**Synaptic Transmission continued**	Assessment 3 on Friday followed by continued lecture
5	Sep 15 – Sep 19	**Unit 2 – Lecture 1 – Vision** *(Ch. 9 pgs posted in canvas)*	Assessment 4 on Friday followed by continued lecture
6	Sep 22 – Sep 26	**Unit 2 – Lecture 2 - Hearing** *(Ch. 10 pgs posted in canvas)*	Assessment 5 on Friday followed by continued lecture
7	Sep 29 – Oct 03	**Unit 2 – Lecture 3 – Vestibular System** *(Ch. 11 pgs posted in canvas)*	Assessment 6 on Friday followed by continued lecture
8	Oct 06 – Oct 10	**Unit 2 – Lecture 4 – Touch and Proprioception** *(Ch. 12 pgs posted in canvas)*	Assessment 7 on Friday followed by continued lecture
9	Oct 13 – Oct 17	**Unit 2 – Lecture 5 – Pain** *(Ch. 13 pgs posted in canvas)* No class on Friday Oct 17 - Homecoming	Assessment 8 on **Wednesday** followed by continued lecture
10	Oct 20 – Oct 24	**Unit 3 – Lecture 1 – Lower Motor Neuron Circuits** *(Ch. 16 pgs posted in canvas)*	Assessment 9 on Friday followed by continued lecture
11	Oct 27 – Oct 31	**Unit 3 – Lecture 2 – Upper Motor Neuron Circuits** *(Ch. 17 pgs posted in canvas)*	Assessment 10 on Friday followed by continued lecture
12	Nov 03 – Nov 07	**Unit 3 – Lecture 3 – Basal Ganglia Modulation** *(Ch. 18 pgs posted in canvas)*	Assessment 11 on Friday followed by continued lecture
13	Nov 10 – Nov 14	**Unit 3 – Lecture 4 – Cerebellar Modulation** *(Ch. 19 pgs posted in canvas)*	Assessment 12 on Friday followed by continued lecture
14	Nov 17 – Nov 21	**Unit 3 – Lecture 5 – Eye Movement and Sensorimotor Integration** *(Ch. 20 pgs posted in canvas)*	Assessment 13 on Friday followed by continued lecture
15	Nov 24 – Nov 28	No class this week - Fall Break Week	No assessment this week
16	Dec 01 – Dec 05	If there is time, we will get into Ch 27 (cognitive functions), Ch 28 (cortical states), and Ch 29 (attention)	Assessment 14 on **Wednesday** followed by continued lecture
Last Exam – Dec 09 – 8-10pm – FLG 220			

SUCCESS AND STUDY TIPS

STUDY TIPS

- **Read from the text BEFORE attending the lectures.** Do not take notes, underline, highlight, or attempt to memorize anything…JUST READ and enjoy! The reading for this class can be a little INTENSE, so if you find it TOO intense prior to lectures, maybe read it AFTER lectures.
- **Read the figure legends.** There are a lot of images from the textbook in the lecture slides. The figure legends in the textbook are pretty darn good…and might be a great tool for understanding major concepts covered on image-heavy slides in lecture (especially if you miss a lecture).
- **Read the Overview and Summary.** Each chapter of the text has an introductory overview and a final summary. These can help you better compartmentalize the chapter info and provide a natural scaffold for your learning. Do not underestimate the value of these sections of the textbook!
- **Study from lectures notes…not the text.** If there is something in the textbook that was NOT covered in lectures, you are not expected to know it. There is a lot in the text that we don't have time to cover.
- **Study from the Learning Objectives for each chapter.** It is highly recommended that as you study (especially with others), you follow along with the learning objectives for each chapter.

SUCCESS TIPS

- **Use the Flip Cards.** For each lecture, flip cards have been created to help you practice important, testable vocabulary terms.
- **Manage your time.** Attendance is mandatory and there are assessments every week. Make sure you set an alarm (and a backup alarm) so you get to class on time. 7:25am is early…but Doc. A will bring ALL THE ENERGY.
- **Set up canvas notifications** so that you receive and read all Canvas announcements.
- **Avoid Smokin' Notes**…seriously…don't get me started on how bad these are for *LEARNING*. Take your own notes…swap notes with friends in class for comparison…but for goodness' sake, don't spend extra money on notes for this class. Also, since this is my first time teaching the class and I'm creating all my own lectures and assessments, none of the prior term Smokin' Notes will align well.
- **Details matter!** This class will get into the nittiest of grittiest details about complex neuroscience concepts and structures. It is highly likely that there will be many times that the information will feel like TOO MUCH. In those moments, (a) take a breath, (b) remind yourself that there are weekly assessments and not cumulative unit exams, and (c) ask questions.

PERSONAL NOTE FROM DOC. A

This is my first time teaching this course, which is why we will have weekly assessments instead of cumulative unit exams—*this affords me a lot of flexibility with lecture timing*. Thank you in advance for any grace with regard to the weekly schedule. I'll do my best to stick to the dates/topics listed, but we might need to deviate a bit. If we get time, I will add a 4th unit on ***cognitive aspects of movement*** (Ch 27-29).

Also, it is important to me that you feel welcome in my class, and that you are comfortable communicating with me and your classmates. If your preferred name is not what shows on the official UF roll, please let me know—I can show you how to change it.