

NEUROMUSCULAR ASPECTS OF EXERCISE

APK4115 | Class # 28242 | 3 Credits | Fall 2024

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Course Info

INSTRUCTOR

DIEGO L. GUARIN, Ph.D.
Office: FLG139
Office Phone:
Email: d.guarinlopez@ufl.edu
Preferred Method of Contact: Email/Office

OFFICE HOURS

Monday 3:00 – 5:00 PM

MEETING TIME/LOCATION

WEIM 1094, MWF period 7 (1:55 PM – 2:45 PM)

COURSE DESCRIPTION

Provides an in-depth analysis of muscle structure and function; how muscles produce movement; adaptation of muscle to resistance training, endurance training, and various manipulations used in rehabilitations; adaptation of muscle to disuse; and muscle responses to injury.

PREREQUISITE KNOWLEDGE AND SKILLS

APK 3110c with a minimum grade of C and/or PET 3351c with a minimum grade of C. Some version of Human Anatomy and Physiology.

REQUIRED AND RECOMMENDED MATERIALS

All lecture slides and reading material will be posted on Canvas.

The course content is primarily derived from these books:

- Enoka, R. M. (2024). Neuromechanics of human movement. Human kinetics..
- Gardiner, P. (2024). Advanced neuromuscular exercise physiology. Human Kinetics.
- Vander, A. J., Sherman, J. H., & Luciano, D. S. (2001). Human physiology: the mechanisms of body function.

Acquiring these textbooks is not required as they are available for short-term use at the UF Libraries.

COURSE FORMAT

We will meet three times a week, during some meetings we will have standard lectures directed by the instructor, these lectures are linked to different chapters in books mentioned above. Students are expected to read those chapters before class and ask questions during the lectures. We will have in-class exams through the semester and a final exam covering all the class content. We will have in-class discussions after every exam to go over the questions and answers.

All exams will occur via Canvas, so please make sure you have a personal computer that you can bring to class and can access Canvas on it.

COURSE LEARNING OBJECTIVES:

Upon completion of this course, the student will be able to:

1. Knowledge: Discuss, explain, and defend subject matter relevant to neuromuscular physiology
2. Skills: Discuss, explain, and compare specific skills related to neuromuscular physiology
3. Professionalism: Present and explain vital, relevant concepts in neuromuscular physiology in a professional manner.

Course & University Policies

ATTENDANCE POLICY

Make every effort to attend all lectures. Attendances during lectures is not mandatory, though many concepts will be discussed only during class (and are not in the book) and will be part of your exams. Students that attend class tend to have better grades than those who don't.

Exams will be taken during in-class, you cannot participate in the exam if you are not physically in the classroom.

PERSONAL CONDUCT POLICY

Technology: The use of cell phones* (and the like) is strictly prohibited during lectures and exams. Any cell phone or other electronic device used during a quiz or exam will be considered a violation of the student honor code (i.e., cheating) and will result in stiff penalties. Laptop computers are welcome in class as long as you are using it for class-related work. Surfing the web, checking your email, using social media sites, or anything of that nature is strictly prohibited. Violation of this policy will result in point deductions at the discretion of the instructor.

Communication: You are responsible for checking announcements and course postings on Canvas. This is how your course instructor will communicate with you. All course grades will be posted on Canvas. Any discrepancies should be pointed out to the instructor on or before the last day of finals week.

Academic Honesty: 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 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.

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.

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.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session. Publication without permission of the instructor is prohibited.

To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

EXAM MAKE-UP POLICY

Unexcused absences on exam days will result in a zero on the exam. If you are ill or have an emergency that prevents you from taking the exam at the scheduled time, it is your responsibility to contact the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). Documentation of the illness or emergency will be required. The Dean of Students Office will contact me directly and request to organize a new exam. **Note that you will have one week to schedule a new exam, after one week of the exam, the grades will be released, and we will have an in-class discussion about the exam.** If you cannot re-schedule your exam within one week, please reach out to me so we can figure out an alternative evaluation method.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

ACCOMMODATING STUDENTS WITH DISABILITIES

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting their Get Started page at <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Accommodations are not retroactive; therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

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.

APK 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, rachaelseidler@ufl.edu
- Dr. Joslyn Ahlgren (she/her), APK Undergraduate Coordinator, jahlgren@ufl.edu

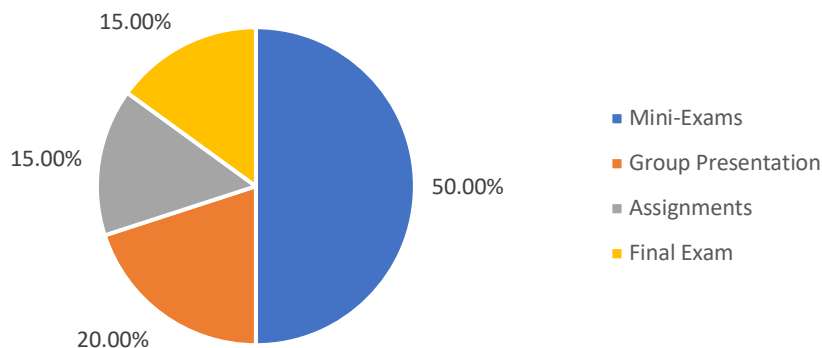
COURSE EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Grading

Evaluation Components (number of each)	Points Per Component	Approximate % of Total Grade
Mini-Exams (10)	5 pts each = 50 pts	50/100 = 50%
Group Presentation (1)	15 pts each = 15 pts	20/100 = 20%
Assignments (5)	3 pts each = 15 pts	15/100 = 15%
Final Exam (1)	15 pts each = 15 pts	15/100 = 25%

Grade Breakdown



Mini-Exams (10) 50%

There will be 10 mini-Exams, each valued at 5%. Mini-Exams will be taking during class using Canvas (using your personal laptop) under lockdown browser conditions. Questions will come from material (lectures and research papers) discussed in class since the previous quiz.

Questions format will be multiple choice questions and essay type questions. Mini-Exams are designed to be taken during the 45 min lecture.

Group Presentation (1) 20%

This presentation will be based on a research article that you and your team select. You will select a group (of 2 or 3 students), and the group will select a topic and a research paper related to that topic. Students should prepare a presentation about the paper. The length of the presentation should be between 10 to 15 minutes. Please do not go over 15 minutes as you will lose points. My suggestion is to practice the presentation several times before making a final presentation. Conciseness, clarity, and information delivery will be part of your grade. The group must then record the presentation and upload it into canvas. Please make sure the video file is properly uploaded and can be reproduced by others.

A detailed rubric of how your presentation will be evaluated is available in canvas.

Assignments (5) 15%

The Assignments are designed to help you plan and execute your group presentation. Four of the assignments are directly involved with your presentation and the last assignment is focused on providing feedback to the presentations of your peers.

Assignment 1 (Group Assignment). In this assignment you must select a team and your team must select a topic of interest.

Assignment 2 (Group Assignment). In this assignment, your team must select a research paper. You will have the opportunity to read multiple papers and select one for your presentation.

Assignment 3 (Group Assignment). In this assignment, your team must provide a summary of the paper. The summary must identify the paper's objective (s), hypothesis, methods, and results. Please do not simply copy/paste the paper abstract or use Generative AI to create your paper's summary. You must read the paper and make sure you understand its content.

Assignment 4 (Group Assignment). In this assignment, your team must submit the slides that will be used during your presentation.

Assignment 5 (Individual Assignment). In this assignment, you must select **two** of the presentations uploaded by your peers and provide constructive criticism about the presentation. For this, you **MUST** read the paper discussed in the presentation and provide a critique to the presentation. Critiques must be respectful and focused.

Additional details related to each assignment are available in canvas.

Final Exam (1) 15%

The final exam is cumulative. The structure of the final exam will be similar to that of the Mini-Exams but longer in duration and more comprehensive. The exam will be virtually taken using Canvas under lockdown browser conditions.

Extra points 10% (optional, not a class requirement)

Each student will have the opportunity to earn up to 10 extra points by preparing and recording a short (social media) video about their paper. Students can work in groups (same groups as the Group Presentation) or individually. The video must be short (up to 1 minute) and convey the most important points of the paper. The following criteria will be used to evaluate your video.

- Duration: Videos longer than 1 minute will not be considered.
- Language: Videos should be targeted to a general audience. Avoid using jargon and uncommon words.
- Style: Videos should be engaging. I should be *glued* to the screen for the duration of the video.
- Information: Videos should be factual and present the most important points of the research paper in a concise and clear manner

You can post your video in social media. Please let me know if the video becomes viral, that might influence your grade 😊.

GRADING SCALE

The total points earned from the exam, lab assignments, and participation will be summed. There is no curve for this course. I reserve the right to round up grades for students who show exceptional participation in class.

Letter Grade	Points Needed to Earn Each Letter Grade	Percent of Total Points Associated with Each Letter Grade	GPA Impact of Each Letter Grade
A	≥ 93.00	93.00-100%	4.0
A-	90.00-93.00	90.00%-92.99%	3.67
B+	87.00-89.99	87.00%-89.99%	3.33
B	80.00-86.99	80.00%-86.99%	3.0
C+	77.00-79.99	77.00%-79.99%	2.33
C	70.00-76.99	70.00%-76.99%	2.0
D+	67.00-69.99	67.00%-69.99%	1.33
D	60.00-66.99	60.00%-66.99%	1.0
E	0-59.99	0%-59.99%	0

Weekly Course Schedule

This approximates what the semester will consist of. This outline is subject to change at any point during the semester.

WEEKLY SCHEDULE

	Day	Date	Content	Note
Week 1				
	Fri	23-Aug	Syllabus and Introduction	
Week 2	Mon	26-Aug	Membrane Potential and Synaptic Transmission	
	Wed	28-Aug		
	Fri	30-Aug		
Week 3	Mon	02-Sep	NO CLASS	
	Wed	04-Sep	Synaptic Transmission	
	Fri	06-Sep	Mini-Exam 1	Assignment 1 due
Week 4	Mon	09-Sep	Muscle Architecture and Mechanics	
	Wed	11-Sep		
	Fri	13-Sep		
Week 5	Mon	16-Sep	Mini-Exam 2	
	Wed	18-Sep	Electromyography	
	Fri	20-Sep		
Week 6	Mon	23-Sep	Mini-Exam 3	Assignment 2 due
	Wed	25-Sep	Motor Units	
	Fri	27-Sep		
Week 7	Mon	30-Sep	Mini-Exam 4	
	Wed	02-Oct	Fatigue	
	Fri	04-Oct		Assignment 3 due
Week 8	Mon	07-Oct	Mini-Exam 5	
	Wed	09-Oct	Involuntary/Voluntary Actions	
	Fri	11-Oct		
Week 9	Mon	14-Oct	Involuntary/Voluntary Actions	
	Wed	16-Oct	Mini-Exam 6	
	Fri	18-Oct	NO CLASS	

Week 10	Mon	21-Oct	Endurance Training	
	Wed	23-Oct		
	Fri	25-Oct		Assignment 4 due
Week 11	Mon	28-Oct	Mini-Exam 7	
	Wed	30-Oct	Resistance Training	
	Fri	01-Nov		
Week 12	Mon	04-Nov	Resistance Training	
	Wed	06-Nov	Mini-Exam 8	
	Fri	08-Nov	Aging	Presentation due
Week 13	Mon	11-Nov	NO CLASS	
	Wed	13-Nov	Aging	
	Fri	15-Nov	Mini-Exam 9	
Week 14	Mon	18-Nov	Clinical considerations	
	Wed	20-Nov		
	Fri	22-Nov	Mini-Exam 10	Assignment 5 due
Week 15	Mon	25-Nov	NO CLASS	
	Wed	27-Nov	NO CLASS	
	Fri	29-Nov	NO CLASS	
Week 16	Mon	02-Dec	Best Presentations	
	Wed	04-Dec	Questions from students	Last lecture

FINAL EXAM

WEIM 1094 – Thursday Dec, 12 – 3pm – 5pm

SUCCESS AND STUDY TIPS

Successful students in my class typically do the following:

1. Do not miss classes throughout the semester. A lot of the exam material are given in class. A significant amount of information is not on the slides or in the book.
2. Take the presentation very seriously and start preparing ahead of time. The group presentation requires anywhere from 10-15 hours of outside class work.
3. Read the exam questions carefully before answering.