APK 6205C
Nature and Bases of Motor Performance
Fall 2017

Instructor: Dr. Evangelos A. Christou
Email: eachristou@ufl.edu
Office: FLG 132 E
Phone: 352-294-1719
Office Hours: By Appointment

Class Room: WEIL 0238
Class Days: M
Class Time: Period 6-8 (12:50-3:50 pm)

Course Overview

University of Florida Course Description: Principles relating to development of motor skill, with emphasis on conditions affecting its development and retention in activities.

This class will address the physiological principles that underlie current concepts in motor control and learning and their application to movement disorders.

Textbook

RM Enoka. Neuromechanics of Human Movement. 5th edition. Human Kinetics. ISBN 978-1-4504-5880-1 (optional – not required)

Handouts and review papers will be provided.

General Course Policies

Attendance: Make every effort to attend all lectures. Although attendance will not affect your grades directly, it could influence them indirectly.

Accommodations: Students requesting classroom or other special accommodations must first register with the Dean of Students Office—Disability Resource Center (DRC). The Dean of Students Office will provide documentation to the student who must then present the documentation to the instructor when requesting accommodation. For optimal consideration, you must see the professor within the first three days of class.

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 an exam will be considered a violation of the student honor code (i.e., cheating) and will result 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, making Facebook posts, 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.

Evaluations: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of the assessments will also be available to students at website.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies

Course Examinations and Grading

Activity/Assignment	Points
1. Quizzes x 10 (5% each)	50
2. Presentation	20
3. Final comprehensive exam	30
TOTAL POINTS	100

Overall Expectations
On average, the class structure will be as follows: 1) Lecture (1-1.5 Hours); 2) Quiz (20 min); 3) Presentation and Discussion (1 hour). Throughout the semester you will responsible for the following:
- Weekly quizzes that will cover the material of the previous week.
- A presentation of a researcher/review paper that will be assigned to you in the first day of class.
- A final comprehensive exam.

Grading will be based on weekly quizzes, presentation, and final exam.

Assignments

Quizzes (50%)
There will be a total of 11 quizzes and you will be allowed to drop one. Your quiz grade will be based on the highest 10 quizzes (each is 5 % of your total grade). These quizzes will comprise of about 5-10 multiple choice (or short answer) questions. These quizzes are intended to encourage reading and attendance. Questions will come from material (lectures and presentations) presented to you since the previous quiz.

Presentation (20%)
This presentation will be based on a research article that I will provide for you. At the first class you will sign-up to a presentation slot.

The length of the presentation should be 30 minutes and should be in the format of a powerpoint presentation. The 30 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. There will be a 20 minutes question-answer session after each presentation. This presentation will worth 20% of your course grade. Your grade will be the sum of my evaluation (50%) and that of your colleagues (50%). Your colleagues will evaluate your presentation and the average of all the evaluations will form 50% of your presentation grade. The other 50% will come from my evaluation.

Final Comprehensive Exam (30%)
This exam will cover the lectures and presentations for the whole class. It will comprise of short answer questions. This exam will count for 35% of your grade.

Grades: The total points earned from quizzes and presentation 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. However, under most circumstances GRADES WILL NOT BE ROUNDED UP!!! If you earn a 79.94%, you will receive a C+, not a B. The following grading scale will be used to assess students in this course. For more detailed information on current UF grading policies, see the undergraduate catalog web page:
www.registrar.ufl.edu/catalog/policies/regulationgrades

Letter Grade	Points Necessary for Each Letter Grade	Percent of Total Points	GPA Equivalent
A	93	93.00-100%	4.0
A-	90	90.00-92.99%	3.67
B+	87	87.00-89.99%	3.33
B	83	83.00-86.99%	3.0
B-	80	80.00-82.99%	2.67
C+	77	77.00-79.99%	2.33
C	70	70.00-76.99%	2.0
D+	67	67.00-69.99%	1.33
D	60	60.00-66.99%	1.0
E	<60	0-59.99%	0

Tentative Schedule

This is an approximation of what the semester will consist of. This outline is subject to change at any point during the semester. Please make a habit to check the CANVAS announcements regularly as this is where schedule changes will be posted.

Week	Date	Lecture Topic	Reading/Assign.
1	M – Aug 21	Syllabus explanation / Organization Introduction to course concepts How to present scientific data	
2	M – Aug 28	The Neuromotor system - overview Synaptic transmission Muscle Anatomy / Mechanics	
3	M – Sept 4	**No class – Labor Day**	
4	M – Sept 11	Types of muscle contraction	*Quiz 1:* Aug 28 material *Presentation 1*
5	M – Sept 18	Organization & activation of motor units	*Quiz 2:* Sept 11 material *Presentation 2*
6	M – Sept 25	Modulation of multi motor units	*Quiz 3:* Sept 18 material *Presentation 3*
7	M – Oct 2	Neural control of force	*Quiz 4:* Sept 25 material *Presentation 4*
8	M – Oct 9	Voluntary control of movement	*Quiz 5:* Oct 2 material *Presentation 5*
9	M – Oct 16	Motor output variability	*Quiz 6:* Oct 9 material *Presentation 6*
10	M – Oct 30	Reflexes & Fast Responses	*Quiz 7:* Oct 16 material *Presentation 7*
11	M – Nov 6	Acute Adjustments – Stress and Fatigue	*Quiz 8:* Oct 30 material *Presentation 8*
12	M – Nov 13	Chronic Adaptations – Aging	*Quiz 9:* Nov 6 material *Presentation 9*
13	M – Nov 20	Chronic Adaptations - Motor learning	*Quiz 10:* Nov 13 material *Presentation 10*
14	M – Nov 27	Quiz Presentations	*Quiz 11:* Nov 20 material *Presentations 11,12*
15	M – Dec 4	Presentations	*Presentations 13,14,15*
16	W – Dec 6	Roger Enoka lecture	
	F – Dec 8 W- Dec 13	**Reading Day** **FINAL 13C – Comprehensive Exam**	**FINAL** 12:30-2:30 pm

Presentation	Paper title
1	Neural control of lengthening contractions *Duchateau and Enoka 2016*
2	Rate Coding and the Control of Muscle Force *Enoka and Duchateau 2017*
3	Common Synaptic Input to Motor Neurons, Motor Unit Synchronization, and Force Control *Farina and Negro 2015*
4	Low-Frequency Oscillations and Control of the Motor Output *Lodha and Christou 2017*
5	The Roles of Vision and Proprioception in the Planning of Reaching Movements *Sarlegna and Sainburg 2009*
6	Computational principles of sensorimotor control that minimize uncertainty and variability *Bays and Wolpert 2007*
7	Muscle Reflexes in Motion: How, What, and Why? *Stein and Thompson 2006*
8	Stressor-induced increase in muscle fatigability of young men and women is predicted by strength but not voluntary activation *Keller-Rosset al. 2014*
9	Physical Activity, Aging, and Physiological Function *Harridge and Lazarus 2017*
10	Neural Correlates of Motor Learning, Transfer of Learning, and Learning to Learn *Seidler 2010*
11	Altered activation of the antagonist muscle during practice compromises motor learning in older adults *Chen et al. 2014*
12	Discharge characteristics of motor units during long-duration contractions *Pascoe et al. 2014*
13	Motor plan differs for young and older adults during similar movements *Casamento-Moran et al. 2017*
14	Declining performance of master athletes: silhouettes of the trajectory of healthy human ageing? *Lazarus and Harridge 2017*
15	Voluntary motor commands reveal awareness and control of involuntary movement *De Havas, Ghosh, Gomi, Haggard 2016*