

NEUROMUSCULAR ASPECTS OF EXERCISE

APK4115 | Class # 28242 | 3 Credits | Spring 2024

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Course Info

INSTRUCTOR

DIEGO L. GUARIN, Ph.D.
Office: FLG132
Office Phone:
Email: d.guarinlopez@ufl.edu
Preferred Method of Contact: Email

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, peer-reviewed research papers, and reading material will be posted on Canvas.

The textbooks which our course content is primarily derived are available for short-term use at the UF Libraries:

- Enoka RM. *Neuromechanics of Human Movement*. 5th edition. Champaign, IL: Human Kinetics, 2015.
- Vander, A. J., Sherman, J. H., & Luciano, D. S. (2001). *Human physiology: the mechanisms of body function*.

Acquiring these textbooks is not required.

COURSE FORMAT

We will meet three times a week, during some meetings we will have standard lectures directed by the instructor, in some of the meetings we will have presentations by some class members followed by a group

discussion/active learning session. We will have in-class quizzes that will take a full session, and a final exam covering all the class content.

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 quizzes. Your attendance will be mandatory on the presentation days, failing to attend the presentation will likely harm your grade.

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: On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Any student found violating this honor code will receive a zero for that exam or assignment and may be assigned other educational sanctions at the instructor's discretion. <https://sccr.dso.ufl.edu/process/student-conduct-code/>

EXAM MAKE-UP POLICY

Unexcused absences on presentation/quiz/exam days will result in a zero on the presentation/quiz/exam. If you are ill or have an emergency that prevents you from taking the quiz or making the presentation 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 presentation/quiz/exam. 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 requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who

must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

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/>.

Getting Help

HEALTH & WELLNESS

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575
- Counseling and Wellness Center: <https://counseling.ufl.edu/>, 352-392-1575
- Sexual Assault Recovery Services (SARS) - Student Health Care Center, 392-1161
- University Police Department, 392-1111 (or 9-1-1 for emergencies) <http://www.police.ufl.edu/>

ACADEMIC RESOURCES

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>
- Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling. <https://career.ufl.edu/>
- Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.
- Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>
- Student Complaints On-Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/> On-Line Students Complaints: <http://distance.ufl.edu/student-complaint-process/>

INCLUSION, DIVERSITY, EQUITY, AND ACCESSIBILITY RESOURCES

For suggestions or concerns related to IDEA, please reach out to any of the following:

- Dr. Linda Nguyen, APK IDEA Liaison, linda.nguyen@hhp.ufl.edu
- Dr. Rachael Seidler, APK Graduate Coordinator, rachaelseidler@ufl.edu
- Dr. Joslyn Ahlgren, APK Undergraduate Coordinator, jahlgren@ufl.edu

Grading

Evaluation Components (number of each)	Points Per Component	Approximate % of Total Grade
Quizzes (7)	5 pts each = 35 pts	35/100 = 35%
Active learning activities (15)	1 pts each = 15 pts	15/100 = 15%
Group Presentation (1)	25 pts each = 25 pts	25/100 = 25%
Final Exam (1)	25 pts each = 25 pts	25/100 = 25%

Quizzes (7) 30%

There will be 7 quizzes, each valued at 5%. Quizzes will be taking during class using Canvas (using your personal laptop). Questions will come from material (lectures, presentations, and research papers) discussed in class since the previous quiz.

There is a total of 8 quizzes programmed in the syllabus, you might skip one of these quizzes without affecting your grade. Alternatively, you can take all quizzes and I will discard the quiz with the lowest grade.

Group Presentation (1) 25%

This presentation will be based on a research article that I will provide for you. You will select your group (of 2, 3 or 4 students) and the group will select one paper from a list available in Canvas. The length of the presentation should be between 20 to 25 minutes. The 25-minute limit is strict, and you will be cut short if you go over time. My suggestion, therefore, is to practice the presentation ahead of time (several times). Conciseness, clarity, and information delivery will be part of your grade. After finishing the presentation, the group will lead a discussion activity with all the class. We will discuss questions/discussion points brought up by the class about the paper.

The following rubric will be used to evaluate your presentation:

- Duration: You will lose 2 points for each minute that your presentation goes over/under the time limit. For instance, if your presentation lasts for 16 minutes, you will lose 8 points of your grade.
- Clarity (50%): You must clearly present the concepts described on the paper so that other class members can understand your topic. If you are having issues understanding the paper, please reach out to the instructor for clarification.
- Proper use of audiovisual tools (25%): You must prepare a power point presentation and present it to the class. The slides must be clear, concise, and well designed. You should avoid reading from your slides and focus on presenting your content clearly. If you decide to add videos, please make sure the videos add new content and are needed to make your point.
- Discussion (15%): You must add a final slide (s) responding to the question: Why do we care? This slide must present a summary of the research and an analysis of why we care about it.
- Group Discussion (10%): Your team must lead a group discussion after the presentation is complete. The activity includes discussion points brought up by other class members.

Active learning activities (15) 15%

Each class member must read the research paper that will be presented in class and prepare questions/discussion points that will be discussed during the presentation day. The questions/discussion points

must be posted on Canvas at least 24h before the beginning of the presentation. You will be randomly selected during class to talk about your question/discussion point.

Final Exam (1) 25%

The final exam is cumulative. We will have a review session on the last day of classes. The structure of the final exam will be similar to that of the quizzes but longer in duration and more comprehensive. The exam will be virtually proctored and under lockdown browser conditions through Canvas.

Extra points 3% (optional, not a class requirement)

Each group will have the opportunity of earning up to 3 extra points by writing a critique/review of the paper they presented in class. The critique/review must be turned in up to two weeks after the day of the presentation, **late submission won't be accepted**.

Format: The critique/review can be up to two pages in length not including citations (0.5 inch margins all around, single space, font Arial 12 pts). The document must include all relevant citations in springer/nature or IEEE style.

Note that if your paper won't be reviewed if it does not follow the format.

Content: The review/critique must contain a cohesive description of the paper's limitations and how they affect the results/conclusions. You might use the in-class discussion as a starting point, but you should include your own ideas. All the points in your critique must be well supported by existing literature, please avoid making unsupported claims as those will hurt your final grade.

These additional resources might be useful:

<https://www.ucalgary.ca/live-uc-ucalgary-site/sites/default/files/teams/9/critique-or-reviews-of-research-articles-academic-genre.pdf>

<https://essaypro.com/blog/article-critique>

<https://writingcenter.uagc.edu/writing-article-critique>

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	Mon	8-Jan	Syllabus and Introduction	
	Wed	10-Jan	How to Present Scientific Data	
	Fri	12-Jan	Membrane Potential	
Week 2	Mon	15-Jan	NO CLASS	
	Wed	17-Jan	Synaptic Transmission	
	Fri	19-Jan	Quiz 1	
Week 3	Mon	22-Jan	Muscle Architecture and Mechanics	
	Wed	24-Jan	Muscle Architecture and Mechanics	
	Fri	26-Jan	Quiz 2	
Week 4	Mon	29-Jan	Electromyography	
	Wed	31-Jan	Electromyography	
	Fri	2-Feb	Quiz 3	
Week 5	Mon	5-Feb	Presentation - Group 1	
	Wed	7-Feb	Presentation - Group 2	
	Fri	9-Feb	Presentation - Group 3	
Week 6	Mon	12-Feb	Motor Units	
	Wed	14-Feb	Motor Units	
	Fri	16-Feb	Quiz 4	
Week 7	Mon	19-Feb	Presentation - Group 4	
	Wed	21-Feb	Presentation - Group 5	
	Fri	23-Feb	Presentation - Group 6	
Week 8	Mon	26-Feb	Involuntary/Voluntary Actions	
	Wed	28-Feb	Involuntary/Voluntary Actions	
	Fri	1-Mar	Quiz 5	
Week 9	Mon	4-Mar	Involuntary/Voluntary Actions	
	Wed	6-Mar	Involuntary/Voluntary Actions	
	Fri	8-Mar	Quiz 6	
Week 10	Mon	11-Mar	NO CLASS	
	Wed	13-Mar	NO CLASS	
	Fri	15-Mar	NO CLASS	
Week 11	Mon	18-Mar	Presentation - Group 7	
	Wed	20-Mar	Presentation - Group 8	
	Fri	22-Mar	Presentation - Group 9	
Week 12	Mon	25-Mar	Acute Adjustments	
	Wed	27-Mar	Acute Adjustments	
	Fri	29-Mar	Quiz 7	
Week 13	Mon	1-Apr	Presentation - Group 10	
	Wed	3-Apr	Presentation - Group 11	
	Fri	5-Apr	Presentation - Group 12	
Week 14	Mon	8-Apr	Chronic Adjustments	
	Wed	10-Apr	Chronic Adjustments	
	Fri	12-Apr	Quiz 8	
Week 15	Mon	15-Apr	Presentation - Group 13	

	Wed	17-Apr	Presentation - Group 14	
	Fri	19-Apr	Presentation - Group 15	
Week 16	Mon	22-Apr	Presentation - Group 16	
	Wed	24-Apr	Final Study Guide	Last lecture
	Fri	26-Apr	NO CLASS	

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 quiz and test 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 que quizzes/exam questions carefully before answering.
4. Come prepared to the review session before the exam.