

UNIVERSITY OF PITTSBURGH
Department of Health and Human Development (SPRING 2025)

HPA 2382: Clinical Exercise and Physical Activity Physiology 2

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GENERAL COURSE DESCRIPTION: This is the second course in a sequence of advanced courses in clinical exercise physiology. This course will expand on knowledge of pathophysiology and special considerations for clinical populations by going into depth with clinical exercise testing, EKG interpretation, clinical exercise prescription including medication effects, and emergency procedures. The aim is to provide all of the knowledge and skills necessary for conducting diagnostic and functional cardiopulmonary evaluations and exercise programs for clinical patients.

PREREQUISITES: Undergraduate course in Exercise Physiology and/or admittance into the Master's Program. Clinical Exercise Physiology 1 (HPA 2381) preferred.

RECOMMENDED TEXT:

- ACSM's Guidelines for Exercise Testing and Prescription, Eleventh Edition. Wolters Kluwer: Philadelphia, 2021.
- ACSM's Fitness Assessment Manual, 6th Edition. Wolters Kluwer: 2021
- ACSM's Clinical Exercise Physiology. Eds. Ehrman, Gordon, Visich, and Keteyian, Human Kinetics: Champaign, IL, 2023. (Same Books as Fall)
- Dale Dubin (2000). Rapid Interpretation of EKG's. (6th Ed.). Tampa: COVER Publishing Company.

SPECIFIC STUDENT COMPETENCIES/OBJECTIVES:

The course activities, experiences, assignments, and sequence are intended to provide opportunities for class members to accomplish specific course objectives, which include:

1. Explain the value of the GXT (graded exercise test) /CPX (cardiopulmonary exercise test) in terms of utility, sensitivity, and specificity
2. Identify the various GXT protocols, advantages and disadvantages of each, how to use them.
3. Understand the normal and abnormal physiological adaptations that occur during a GXT.
4. Know the absolute and relative contraindications to the GXT and exercise prescriptions.
5. Be able to interpret GXT and EKG results to appropriately prescribe exercise.
6. Identify commonly used medications for clinical conditions and their effects on exercise responses and capacities.

7. Explain and know the major cardiovascular, pulmonary, diabetic drugs and the effect they have on the GXT and prescription.
8. Know the pharmacokinetics of antianginal, antihypertensive, and hypercholesteremic drugs.
9. Identify the warning signs of a heart attack, know normal emergency equipment and procedures available during exercise testing, and list basic steps in a cardiac emergency.
10. Explain the electrophysiology behind the EKG and interpret a normal and abnormal resting EKG
11. Identify various arrhythmias, blocks, hypertrophies, injuries, infarcts, and ischemic conditions from EKG's.
12. Identify EKG and cardiovascular changes during the GXT and explain the appropriate responses.

COURSE TOPICS: The student will be exposed to the following topics in this course:

1. Electrocardiography
2. Clinical Cardiopulmonary Exercise Testing and Prescription
3. Medication effects on testing and prescription
4. Emergency Procedures required by the CEP
5. Recommendations for exercise testing, programming, and rehabilitation
6. Special considerations that may impact exercise testing and programming (e.g. environmental factors, nutritional status, cognition, etc.)

This course will use a lecture-based format with synchronous reviews, case studies, discussions, and **weekly quizzes** to ensure comprehension and synthesis of material. Students are required to assume partial responsibility for learning material through reviewing PowerPoint lectures, notes, and recommended readings. There will be no exams in this course.

ACADEMIC INTEGRITY POLICY:

Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, noted below, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz, exam or paper will be imposed. (For the full Academic Integrity policy, go to www.provost.pitt.edu/info/ai1.html.)

DISABILITY RESOURCE SERVICES:

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-383-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

MISCELLANEOUS ISSUES

Any student caught cheating (includes any form of academic dishonesty such as copying answers, taking quizzes/exams with another students, plagiarism, etc.) will result in an automatic "F" in this course. Additionally, the student will be reported to the appropriate university officials, and it will go on file in the student's academic record. The academic integrity form must be signed prior to taking this course and can be found on the CourseWeb page under the Academic Integrity Tab.

GRADING SCALE

Your grade will be determined by dividing your actual points by the total number of points attainable.

GRADES:	APPROXIMATE POINT VALUE*
WEEKLY QUIZZES @ 10pts x 12 weeks	Approximately 120 Points Total
ASSIGNMENTS	50-100 Points
RAPID EKG – 'ON THE SPOT and Under Pressure'	10 Points Total

The following grading scale will be used to determine final course grades.

A	=	90-100%
B+	=	87-89.9%
B	=	80-86.9%
C+	=	77-79.9%
C	=	70-76.9%
D+	=	67-69.9%
D	=	60-66.9%
F	=	0-59.9%

Incomplete or G Grades

Students must complete all course requirements to receive a grade for this course. In the event of extenuating personal circumstances, such as a medical emergency or a death in the family, an I or G grade may be awarded to signify unfinished course work. *G grades will not be an option for students who fall behind in the course for non-emergency reasons.* Students assigned I or G grades are required to complete course requirements no later than one year after the term in which the course was taken. After the deadline has passed, the I or G grade will remain on the record, and the student will be required to reregister for the course if it is needed to fulfill requirements for graduation.

ATTENDANCE POLICY

Attendance is highly recommended for graduate level courses. If a class is to be missed, good communication prior to the missed class is expected. **There will be no make-ups for quizzes or assignments unless prior arrangements have been made with the instructor.** These must be made up within one week at a time and date approved by the instructor. In rare cases where unexpected (emergency) circumstances arise, it is the student's responsibility to notify the instructor immediately (i.e., within 48 hours) in order to ensure the possibility of a make-up exam or project.

Department of Health and Human Development Grievance Procedure:

If a student feels that they have been treated unfairly by the instructor with regard to their grade or other aspects of their course participation there are a series of steps that should be taken in an attempt to resolve this matter. These include the following:

1. The student should first inform the instructor of the course of the issue in an attempt to resolve this matter. If the course is taught by a Teaching Assistant, Graduate Student, or Part-Time instructor, their faculty supervisor should also be informed of this matter. The student should

bring this issue to the attention of the instructor in a timely matter and should maintain a record of interactions that occurred with the instructor regarding the matter in question. The course instructor should take necessary steps to address the concern raised by the student in a timely matter and should maintain a record of the interactions that occurred with the student regarding this matter.

2. If, after reasonable attempts to resolve the matter, the matter is not resolved in a manner that is deemed to be acceptable to the student, the student retains the right to file a grievance. This grievance is to be filed with the Department Chair in the form of a written document that can be submitted via email or campus mail. This document should include the following:
 - a. Student's name
 - b. Student contact information (email, address, telephone number)
 - c. Information on the course for which the grievance applies (course title, course number, instructor name).
 - d. A copy of the course syllabus that was provided to the student by the instructor
 - e. Detailed description of the grievance and additional information the student feels is pertinent to this matter.

After receiving this information the Department Chair will inform the student if additional information is needed, as appropriate will discuss this matter with the student and the instructor, and will issue a decision in a timely manner.

3. If the student is not willing to accept the decision of the Department Chair, the student will be informed that they can request an additional review of this matter through the Office of the Dean of the School of Education. If the student decides to pursue this, the student should contact the Associate Dean for Student Affairs & Certification in the School of Education at the University of Pittsburgh.

SPRING 2025 COURSE SCHEDULE

The following course schedule is tentative and may change at the discretion of the instructors.

You are responsible for any changes made to the syllabus that are posted.

DATE	MODULE TOPIC	RELATED READINGS	ASSESSMENTS
JANUARY 08	Introduction/Importance of Assessing CRF/Exercise is Medicine	Review Article from AHA	-
JANUARY 15	EKG Interpretation + Signs and Symptoms for Conditions	Guided Lecture Presentations and Dubin Textbook	-
JANUARY 22			QUIZ 1
JANUARY 29			QUIZ 2
FEBRUARY 05			QUIZ 3
FEBRUARY 12			QUIZ 4
FEBRUARY 19	EKG Interpretation	Ehrman Chp 5	QUIZ 5
FEBRUARY 26	Clinical Exercise Testing and Interpretation		QUIZ 6
MARCH 5	SPRING BREAK – NO CLASS	-	-
MARCH 12	Clinical Exercise Testing and Interpretation	Ehrman Chapters 3, 5 & 6 w/ ACSM Guidelines	QUIZ 7
MARCH 19	Exercise Test Results and Prescription + Exercise Pharmacology		QUIZ 8
MARCH 26	Exercise Test Results and Prescription + Exercise Pharmacology		QUIZ 9
APRIL 2	Exercise Pharmacology + Metabolic Equations + Pharmacology Presentations	-	QUIZ 10
APRIL 09	Metabolic Equations + Pharmacology Presentations	-	QUIZ 11
APRIL 16	Final Overflow Pharmacology Presentations as Needed	-	METABOLIC EQUATIONS QUIZ 12

Spring Break March 03rd – March 7th. **NO CLASS ON MARCH 5th**

*INTERPREATION QUIZZES IN CLASS INTERPRETATION BASED ON PACKETS OF EKG'S WORKED ON THE WEEK PRIOR. EKG PACKETS WILL BE PROVIDED BY THE INSTRUCTOR TO STUDENTS TO PRACTICE AHEAD OF CLASS.

*RAPID EKG: On the Spot and under pressure. Students will be randomly selected by instructors and asked to interpret an EKG 'on the spot'. This exercise is utilized to ensure comprehension and preparation for future work in the field which may include high pressure situations. The assessment is worth 10 points and will be administered at random throughout the semester during class. Students should be prepared for their rapid interpretation during the period of January 31st and March 14th. Scale for points of the rapid interpretation will be described.

*Completed EKG packets and participation/engagement in group-based discussion of case studies will be used to earn points on assignments.