

# NEUROMUSCULAR ASPECTS OF EXERCISE

APK4115 | Class # 28242 | 3 Credits | Fall 2023

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## Course Info

### INSTRUCTOR

**DIEGO L. GUARIN, Ph.D.**  
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Office Phone:  
Email: [d.guarinlopez@ufl.edu](mailto:d.guarinlopez@ufl.edu)  
Preferred Method of Contact: Email

### OFFICE HOURS

By appointment

### MEETING TIME/LOCATION

FLG 285, 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 textbook which our course content is primarily derived is available for short-term use at the UF Libraries: Enoka RM. *Neuromechanics of Human Movement*. 5th edition. Champaign, IL: Human Kinetics, 2015. Acquiring this textbook is not required but highly suggested.

## 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. Finally, we will have in-class quizzes that will take a full session.

## 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. Although attendance will not affect your grades directly, it could influence them indirectly. Numerous concepts that will be discussed only during class (and are not in the book) will be part of your weekly quizzes. Your attendance will be mandatory on the day assigned to your presentation and during quizzes.

### 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 instructor as soon as possible. Documentation of the illness or emergency will be required. It is in the discretion of the instructor to provide a make-up quiz/exam or count the next one twice. 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](mailto: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](mailto: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](mailto:linda.nguyen@hhp.ufl.edu)
- Dr. Rachael Seidler, APK Graduate Coordinator, [rachaelseidler@ufl.edu](mailto:rachaelseidler@ufl.edu)
- Dr. Joslyn Ahlgren, APK Undergraduate Coordinator, [jahlgren@ufl.edu](mailto:jahlgren@ufl.edu)

## Grading

| Evaluation Components<br>(number of each) | Points Per Component | Approximate % of Total<br>Grade |
|---|----------------------|---------------------------------|
| Quizzes (6)                               | 5 pts each = 30 pts  | 30/100 = 30%                    |
| Active learning activities (15)           | 2 pts each = 30 pts  | 32/100 = 32%                    |
| Group Presentation (1)                    | 20 pts each = 20 pts | 20/100 = 20%                    |
| Final Exam (1)                            | 25 pts each = 25 pts | 25/100 = 25%                    |

### **Quizzes (6) 30%**

There will be 6 quizzes, each valued at 5%. Quizzes will be in-class quizzes, you can take them using Canvas (using your personal laptop) or with pen and paper. One of the quizzes (Quiz 4) will be take home, it will be made available on Friday during class and will be due next Monday before class.

Questions will come from material (lectures, presentations, and research papers) discussed in class since the previous quiz.

### **Group Presentation (1) 20%**

This presentation will be based on a research article that I will provide for you. You will select your group (of 3 or 4 students) and the group will select one paper from a list available in Canvas. The length of the presentation should be 20 to 25 minutes and should be in the format of a powerpoint presentation. The 25-minute limit is strict, and you will be cut short if you go over your time. My suggestion, therefore, is to practice the presentation ahead of time. 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.

### **Active learning activities (15) 30%**

Each member of the class must read the research paper that will be presented in class, meet with the members of their group 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 and I will select some of the post to discuss during class. Your team will be judge based on the relevance/originality of the questions/discussion points; you will receive zero points if you replicate a previously posted question.

### **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.

## **GRADING SCALE**

Give students a brief description of your grading. Will exam scores be uploaded directly into canvas? About how long will it take to get grades posted for each assignment? What should students do if they feel there is an error in grading? *Do you round grades ever?* Etc. You MUST include a statement like: "More detailed information regarding current UF grading policies can be found here: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>." I also highly recommend including a statement along the lines of: *"Any requests for additional extra credit or special exceptions to these grading policies will be interpreted as an honor code violation (i.e., asking for preferential treatment) and will be handled accordingly."*

| 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 | Wed | 23-Aug | Syllabus and Introduction                |      |
|        | Fri | 25-Aug | Presenting Scientific Data               |      |
| Week 2 | Mon | 28-Aug | Introduction / Principles of Electricity |      |
|        | Wed | 30-Aug | Membrane Potential                       |      |
|        | Fri | 1-Sep  | Synaptic Transmission                    |      |
| Week 3 | Mon | 4-Sep  | Labor Day (no class)                     |      |
|        | Wed | 6-Sep  | Muscle Architecture and Mechanics        |      |
|        | Fri | 8-Sep  | Quiz 1                                   |      |
| Week 4 | Mon | 11-Sep | Muscle Architecture and Mechanics        |      |
|        | Wed | 13-Sep | Electromyography                         |      |
|        | Fri | 15-Sep | Presentation - Group 1                   |      |
| Week 5 | Mon | 18-Sep | Presentation - Group 2                   |      |
|        | Wed | 20-Sep | Presentation - Group 3                   |      |
|        | Fri | 22-Sep | Quiz 2                                   |      |
| Week 6 | Mon | 25-Sep | Presentation - Group 4                   |      |
|        | Wed | 27-Sep | Presentation - Group 5                   |      |

|         |     |        |                                  |                |
|---------|-----|--------|----------------------------------|----------------|
|         | Fri | 29-Sep | Motor Units                      |                |
| Week 7  | Mon | 2-Oct  | Motor Units                      |                |
|         | Wed | 4-Oct  | Presentation - Group 6           |                |
|         | Fri | 6-Oct  | Homecoming (no class)            |                |
| Week 8  | Mon | 9-Oct  | no class                         | Instructor out |
|         | Wed | 11-Oct | Presentation - Group 7           |                |
|         | Fri | 13-Oct | Quiz 3                           |                |
| Week 9  | Mon | 16-Oct | Presentation - Group 8           |                |
|         | Wed | 18-Oct | Voluntary Actions                |                |
|         | Fri | 20-Oct | Reflexes and Automatic Responses |                |
| Week 10 | Mon | 23-Oct | Presentation - Group 9           |                |
|         | Wed | 25-Oct | Presentation - Group 10          |                |
|         | Fri | 27-Oct | Quiz 4 -- Take Home              | Instructor out |
| Week 11 | Mon | 30-Oct | Presentation - Group 11          |                |
|         | Wed | 1-Nov  | Presentation - Group 12          |                |
|         | Fri | 3-Nov  | Presentation - Group 13          |                |
| Week 12 | Mon | 6-Nov  | Acute adjustments                |                |
|         | Wed | 8-Nov  | Acute adjustments - Fatigue      |                |
|         | Fri | 10-Nov | Veteran Day (no class)           |                |
| Week 13 | Mon | 13-Nov | Acute adjustments - Stress       |                |
|         | Wed | 15-Nov | Chronic Adaptations              |                |
|         | Fri | 17-Nov | Quiz 5                           |                |
| Week 14 | Mon | 20-Nov | Chronic Adaptations - Aging      |                |
|         | Wed | 22-Nov | Thanksgiving Break (no class)    |                |
|         | Fri | 24-Nov | Thanksgiving Break (no class)    |                |
| Week 15 | Mon | 27-Nov | Presentation - Group 14          |                |
|         | Wed | 29-Nov | Presentation - Group 15          |                |
|         | Fri | 1-Dec  | Quiz 6                           |                |
| Week 16 | Mon | 4-Dec  | Presentation - Group 16          |                |

|         |     |        |                        |  |
|---------|-----|--------|------------------------|--|
|         | Wed | 6-Dec  | Review                 |  |
|         | Fri | 8-Dec  | Reading Day (no class) |  |
| Week 17 | Thu | 14-Dec | Final Exam             |  |

### 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. Come prepared to the review session before the exam. Many concepts are clarified during the review session.