

**USC** Dornsife  
College of  
Letters, Arts and  
Sciences

**Course ID and Title:** HBIO 420L – Applied Human Physiology

**Units:** 4 units

**Term – Day – Time:** Spring 2023 – MWF 10:00 a.m. – 10:50 a.m.

**Location:** THH 102

**Instructor:** Kurt E. Kwast, Ph.D.

**Office Hours:** Wednesday 12:10 p.m. – 1:40 p.m.\*, Friday 12:00 p.m. – 1:30 p.m.\*, and by appointment (\*subject to change depending on my daughters' school schedules)

**Location:** AHF 251

Contact Info: [kwast@usc.edu](mailto:kwast@usc.edu)

**Lab:** Monday 2:00 – 4:50 p.m. (38492R)

Monday 5:00 – 7:50 p.m. (38495R)

Tuesday 5:00 – 7:50 p.m. (38489R)

Thursday 11:00 a.m. – 1:50 p.m. (38491R)

Thursday 2:00 – 4:50 p.m. (38493R)

Thursday 5:00 – 7:50 p.m. (38495R)

**Location:** PED B12

**Peer Tutor:** TBA

**Review Sessions:** TBA

**Contact Info:** [TBA@usc.edu](mailto:TBA@usc.edu)

**Office:** TBA

**Lab Instructors:**

**Alexis Camacho**

Contact Info: [ascamach@usc.edu](mailto:ascamach@usc.edu)

**Joshua Carlos**

Contact Info: [jcarlos6@usc.edu](mailto:jcarlos6@usc.edu)

**Gudrun “Bara” Floyd**

Contact Info: [gbfloyd@usc.edu](mailto:gbfloyd@usc.edu)

**Office Hours:** TBA

**Location:** TBA

**Lab Director:** Anh-Khoi Nguyen, Ph.D.

**Office Hours:** by appointment

**Contact Info:** [agnguyen@usc.edu](mailto:agnguyen@usc.edu)

**Office:** PED 109

**IT Help:** Dornsife Technology Services

**Hours of Service:** TBA

**Contact Info:** <https://dtssupport.usc.edu>, 213-740-2775

## Course Description

Exploration of the function of cells, tissues, organs, and organ systems with focus on the integration within and between the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, immune, renal, digestive, and reproduction systems, and its application in human health and disease. *Course Prerequisite: BISC 220L; Suggested Course Prerequisite: HBIO 301*

## Learning Objectives

The primary learning objective is for students to be able to identify the structural components of the human body and to ensure that students can explain and describe how the human body works.

- Students should be able to recognize, explain, and provide examples of homeostasis and the mechanism involved, including the roles of negative and positive feedback.
- Students should be able to identify structural components and explain the functional attributes of each of the body's organ systems as well as elucidate and demonstrate the interrelationships within and between them.
- Students should be able to model, interpret, explain, and predict the integrated responses of the organ systems to physiological and pathological stressors.
- Students should be able to describe and explain the pathophysiology of common diseases as well as use critical thinking skills to make real-world connections between life-style choices and homeostatic imbalances that comprise our current, global health crises.

## Relevant Human Biology BS & BA Degree Learning Objectives Addressed in Part by This Course

- Develop a deeper comprehension of the central and cross-disciplinary concepts of human biology, which include bioenergetics, the interrelationship of human form and function, physiological homeostasis, and biomechanics.
- Develop proficiency in modern methodologies pertinent to research in biological and medical sciences.
- Think critically, analyze, synthesize, and use information to solve real-world problems.
- Develop sufficient depth of knowledge and skill for graduate study in the health professions or other biology-related disciplines or entry-level employment in a wide variety of health-related fields.

**Prerequisite(s):** HBIO 301 and either BISC 220 or BISC 221

**Co-Requisite(s):** None

**Concurrent Enrollment:** None

## Technological Proficiency and Hardware/Software Required

Although there are no specific technology/software requirements *per se*, you will need an internet-enabled device with browser capabilities, such as a tablet, laptop or desktop computer, to access Blackboard, which will be the gateway for most assignments as well as the repository for lecture slides, videos, and other course materials. Should we need to go online, lectures will be delivered via Zoom and exams will require [Respondus Lockdown Browser](#). Support for these resources can be found at the [ITS Customer Support Center](#).

## USC Technology and Loaner Program

If students need resources to successfully participate in this class, such as a laptop or internet hotspot, you may be eligible for the university's loaner program. Please see the following links for additional relevant information: [USC Computing Center Laptop Loaner Program](#); USC Technology Support Links: [Zoom information for students](#), [Blackboard help for students](#), [Software available to USC Campus](#).

## Required Readings

***Human Physiology: An Integrated Approach***. 8<sup>th</sup> ed. Silverthorn. Pearson Publishing, New York, NY, 2016, with Modified Mastering A & P/ET VP A/C, 8/E, ISBN 9780134269221

Hardcopies of the text can be obtained from the campus bookstore and various online retailers including Amazon. There are many purchasing options including an eText, loose leaf, and hardback version of the text but you must purchase Modified Mastering as this is required for access to the Pearson website where all homework and pre-lecture assignments will be completed. It is not necessary for you to purchase Learning Catalytics as it will not be used this semester.

***Laboratory Manual for Applied Systems Physiology*** by Henige, K., and M. Matveyenko.

The spiral bound hard copy is available for purchase at the campus bookstore and USC Custom Publishing, and an electronic version is available from USC Custom Publishing.

## Description and Assessment of Assignments

***Written Exams*** will be administered in person on specific days during the class period (see Course Schedule below). Exams will be used to assess all of the learning objectives. Exams may include multiple choice, multiple answer, true or false, fill-in-the-blank, short answer, or essay questions. A request to take a make-up exam must be accompanied by evidence of a university-sanctioned excused absence (*e.g.*, a letter from a doctor, athletic release, etc.) and must be made before the date of the scheduled exam. Make-up exams may be given in a different format from that of the scheduled exam (*e.g.*, essay). Students who live in a different time zone in which synchronous exam completion would be extremely inconvenient should contact me during the first week of class in order to potentially make other arrangements for taking exams.

***In-Class Work*** will be unscheduled and used to assess all learning objectives. Work may include small group assignments, polls, a summary of lecture points, open-note quizzes, problem solving in groups, a submitted question of a “muddy point,” or other individual assignments to be submitted or reported on by the end of class. When working in groups, all members will receive the same score for the work product. Students who miss an assignment as a result of either arriving late or leaving early will not have the opportunity to make up the work. However, the lowest three in-class assignments will be dropped to allow for occasional absences.

***Pre-Lecture and Homework Assignments*** will be completed at the Pearson website, with a link provided in Blackboard. Typically, these assignments will be posted on Fridays at 5:00 p.m., with homework assignments typically due Wednesday by 9:00 p.m. and pre-lecture assignments due at the beginning of the class period in which the material will be covered (the day of the week will vary depending on the lecture schedule). Please check the Pearson calendar every Friday evening to see when specific assignments are due.

## Participation

Students are expected to attend lectures in-person and to participate in in-class activities given they cannot be made up unless a student has been excused from such an assignment due to a university-sanctioned excuse (*e.g.*, illness, religious holiday, athletic event, etc.).

## Grading Breakdown

| Assignment                    | Points | % of Grade |
|-------------------------------|--------|------------|
| In-Class Learning Assignments | 50     | 5          |

|                         |             |            |
|-------------------------|-------------|------------|
| Pre-lecture Assignments | 50          | 5          |
| Homework Assignments    | 100         | 10         |
| Midterm Exam 1          | 120         | 12         |
| Midterm Exam 2          | 120         | 12         |
| Midterm Exam 3          | 120         | 12         |
| Final Exam              | 190         | 19         |
| Laboratory              | 250         | 25         |
| <b>Total</b>            | <b>1000</b> | <b>100</b> |

## Grading Scale

| Letter Grade | Point Ranges | Grade Point Value |
|--------------|--------------|-------------------|
| A            | 930 - 1000   | 4.0               |
| A-           | 900 - 929    | 3.67              |
| B+           | 870 - 899    | 3.33              |
| B            | 830 - 869    | 3.0               |
| B-           | 800 - 829    | 2.67              |
| C+           | 770 - 799    | 2.33              |
| C            | 730 - 769    | 2.0               |
| C-           | 700 - 729    | 1.67              |
| D+           | 670 - 699    | 1.33              |
| D            | 630 - 669    | 1.0               |
| D-           | 600 - 629    | 0.67              |
| F            | <600         | 0.0               |

Individual assignments, exams and labs will be scored but not assigned a letter grade. Only the final point tally will be assigned a letter grade.

## Late Work

All in-class assignments will be due by the end of class and cannot be made up if missed. Similarly, all pre-lecture and homework assignments will have published due dates and will not be accepted late. However, the lowest three assignments of each will be dropped to allow for occasional in-class absences and missed pre-lecture or homework assignment deadlines.

## Communication Policies

Students are *strongly* encouraged to contact the instructor in regard to all matters involving course content or policy during Zoom office hours. Should you have a question about specific course content and cannot attend office hours, students are encouraged to submit their question to the course blog. Should you need to communicate with the instructor outside of class or office hours about a question other than course content, please email the instructor from your USC email account *making sure to include in the subject line the course number and your full name* (expect significant delays or no response if this information is omitted). Simple questions will be answered by email but, for more complex discussions, students may be instructed to visit office hours. Best attempts will be made to answer all

emails within 48 hours, 72 hours over a weekend and the work day following a holiday. Note that the instructor may not respond to non-emergency emails 24 hours preceding an exam and may not respond to emails sent from non-USC accounts.

To promote independence and critical thinking, students are encouraged to work through the following process for obtaining answers to course-related questions before contacting the instructor. First, consult the course syllabus. If you cannot find the answer you need, next consult a classmate. If you still cannot find a satisfactory answer, email the instructor using your USC email *making sure to include the course number and your full name in the subject line* (expect significant delays or no response if this information is omitted). In your email, please indicate the steps you have gone through to seek the answer for your question. Use your USC email account for all correspondence with the instructor.

### **Technology Policies**

During synchronous Zoom sessions, it is expected that students will use their internet-enable device(s) to participate in activities guided by the instructor alone. Such activities include looking up terms, doing research, and completing in-class work. Please make sure all electronic devices are silenced so as not to disturb classmates or the instructor during synchronous sessions. Use of electronic devices for other purposes during class is strongly discouraged and you may be asked to put a device away should your instructor deem it to be disruptive to class. If you require an internet-enabled device, please see the “Technological Proficiency and Hardware/Software Required” section above.

### **Diversity, Equity, and Inclusion Statement**

I and your laboratory instructors are committed to the creation and maintenance of inclusive learning spaces in which you will be treated with respect and dignity, and where all individuals are provided equitable opportunity to participate, contribute, and succeed. In HBIO 301, all students are welcome regardless of race/ethnicity, gender identities/expressions, sexual orientation, socio-economic status, age, disabilities, religion, regional background, Veteran status, citizenship status, nationality and other diverse identities that each of you and the faculty bring to class. I view the diversity that all of us bring to this class as a coveted resource that cultivates strength and benefit.

Your success at USC and beyond is enhanced by the innovation and creativity of thought that inclusive classrooms facilitate. However, the success of an inclusive classroom relies on you, your peers, and our participation, support, and understanding. I encourage you to speak up and share your views but to also understand that you are doing so in a learning environment in which all of us are expected to engage respectfully with regard to the dignity of others.

It is my intent that all students be well served by this course and that your learning needs be addressed both in and out of class. If any of your needs are not being met, please talk directly to me or to the appropriate resource provider listed at the end of this syllabus.

### **Zoom Etiquette (if applicable)**

In order to simulate an in-class-room experience during synchronous Zoom sessions, one that promotes positive interactions and feedback to the instructor and fellow students, students are strongly encouraged to attend the sessions dressed in classroom attire and to turn on their webcams if they are located in a learning-appropriate environment. So as to circumvent Zoom bombing, synchronous Zoom sessions will be password protected and students will only be allowed to enter through the USC’s Blackboard site when displaying their full name as it appears in the class roster

(aliases are not permitted). Microphones should be muted unless actively asking questions or involved in discussion. In-meeting chat will likely be enabled but actively monitored for disruptive or inappropriate posts and recorded for further review. Disruptive or inappropriate behavior will not be tolerated and anyone engaging in such behavior shall be removed from the session. Should bandwidth be an issue, try joining with the video from your webcam and use your cellphone for the audio. If you have any questions or concerns about complying with these policies, please email the instructor.

### Synchronous Session Recordings

If we are instructed to do so by the administration, all synchronous sessions (save for office hours) will be recorded and posted on Blackboard, typically within a few hours of the session.

### Sharing of Course Materials Outside of the Learning Environment is Strictly Prohibited

USC has a strict policy (SCampus Section 11.12[B]) that prohibits sharing of *any* synchronous and asynchronous course content outside of the learning environment. Any student who violates this policy will be prosecuted to the maximum extent allowable by the USC Student Conduct Code, including failure of the course and suspension from the University.

*Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).*

### Tentative Course Schedule

| Date    | Lecture Topic                                       | Silverthorn (8 <sup>th</sup> ed.) |
|---------|---|-----------------------------------|
| Jan. 9  | Introduction / Homeostasis                          | Ch. 1                             |
| Jan. 11 | Bioenergetics & Membrane Physiology                 | Ch. 1 - 4                         |
| Jan. 13 | Bioenergetics & Cellular Metabolism                 | Ch. 1 - 5                         |
| Jan. 16 | <b>Martin Luther King Junior Holiday</b>            |                                   |
| Jan. 18 | Membrane Physiology                                 | Ch. 5                             |
| Jan. 20 | Endocrinology I: Hypothalamus and Pituitary         | Ch. 7                             |
| Jan. 23 | Endocrinology II: Hormones, Homeostasis & Pathology | Ch. 7                             |
| Jan. 25 | Endocrinology II: Hypothalamus and Pituitary        | Ch. 7                             |
| Jan. 27 | Neurophysiology: Neurons                            | Ch. 8                             |
| Jan. 30 | Neurophysiology: Neurons                            | Ch. 8                             |
| Feb. 1  | Neurophysiology: Signal Transduction                | Ch. 8                             |
| Feb. 3  | Neurosensory Physiology                             | Ch. 10                            |
| Feb. 6  | Muscle Physiology                                   | Ch. 12                            |
| Feb. 7  | Muscle Physiology                                   | Ch. 12                            |
| Feb. 10 | <b>MIDTERM EXAM 1</b>                               |                                   |
| Feb. 13 | Muscle Bioenergetics and Force                      | Ch. 12                            |

|             |  |             |
|-------------|--|-------------|
| Feb. 15     | Cardiovascular Physiology                                      | Ch. 14      |
| Feb. 17     | Cardiovascular Physiology                                      | Ch. 14      |
| Feb. 20     | <b>Presidents' Day Holiday</b>                                 |             |
| Feb. 22     | Cardio- and Vascular-Dynamics                                  | Ch. 15      |
| Feb. 24     | Regulation of Ventilation & Circulation                        | Ch. 16-18   |
| Feb. 27     | Regulation of Ventilation & Circulation                        | Ch. 16-18   |
| Mar. 1      | Renal Physiology   | Ch. 19      |
| Mar. 3      | Renal Physiology   | Ch. 19      |
| Mar. 6      | Fluid & Electrolyte Balance                                    | Ch. 20      |
| Mar. 8      | Fluid & Electrolyte Balance / Digestive Physiology             | Ch. 20 & 21 |
| Mar. 10     | <b>MIDTERM II</b>  |             |
| Mar. 13 -17 | <b>Spring Break</b>  |             |
| Mar. 20     | Digestive Physiology   | Ch. 21      |
| Mar. 22     | Digestive Physiology   | Ch. 21      |
| Mar. 24     | Homeostatic Control of Digestion and Metabolism                | Ch. 22      |
| Mar. 27     | Metabolic Regulation and Control of Body Temperature           | Ch. 22      |
| Mar. 29     | Advanced Endocrinology and Metabolic Control                   | Ch. 23      |
| Mar. 31     | Advanced Endocrinology   | Ch. 23      |
| Apr. 3      | Immunology   | Ch. 24      |
| Apr. 5      | Immunology   | Ch. 24      |
| Apr. 7      | Immunology / Physiology of Reproduction                        | Ch. 24 & 26 |
| Apr. 10     | Physiology of Reproduction                                     | Ch. 26      |
| Apr. 12     | Exercise Physiology  |             |
| Apr. 14     | Exercise Physiology  |             |
| Apr. 17     | <b>MIDTERM III</b>   |             |
| Apr. 19     | Physiology of Altitude: Hypobaric                              |             |
| Apr. 21     | Physiology of Altitude: Hypobaric & Exercise                   |             |
| Apr. 24     | Diving Physiology  |             |
| Apr. 26     | Diving Physiology  |             |
| Apr. 28     | Selected Topics  |             |
| May 8       | <b>Semi-Comprehensive FINAL EXAMINATION 8:00 am – 10:00 am</b> |             |

## Statement on Academic Conduct and Support Systems

### Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity’s website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

### **Students and Disability Accommodations:**

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

### **Support Systems:**

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.



[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.