

APK 3110c Physiology of Exercise and Training
Summer 2017
M, T, W, R, F - 9:30-10:45AM
3 Credits

Instructor: Blain Harrison, Ph.D., ATC, CSCS

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Course Description:

Exercise physiology can be defined as both a basic and an applied science that describes, explains, and uses the body's response to exercise and adaptation to exercise training to maximize human physical potential. We will study the immediate (short-term) and long-term effects of exercise on the metabolic, neuromuscular-skeletal, and cardiovascular-respiratory systems and on the human organism as a whole unit. The course will also include topics such as the role of exercise in health-related issues as well as physical training for fitness and sports performance. We will discuss current areas of research and controversies in exercise physiology.

Course Objectives:

Upon completion of this course students will be able to:

1. Understand the importance of studying exercise physiology for exercise professionals, athletic trainers, physical educators, coaches, and pre-professional clinicians.
2. Know that exercise physiology is concerned with both health and athletic performance.
3. Summarize the processes of cellular respiration for the production of ATP from carbohydrate, fat and protein fuel substrates.
4. Compare the relative use of carbohydrate, fat, and protein fuel substrates on the basis of intensity and duration of exercise.
5. Discuss the role of the major organ systems in the performance of various forms of exercise and the primary adaptations of the major organ systems to various forms of chronic exercise training.
6. Have a basic knowledge of aerobic and anaerobic metabolism and be able to differentiate between activities that are primarily aerobic or anaerobic.
7. Be able to identify the metabolic adaptations to endurance, sprint, and resistance training.
8. Understand the responses of the cardiovascular system during exercise and to exercise training.
9. Understand both the respiratory response and the factors that control breathing during exercise
10. Describe the role of skeletal muscle plays during exercise
11. Be familiar with the sliding filament model of muscle contraction and know the characteristics that differentiate fast twitch from slow twitch muscle fibers.
12. Know the effects of acute and chronic exercise on hormone (endocrine) secretion.

13. Understand the differences between aerobic exercise prescriptions for public health and the improvement of cardiorespiratory fitness, as well as understand how mode, intensity, duration, frequency of training are necessary components for improving fitness.
14. Be able to identify the primary physiological factors that determine anaerobic and endurance performance in athletes.
15. Understand basic concepts regarding the central and peripheral causes of fatigue.
16. Know the effects of acute and chronic training on maximal oxygen consumption, anaerobic capabilities, and muscle strength in children and adolescents.
17. Discuss the different techniques used by exercise professionals when prescribing exercise programs, subsequently followed by designing an individual exercise program based on the material learned in class.

Grading:

<u>Content</u>	<u>Approx Percent value</u>	<u>Approx point value</u>
Homework	15%	100 points
Semester Exam 1	15%	50 points
Semester Exam 2	15%	50 points
Semester Exam 3	15%	50 points
TopHat In-class Questions	10%	50 points
Final Exam Comprehensive	30%	100 points

Final Grade Scale:

Students will be graded based on the following grade cut-offs:

A- =90-92%	A = 93-100%	
B- =80-82%	B = 83-86%	B+ = 87-89.99%
C- =70-72%	C = 73-77%	C+ = 78-79.99%
D- =60-62%	D = 63-67%	D+ = 68-69.99%
E = <60%		

Required Textbooks:

Powers, S., and E. Howley. 2018. *Exercise Physiology: Theory and Application to Fitness and Performance*. 10th edition. New York: McGraw-Hill Companies.

Quizzes and Exams

There are eighteen homework assignments, three semester exams, and a final exam. The three semester exams will not be comprehensive; however, the final exam WILL be comprehensive. Lecture Exams and Assignments will be administered through Canvas utilizing the LockDown Browser. All exams will be taken during the scheduled class time and in the classroom and will be closed-book and closed-notes. All exams will be taken on **Canvas ONLY**. It is the students' responsibility to ensure that their computers will connect successfully to UF wifi prior to all exams. If a student forgets to bring a computer on days of an exam, he/she will have the opportunity to retrieve their computers and attempt to finish the quiz or exam in the remaining time available. **HARD COPIES OF QUIZZES AND EXAMS WILL NOT BE AVAILABLE.**

Please see your instructor at least 72 hours prior to your exam if circumstances arise that will prevent you from taking the exam. If you have a schedule conflict for an exam you must take the exam early and not after the scheduled exam. Missed Exams will be scored a zero with no make-up exams permitted. There are no acceptable excuses for missing the final examination at the date and time scheduled for this class other than final examination conflicts causing a re-assignment by the Registrar.

Class Attendance Policy

Students are expected to attend all classes and to have completed assigned reading prior to class as scheduled by the instructor.

Top Hat

We will be using the Top Hat (www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. Questions administered in class count towards your final grade. Each lecture will include approximately 5 questions worth 1 point each (as participation points). In-class TopHat questions will amount to 10% of your final grade.

You can visit the Top Hat Overview (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

An email invitation will be sent to you by email, but if don't receive this email, you can register by simply visiting our course

website: <https://app.tophat.com/e/198377>

Note: our Course Join Code is 198377

Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing.

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

Grading

Notification of final grades will be made by the Registrar or you may check your grade by using ISIS. Final grades will not be posted.

You must earn your grade! Grades will not be rounded!

Cell Phone Policy

Students in this course are expected to behave professionally, politely, and considerately. Cell phone use with regard to phone conversations, text messaging, and social media use during lectures, labs, and exams is banned in this class. Smartphone or tablet devices may be used to participate in discussions and answer questions administered through TopHat.

Honor Code

It is the responsibility of Longwood University students to adhere to the Honor Code and conduct themselves to the highest standards of integrity. Students are deemed honorable unless their conduct proves otherwise. As a member of the University community, you are expected to live by the Honor Code and to pledge all class work. Please note that plagiarism is a violation of the Honor Code. Penalties for violation of the honor code are at the discretion of the instructor and can range from a 0 for the work where the violation occurred to an "F" for the course.

Accommodation of Special Needs

In accordance with university policy, I make every effort to accommodate unique and special needs of students with respect to speech, hearing, vision, seating, or others disabilities. Please notify the [Office of Disability Services](#) to register for services.

Academic Honesty

Cheating will not be tolerated in this course. All students are required to abide by the Academic Honesty Guidelines and Honor Code, which have been accepted by the University. Cheating is defined as the improper taking or tendering of any information or material, which shall be used to determine academic credit. Violations of the Honor Code will be handled according to the guidelines set by Student Judicial Affairs. UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. 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." The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with me.

Accommodations for students with disabilities

Students with disabilities requesting accommodations should first register with the DisabilityResource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester

Online course evaluation process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations 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 these assessments are available to students at <https://evaluations.ufl.edu/results/>. 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
The University of Florida has enacted a policy of allowing NO food or drink of any kind in any campus classroom. This policy will be enforced during the meeting times of this course.

APK 3110c - Class Schedule

Please note that the instructor reserves the right to alter the syllabus or schedule if it is determined that such a change will benefit the course and the students.

Module	Dates	Topic	Chapter In Text
1		Common Measurements in Exercise Physiology Control of the Internal Environment Bioenergetics	Ch. 1 Ch. 2 Ch. 3
2		Exercise Metabolism (Oxygen debt & deficit, VO ₂ max, LT) Cell Signaling and the Hormonal Responses to Exercise The Nervous System: Structure and Control of Movement NO CLASS: Tuesday July 4, Independence Day Semester Exam 1: Chapters 1-5, Thursday, July 6	Ch. 4 Ch. 5 Ch. 7
3		Skeletal Muscle: Structure and Function Circulatory Responses to Exercise Respiration During Exercise	Ch. 8 Ch. 9 Ch. 10
4		Acid-Base Balance During Exercise Temperature Regulation The Physiology of Training Semester Exam 2: Chapters 7-12, Thursday, July 20	Ch. 11 Ch. 12 Ch. 13
5		Factors Affecting Performance Laboratory Assessment of Human Performance Training for Performance	Ch. 19 Ch. 20 Ch. 21
6		Training Considerations in Special Populations Nutrition, Body Composition, and Performance Exercise and the Environment Semester Exam 3: Chapters 13,19-22, Tuesday, August 1	Ch. 22 Ch. 23 Ch. 24

Final Exam: Friday August 4, 2017