UF Department of Applied Physiology and Kinesiology
College of Health and Human Performance
UNIVERSITY of FLORIDA

Extreme Environment Physiology

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APK6124 | 3 Credits | Fall 2025

Course Info

INSTRUCTOR	Christopher Brown, PhD, LAT, ATC, CSCS, TSAC-F, PES, OPE-C Clinical Associate Professor Clinical Education Coordinator, Doctor of Athletic Training Program Office Location: 122FLG Email: cdbrown7@ufl.edu
OFFICE HOURS	Office Hours: Will be held for 2 hours each week and the schedule will be posted on CANVAS. You can also schedule a direct appointment with me HERE.
MEETING TIME/LOCATION	Access course through Canvas on UF e-Learning & the Canvas mobile app by Instructure

COURSE DESCRIPTION

This graduate-level course is designed to examine the responses of the body during and after exposure to extreme environmental conditions. Topics will include high-altitude, deep-water diving, extreme temperature environments, microgravity/outer space, and high-stress environments. The course will also have sections detailing possible diseases and conditions relating to exposure to those extreme environments.

PREREQUISITE KNOWLEDGE AND SKILLS

No prerequisite knowledge or skills are required for this course. While not required, it is recommended students take APK6116 (or similar) to have a proper background in exercise physiology. Students may fall behind if they do not have a strong base of knowledge, from either undergraduate exercise physiology or APK6116, to draw upon as the semester progresses. Previous experience in the following areas may also be beneficial for this course: Anatomy; Athletic Training/Sports Medicine; Medical Terminology; Environmental Medicine.

REQUIRED AND RECOMMENDED MATERIALS

Textbook	ISBN	
Advanced Environmental Exercise Physiology Author: Cheung and Ainslie Publisher: Human Kinetics Year: 2021 Edition: 2nd	9781492593980	Required

Human Physiology in Extreme Environments (Psychology Module) Author: Gunga Publisher: Academic Press Year: 2021 Edition: 2nd	9780128159422	Recommended for Module 3 (if desired)
Space Physiology (Microgravity Module) Author: Buckley Publisher: Oxford Press Year: 2006 Edition: 1st	9780195137255	Recommended for Module 5 (if desired)
All other reading materials will be available on the class web page (E-Learning)		

COURSE FORMAT

This course will utilize a lecture and assignment approach. You will be able to watch lectures on CANVAS and participate in discussions/assignments within the CANVAS shell. I will provide PowerPoint slides for you to access for information about specific points. You will need to review this information as well as the information in the textbook and from alternative readings for this course. You will be expected to be active learners outside of the classroom.

COURSE LEARNING OBJECTIVES:

- Explain the physiological responses of the body during rest and exercise in hypobaric (high-altitude) and hyperbaric (underwater) environments.
- Explain the physiological responses of the body during rest and exercise in hypothermic (cold) and hyperthermic (hot) environments.
- Explain the physiological responses of the body during rest and exercise in micro-gravity (space).
- Explain the responses of the body during rest and exercise in extremes of psychological stress (Military; Firefighter; Isolation; etc.).
- Distinguish diseases and physiological conditions resulting from exposure to extreme temperature, pressure, gravity, and psychological stress.
- Discuss technological advances surrounding capturing human data in extreme environments and mitigating the effects of extreme environments.
- Critically evaluate scientific literature in exercise physiology in extremes.

University Policies

University policies and resources are summarized here.

Course & University Policies

PERSONAL CONDUCT POLICY

University of Florida students are bound by the Honor Pledge. On all work submitted for credit by a student, the following pledge is required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Student Honor Code and Conduct Code (Regulation 4.040) specifies a number of behaviors that are in violation of this code, as well as the process for reported allegations and sanctions that may be implemented. All potential violations of the code will be reported to Student Conduct and Conflict

Resolution. If a student is found responsible for an Honor Code violation in this course, the instructor will enter a Grade Adjustment sanction which may be up to or including failure of the course.

APPROPRIATE USE OF AI TECHNOLOGY

The UF Honor Code strictly prohibits *cheating.* The use of any materials or resources prepared by another person or Entity (inclusive of generative AI tools) without the other person or Entity's express consent or without proper attribution to the other person or Entity is considered *cheating.* Additionally, the use of any materials or resources, through any medium, which the Faculty / Instructor has not given express permission to use and that may confer an academic benefit to a student, constitutes *cheating*. The use of any AI enabled tool in this course substantially compromises the student's ability to achieve the stated learning objectives and are strictly prohibited throughout the entirety of the course.

IN-CLASS RECORDING

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session. Publication without permission of the instructor is prohibited.

To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

EXAM MAKE-UP POLICY

There will be NO make-up examinations unless exceptional conditions occur (as defined in the University of Florida Undergraduate Catalog). Prior permission from the professor is required. There will be a time limit for each examination. Examinations will evaluate the understanding of material from lecture, text, and other supplemental material provided. "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.

COURSE EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

1) The email they receive from GatorEvals,
2) Their Canvas course menu under GatorEvals,

3) The central portal
    a. Guidance on how to provide constructive feedback is available. Students will be notified when the evaluation period opens.
    b. Summaries of course evaluation results are available to students

APK ADMINISTRATORS

For suggestions or concerns related to APK courses or programming, please reach out to any of the following:

- Dr. David Vaillancourt, APK Chair, vcort@ufl.edu
- Dr. Stephen Coombes , APK Graduate Coordinator, scoombes@ufl.edu
- Dr. Anna Gardner, APK Undergraduate Coordinator, akgardner@ufl.edu

Grading

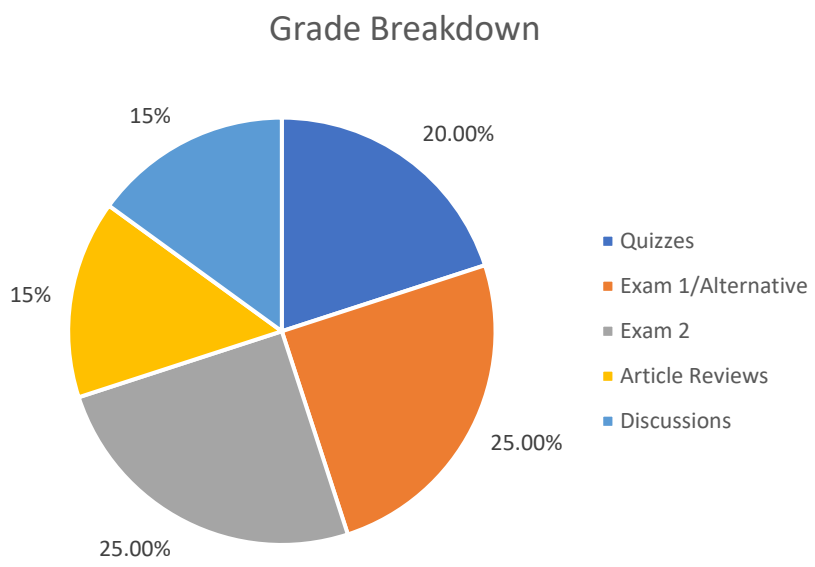
Students will earn their course grade based on completion of coursework as outlined in the Grading Criteria listed below. Percentage calculations are rounded up at ".6 or above" and rounded down at ".5 or below". For more information regarding Grade Point Averages, Grade Values, etc. please visit the University registrar website

GRADING CRITERIA

Letter Grade	Grade Points	Percentage	GPA Impact
A	*4.00*	100-91.5	4.0
A-	*3.67*	91.4-88.5	3.67
B+	*3.33*	88.4-86.5	3.33
B	*3.00*	86.4-79.5	3.0
C+	*2.33*	79.4-76.5	2.33
C	*2.00*	76.4-71.5	2.0
D+	*1.33*	71.4-69.5	1.33
D	*1.00*	69.4-59.5	1.00
E	*0.00*	Below 59.5	0

ASSIGNMENTS

- Quizzes 20%
- Exam 1/Alternative Assignment 25%
- Exam 2 25%
- Article Reviews 15%
- Discussions 15%



Quizzes:

- You have 1 attempt to answer all questions correctly
- The quiz is untimed so please take all the time you need on each attempt.
- The quiz is open book and open note.
- Answers will display for 24 hours once the quiz has closed.

Exam 1:

- Questions will be randomly pulled from the exam banks.
    - I won't know what questions you'll get until after you take the exam.
- You are allowed 2 attempts on the exam
    - This is designed to offset being the first exam you take in the course.
    - You will not be able to view the questions and your answers between attempts.
    - The highest score from the 2 attempts is used in calculating your final grade.
- You will not be able to see correct answers until after the exam window has passed.
    - Exam questions and correct answers will be posted the day after the Exam for 24 hours.
- The exam is not timed, but you can't work on it past the Due Date/Time. Be finished before then.
    - Keep in mind the exam is on Eastern Standard Time for those in different time zones.
- Honorlock will be on during the exam. There is a basic calculator. Notes, scratch paper, and textbook are **NOT** permitted (different than quizzes).

Teach it Back (Exam 1 Alternative Assignment)

- *This is designed for those students who would like an alternative to taking exam 1.*
    - *By teaching the material hopefully, you are able to retain some of the information and I believe that fulfills the same role as exam 1.*
- *You will record yourself teaching the content from each module back to me in 10 videos that are submitted to CANVAS*
- *Each section (10 Powerpoints provided by me) must be recorded in one video.*
- *Grading*
    - *Content-If you skip a section and don't record a video it is an automatic 10% reduction in grade.*
        - *In total there should be 10 videos submitted for this assignment*
        - *You must discuss all material in each presentation. (I would suggest taking a look at my lectures and mimicking them.)*
    - *Style-Make sure you are teaching, not reading.*

Exam 2:

- Questions will be randomly pulled from the exam banks.
    - I won't know what questions you'll get until after you take the exam.
    - 20-25% of questions will come from the exam 1 banks
- You are allowed 1 attempt on the exam.
- You will not be able to see correct answers until after the exam window has passed.
- Exam questions and correct answers will be posted the day after the Exam for 24 hours The exam is not timed, but you can't work on it past the Due Date/Time. Be finished before then.
    - Keep in mind the exam is on Eastern Standard Time for those in different time zones.
- Honorlock will be on during the exam. There is a basic calculator. Notes, scratch paper, and textbook are **NOT** permitted (different than quizzes).

Article Reviews:

- Students are expected to post 3 research article synopses to the Assignment page in CANVAS by the due dates in CANVAS. Each article synopsis requires students to search a relevant database of research journals (i.e. Google Scholar, SportDiscus, PubMed) to find a peer-reviewed research article related to one of the course topics. Students should read the selected articles in their entirety and then post a brief synopsis of the article(s) to CANVAS. Turn-it-in score should not exceed 20%. A citation or a copy of the article should be included. Each Synopsis is graded Pass/Fail.
- The synopsis should be written and should include the following headers:
    - Reason for Selection
    - Research Problem
    - Methods
    - Results/Conclusions
    - Takeaways.
- Students should briefly summarize why they selected the article, what research problem was addressed in the article, how the experiment was conducted, the most important results and explanations for the results provided by the authors of the study, and what information from the article can be used by classmates in a practical sense of exercise physiology.
- Student must gain 4 out of 5 points to pass. (This must include the point for Turn-it-in)

Rubric:

Headers		
1 point	0 points	
All 5 headers were listed	Fewer than 5 headers were listed	

Summaries		
2 point	1 point	0 points
A thoughtful summary was included under each header.	A thoughtful summary was included under 4 out of 5 headers.	A thoughtful summary was included under 3 or fewer headers.

Turn-it-in		
1 point	0 points	

Turn-it-in score was Green or Blue	Turn-it-in score was not green or blue	

Article Citation/Copy		
1 point	0 points	
A copy of the article or citation was included in the assignment	A copy of the article or citation was not included in the assignment	

Discussions:

- This is the online discussion posting board for the course.
- Content will be based on course materials

Rubric:

Length	
1 point	0 points
Post is at least 40 words long	No post

Depth		
1 point	0.5 points	0 points
A thoughtful response to the discussion question is evident in the post. Posts demonstrates depth of knowledge beyond cursory.	Post is made but knowledge is mostly cursory/low level.	No post

Accuracy		
1 point	0.5 points	0 points
The post contains information that is supported by the class learning materials or does not contradict class materials.	The post contains 1-2 pieces of information that is not supported by the class learning materials or contradicts class materials.	No post or more than 2 issues with accuracy of post.

Writing Skill		
1 point	0.5 points	0 points
The post is written with proper grammar and spelling.	Post has 1-2 types of grammar or spelling issues	No post or more than 2 types of grammar or spelling issues

Collegiality	
1 point	0 points
Student replied to at least one of their classmate's posts by the due date	Student did not reply to at least one of their classmate's posts by the due date

Extra Credit: (Optional)

- Each learning module contains an extra credit practice-questions assignment. The assignment involves students creating up to 2 practice questions from the module's learning material. Each new question created is worth 1 bonus point to be added to the next closest exam to the module (either exam 1 or 2).
- I will review questions and may include some of them in the exam question pools for the course.

Weekly Course Schedule

Module Start	Topics	Assignments	Module End & Assignment Due Date*
Aug 21st	Syllabus/Introduction	Introduction Discussion Syllabus Quiz	Sept 7th
Aug 21st	Basic Exercise Physiology Review	Physiology Overview Quiz	Sept 7th
Sept 8th	Hypothermic and Hyperthermic Physiology	Hyperthermic Quiz Hyperthermic Discussion Hypothermic Quiz Hypothermic Discussion Article Review 1 Due	Sept 28th
Sept 29th	Psychological Stress Physiology	Psychology Extremes Quiz Psychology Extreme Discussion	Oct 5th
Oct 6th	**Exam 1**		Oct 12th
Oct 13th	Hyperbaric and Hypobaric Physiology	Hyperbaric Quiz Hyperbaric Discussion Hypobaric Quiz Hypobaric Discussion Article Review 2 Due	Nov 2nd
Nov 3rd	Microgravity Physiology	Microgravity Quiz Microgravity Discussion	Nov 16th
Nov 17th	Current and Future Technology	Technology Quiz Technology Discussion Article Review 3 Due	Nov 23rd
Nov 24th	**Exam 2**		Dec 3rd

***All Assignments are due by 11:59pm EST of the date listed.**

Textbook Chapters by Module:

1. Basic Exercise Physiology: None
2. Hypothermic/Hyperthermic: Advanced Environmental Physiology (Cheung) Chapters 1-3 and 5-6
3. Psychological Stress: Human Physiology in Extreme Environments (Gunga) Chapter 8
4. Hyperbaric/Hypobaric: Advanced Environmental Physiology (Cheung) Chapters 7-11
5. Microgravity: Space Physiology (Buckey) Chapter 1, 4, and 7
6. Current and Future Technology: Advanced Environmental Physiology (Cheung) Chapters 14-15