

 FLORIDA ATLANTIC UNIVERSITY	COURSE CHANGE REQUEST Graduate Programs		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner _____ Catalog _____
	Department Exercise Science & Health Promotion College Science		
Current Course Prefix and Number PET 6356		Current Course Title Human Systems Physiology in Exercise Science	
Syllabus must be attached for ANY changes to current course details. See Guidelines . Please consult and list departments that may be affected by the changes; attach documentation.			
Change title to: Advanced Exercise Physiology 2 Change prefix From: PET To: APK Change course number From: 6356 To: 6116 Change credits* From: No Change To: _____ Change grading From: No Change To: _____ Academic Service Learning (ASL) ** Add <input type="checkbox"/> Remove <input type="checkbox"/>		Change description to: No Change Change prerequisites/minimum grades to: No Change Change corequisites to: No Change Change registration controls to: No Change	
* Review Provost Memorandum ** Academic Service Learning statement must be indicated in syllabus and approval attached to this form.		Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.	
Effective Term/Year for Changes: Fall 2022		Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Christopher Boerum/cboerum@fau.edu/954-892-8001			
Approved by Department Chair _____ College Curriculum Chair _____ College Dean <i>William David Kalie</i> _____ UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____		Date _____ 2-28-22 2-28-22 03-14-22 _____ _____ _____ _____ _____	

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.



COLLEGE OF SCIENCE
DEPARTMENT OF EXERCISE SCIENCE & HEALTH PROMOTION
APK 6116 001: Advanced Exercise Physiology 2 CRN 11681 - 3 Credit Hours
Distance Education (online)
Fall 2022

Instructor: TBD
Office Hours: TBD
E-mail: TBD
Cell Phone: TBD

COURSE DETAILS

Course Description: A comprehensive examination of the of major organ systems contributing to the physiological response to exercise, both acute and chronic. Specifically, this course focuses on three of these systems: cardiovascular, pulmonary, and neuromuscular.

Required Text:

Hershel Raff, Michael Levitsky. (2011). *Medical Physiology: A Systems Approach*. (First Edition) New York, NY: McGraw-Hill. ISBN: 9780071621731, ISBN-10: 0071621733

Course Competencies/Objectives: The learning experiences and activities in the course are designed to enable the student to:

- Demonstrate an understanding of the basic cardiac structure and function, the pathway of blood flow, cardiac cycle, and vessel morphology
- Demonstrate an understanding of myocardial excitation contraction coupling and regulation of cardiac inotropy
- Demonstrate an understanding of the phases of cardiac action potentials and the mechanisms of neural influence on heart rate
- Understand the mechanics of the heart as a pump and the determinants of cardiac output
- Demonstrate an understanding of the physical principles of blood flow, arterial pressure regulation, and the properties of vascular smooth muscle
- Demonstrate an understanding of the cardiovascular responses to exercise
- Demonstrate an understanding of the function, structure, and mechanics of the respiratory system
- Describe the principles of alveolar ventilation, pulmonary perfusion, ventilation-perfusion relationships, and respiratory gas exchange
- Understand the physiology of oxygen and carbon dioxide transport, buffer systems, and the effects of altitude on the respiratory system
- Demonstrate an understanding the factors that regulate respiration
- Develop an understanding of neuronal structure and function and the ionic basis of neuronal action potentials
- Describe motor unit activation, skeletal muscle structure and function, fiber type differentiation, and neuromuscular adaptations to strength and endurance training
- Understand the molecular bases of training adaptations based on specificity of training

COURSE DELIVERY MODE

Fully Online: This is a fully online course with no in-person lectures and no scheduled livestream lectures. The entire course will be delivered via Canvas and it is your responsibility to stay up to date on the assigned lectures and corresponding assessments/assignments. Announcements will be made periodically throughout the course to remind you of important due dates and any changes to the syllabus schedule. Again, it is your full responsibility to stay up to date regarding the course schedule. Assignments, exams, and quizzes that are not submitted by the required due date will result in a grade of zero.

***Netiquette:** Due to the casual communication common in the online environment, students are sometimes tempted to relax their grammar, spelling, and/or professionalism. Please remember that you are adult students and professionals—your communication should be appropriate. For more in-depth information, please see the [FAU statement on netiquette](#).*

Office Hours: Office hours will be held virtually by appointment. Please send me an email to set up a meeting time and discuss further arrangements. I am generally available Monday through Friday and should be able to reasonably accommodate your meeting request. For any general questions/inquiries you can directly email me or message me through Canvas at any time. I am more than happy to help and will do my best to respond in a timely manner.

Time Commitment Per Credit Hour:

This is a (3) credit-hour course. It is expected that the average student in this course will need to spend 2-3 hours per credit hour in out-of-class assignments each week. Thus, it is assumed that the average student will spend 6-9 hours each week on out-of-class assignments, plus 3 hours of online class time, for a total of 9-12 hours spent on coursework each week.

Online learning is NOT for everyone; some individuals may not be able to manage a course that does not meet face to face. Online learning requires A LOT of planning as well as self-pacing for success. As late assignments are NOT accepted, you MUST “keep up” with the course material by consistently participating each week to ensure timely completion of all coursework.

COURSE EVALUATION/POLICIES

Your final grade will be calculated as follows:

A.) 3 Exams (100 points each)	300 points
B.) 6 Quizzes (15 points each)	90 points
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Total Points	390 points

A. 3 Exams : 100 points each

The exam will cover information based on PowerPoint/video lectures and the book. Tests will primarily be multiple-choice and short answer/essay. If the student does not contact the instructor before missing an exam, a grade of “0” will be recorded. If an exam is not made up within three days, a grade of “0” will be recorded. Exams are always due at the end of the week on Sunday by 11:59pm with exception of the Final Exam. The final exam is due at the end of the university assigned exam window.

B. 6 Quizzes: 15 points each

There will be 6 graded quizzes and 1 extra credit quiz worth 15 points each. Quizzes are due at the end of the week (Sunday at 11:59pm) and are usually based on the assigned readings for that same week unless otherwise stated.

Grading Scale:

A = 92%+,	A ⁻ = 90-91.99%	
B ⁺ = 87-89.99,	B = 82-86.99%,	B ⁻ = 80-81.99%
C ⁺ = 77-79.99%,	C = 72-76.99%,	C ⁻ = 70-71.99%
D ⁺ = 67-69.99%,	D = 62-66.99%,	D ⁻ = 60-61.99%
F = 0-59.99%		

Late Assignments Policy:

Failure to submit assignments, quizzes, and exams by the scheduled due date will not be graded and will result in a grade of **zero**. It is the student’s responsibility to stay up to date with all due dates and deadlines.

Make-Up Policy For Assignments:

Students are expected to complete and submit all assignments as scheduled. Prior approval by the instructor is required in order to make up any assignment. Students will only be allowed to make up an assignment for legitimate class absences as specified in the University’s Academic Policies and Regulations. Students must contact the instructor a minimum of 48 hours prior to missing a scheduled assignment (or as soon as possible in extreme circumstances) in order to reschedule a date to make up a missed assignment, AND appropriate documentation must be submitted to the instructor prior to the make-up. Make-ups must be completed within one week of the missed assignment. Failure to comply with this policy will result in a grade of “zero” being recorded for the missed assignment. The University’s Academic Policies and Regulations are specified on FAU’s website: [FAU Registrar](#).

Incomplete Grade Policy:

The University policy states that a student who is passing a course, but has not completed all work due to exceptional circumstances, may, with consent of the instructor, temporarily receive a grade of incomplete (“I”). The assignment of the “I” grade is at the discretion of the instructor, but is allowed only if the student is passing the course.

COURSE SCHEDULE

Week/Module	Course Materials/Topics	Readings and Quizzes (Due 11:59pm by the end of the week)
Week 1: 8/20/22	Introduction to CV system: Basic cardiac structure and function, pathway of blood flow, cardiac cycle, vessels, myocardial cells, excitation contraction coupling, regulation of cardiac inotropy	
Week 2: 8/29/22	Regulation of HR and Electrical Activity of the Heart: Cardiac action potentials, neural influence on heart rate, membrane potential and the phases of the cardiac action potential	--Readings: textbook pages 54-57, 199-207, and chapter 23 --Quiz 1 (based on readings)
Week 3: 9/5/22	The Heart as a Pump: Determinants of cardiac output, preload and afterload, nervous and humoral factors, Fick Principle, etc.	--Readings: textbook chapter 24 --Quiz 2 (based on readings)
Week 4: 9/12/22	The Arterial System: Pulsatile and steady flow, stroke volume, pulse pressure, TPR, BP, etc., regulation of vascular smooth muscle, physical principles of blood flow, endothelium and capillary filtration	--Readings: textbook pages 254-262 and chapter 27 --Quiz 3 (based on readings)
Week 5: 9/19/22	Cardiovascular Responses to Exercise: Redistribution of blood flow, cardiovascular control, rapid & slow responses, skeletal muscle pump, determinants of preload/afterload, factors affecting cardiac output, effects of training	--Readings: Physiologic responses to exercise PDF --Quiz 4 (based on readings)
Week 6: 9/26/22	EXAM 1	Exam 1 due by 11:59pm on Sunday, 10/2/22
Week 7: 10/3/22	Function/Structure, Mechanics & Alveolar Ventilation: Basic pulmonary mechanics of ventilation, measures of respiratory volumes/capacities	--Readings: textbook chapters 31, 32 and 33 --Quiz 5 (based on readings)
Week 8: 10/10/22	Pulmonary Perfusion & Respiratory Gas Exchange: Pulmonary vascular resistance, ventilation-perfusion relationships, regional differences, pulmonary gas diffusion	--Readings: textbook chapters 34 and 35
Week 9: 10/17/22	Principles of Gas Transport: Transport of oxygen and carbon dioxide, oxyhemoglobin dissociation curve, buffer systems, acidosis and alkalosis, effects of altitude	--Readings: textbook chapters 36 and 37
Week 10: 10/24/22	Regulation of Respiration: neural influences of respiration, chemoreceptors, the pulmonary response to exercise	--Readings: textbook chapters 38, Respiratory Limitations of Exercise Performance PDF, Tracking Pulmonary Gas Exchange PDF
Week 11: 10/31/22	EXAM 2	Exam 2 due by 11:59pm on Sunday, 11/6/22
Week 12: 11/7/22	The Motor Neuron: Neuronal structure and function, ionic basis of the neuronal action potential and synaptic transmission, motor unit activation, muscle fiber types	--Quiz 6 (based on lecture) – EXTRA CREDIT
Week 13: 11/14/22	Skeletal Muscle: Skeletal muscle structure and function, excitation contraction coupling, skeletal muscle adaptations to resistance training, fiber types, neuromuscular adaptations, effects of strength vs endurance training	--Readings: textbook chapters 8 and 9 --Quiz 7 (based on readings)
Weeks 14 & 15 Combined: Mon 11/21/22 – Saturday 12/3/22	Thanksgiving Break 11/24 – 11/27 Molecular Adaptations to Training in Skeletal Muscle: Specificity, primary and secondary messengers in cell signaling, molecular pathways, cytokines, mitochondria, etc.	
Reading Days: 12/5 – 12/7		
Final Exam Window (12/8/22 – 12/14/22)	EXAM 3 (Final Exam)	Exam 3 Due by 11:59pm on Wednesday, 12/14/22

TECHNOLOGY AND COMPUTER REQUIREMENTS

HARDWARE & SOFTWARE REQUIREMENTS

Students that do not have or are unable to obtain the required technologies described below are expected to access the course materials using a University computer located in any of FAU's libraries or computer labs.

Hardware

- Dependable computer
- Computer speakers
- Headset with microphone (recommended for on-line video conferencing)
- Webcam (recommended for on-line video conferencing)

Software

- [Microsoft 365 Suite](#)
- Reliable web browser (recommended [Chrome](#) or [Firefox](#))
- Canvas mobile app: Download instructions for [iOS device](#) or [Android device](#)
- [Adobe Reader](#)
- [Adobe Flash Player](#)

Internet Connection

- Recommended: Broadband Internet connection with a speed of 4 Mbps or higher.
- To function properly, Canvas requires a high-speed Internet connection (cable modem, DSL, satellite broadband, T1, etc.). The minimum Internet connection speed to access Canvas is a consistent 1.5 Mbps (megabits per second) or higher.
- [Check your Internet speed here.](#)

COMPUTER REQUIREMENTS

Basic Computer Specifications for Canvas

- Operating system: Windows 10 or macOS Sierra (or higher).
- [Specifications](#)

Peripherals

- A backup option should be available to minimize the loss of work. This can be an external hard drive, a USB drive, cloud storage, or your folder on the FAU servers.

Software

- Once logged in to Canvas make sure your Internet browser is compatible.
- Other software may be required for specific learning modules. If so, the necessary links to download and install will be provided within the applicable module.

MINIMUM TECHNICAL SKILLS REQUIREMENTS

The general and course-specific technical skills you must have to succeed in the course include but are not limited to:

- Accessing the Internet.
- Using Canvas (including taking tests, attaching documents, etc.).
- Using email with attachments.
- Creating and submitting files in commonly used formats (e.g., Microsoft Office).
- Copying and pasting.
- Downloading and installing software.
- Using presentation, graphics, and other programs.

- Posting and commenting in online discussions.
- Searching the FAU library and websites.

TECHNICAL SUPPORT

In the online environment, technical issues are always possible (e.g., lost connection, hardware or software failure). Many of these can be resolved relatively quickly, but if you wait until the last minute before due dates, the chances of these glitches affecting your success are greatly increased. Please plan appropriately. If a problem occurs, it is essential you take immediate action to document the issue so your instructor can verify and take appropriate action to resolve the problem. Most issues in Canvas can be resolved by clicking on the “Help” tab located on the menu bar. When a problem occurs, click “Help” to:

- Report a Problem
- Live Chat with Canvas Support
- Search Canvas Guides

Additional Technical Support

1. Contact the eLearning Success Advisor for assistance: 561-297-3590
2. Take a screenshot of the display when the problem occurs. Save the screenshot as either a .jpg or a .png file. If you are unfamiliar with how to create a screenshot file, please see [Print Screen Instructions](#).
3. Complete a [Help Desk ticket](#). Make sure you complete the entire form and give a complete description of your problem so the Help Desk staff will have the pertinent information in order to assist you properly. Steps to follow include:
4. Select “Canvas (Student)” for the Ticket Type and input the Course ID.
5. In the Summary/Additional Details section, include your operating system, Internet browser, and Internet service provider (ISP).
6. If available, attach the screenshot file.
7. Send an email or message within Canvas to your instructor to notify him/her of the problem. Include all pertinent information of the incident.
8. If you do not have access to a computer, call your instructor with all pertinent information of the incident. If he/she is not available, leave a detailed message.
9. If you do not hear back from the Help Desk or your instructor within 48 hours, it is your responsibility to follow up with the appropriate person until you obtain a resolution.

UNIVERSITY AND COURSE POLICIES

COVID-19 STATEMENT: Due to the surge in COVID-19 cases and the omicron variant, all students regardless of vaccination status are expected to wear masks while indoors in any FAU facilities, including classrooms and laboratories. Students experiencing flu-like symptoms (fever, cough, shortness of breath) or students who have come in contact with confirmed positive cases of COVID-19 should immediately contact FAU Student Health Services (561-297-3512). Symptomatic students will be asked to leave the classroom to support the safety and protection of the university community. For additional information visit www.fau.edu/coronavirus.

In classes with face-to-face components, quarantined students should notify me immediately as you will not be able to attend class. I will not be able to offer an online version of the class but will make reasonable efforts to assist students in making up the work.

UNIVERSITY ATTENDANCE POLICY: Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a university-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

STUDENTS WITH DISABILITIES: In compliance with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS) CENTER: Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counselling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to www.fau.edu/counseling/

CODE OF ACADEMIC INTEGRITY: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 - https://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf

PLAGIARISM

[Plagiarism](#) is unacceptable in the University community. Academic work must be an original work of your own thought, research, or self-expression. When students borrow ideas, wording, or organization from another source, they must acknowledge that fact in an appropriate manner. Plagiarism is the deliberate use and appropriation of another's work without properly identifying the source and trying to pass off such work as one's own. Students who present ideas/material (in ANY form) and fail to give full credit for such ideas/material taken from another have plagiarized. If in doubt, cite your source.

The instructor reserves the right to adjust the syllabus as necessary.