



Critical Oxygen Academy
CO 101: Exercise Physiology for Athletes and Coaches
Summer 2024

Room: Zoom Link – sent out before first class
Scheduled: 3:00-5:00PM Wednesday July 3rd – August 7th

Instructor: Phil Batterson, Ph.D.
Contact: It's best to contact me on the google classroom
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COURSE DESCRIPTION

The human body undergoes **MASSIVE** changes in response to acute and chronic exercise training. Understanding **HOW** the body responds gives us the ability to understand **WHY** exercise training is so important and **WHAT** we can do to maximize adaptations.

LEARNING RESOURCES

I will be providing citations within the course (during class) but if you want to read a book (it's completely optional), this is the one I recommend for most. Stick to the earlier editions they are MUCH more affordable.

Powers, S.K., Howley, E.T., Quindry, J. (2021) Exercise Physiology: Theory and application to fitness and performance. 11th edition. New York, NY: McGraw Hill. (Optional)

- The 9th or 10th editions of the same text are equally adequate

LEARNING ENVIRONMENT

LIVE ZOOM CLASSES - This course will be held LIVE on ZOOM every Wednesday for 6 weeks. This will give you the opportunity to ask me questions as we go and get a more in-depth experience. ****There won't be any required reading (you should get all the information necessary for this course within the lectures) BUT I will link to open access articles where more information might be nice.**

Google Classroom – The course will be hosted on Google Classroom (link sent out later). Each week's lecture will be recorded and posted on the google classroom site so you can review as needed.

The google classroom will also act as a forum to ask questions and turn in assignments (all of them are optional but will greatly help your ability to talk about these topics). This will also be where I make announcement and communicate with the Class.

IF YOU CAN'T ATTEND the live lectures, that is not a big deal, you will still be able to watch the lectures and complete the assignments at your own pace!

STUDENT LEARNING OUTCOMES

1. Describe why there is an acute stress response to exercise (i.e. why is exercise a large stress) and what our body does in response.
2. Describe the bioenergetic response to exercise (i.e. how is our muscle driving the stress response) and what happens at the muscle in response to acute and chronic exercise.
3. Describe the pulmonary and cardiovascular systems response to acute exercise and how each of these systems adapt to chronic training.
4. Describe the role of metabolic acidosis on fatigue during exercise activity and performance.
5. Describe how the body responds acutely to the demands of different environments (heat and altitude) and how the body adapts to these stresses over time.

COURSE CONTENT

Day 1 – Why Exercise is a Stress

Lesson 1 - the acute stress response (what happens to our body when we start exercise).

Assignment 1

Lesson 2 - how does our body protect from these deviations? And what happens to the stress response if we train? Stress hormone release, increased heart rate and pulmonary function!

Assignment 2

Day 2 - Acute Stress of Exercise on the Muscle

Lesson 1 - what happens to the muscle to drive systemic changes?

Assignment 3

Lesson 2 - how does the muscle reestablish homeostasis? Energetic systems

Assignment 4

Day 3 - Transport and Delivery of Oxygen and Substrate (Pulmonary and Cardiovascular Physiology)

Lesson 1 - how does the pulmonary system respond to acute exercise and why?

Assignment 5

Lesson 2 - how does the cardiovascular system respond to stress?

Assignment 6

Day 4 - The Effects of Chronic Stress – Muscle and Bioenergetic Changes

Lesson 1 - how does the overall stress response change?

Assignment 7

Lesson 2 - how does the muscle change? Mitochondrial adaptations that facilitate substrate changes! And better buffering!

Assignment 8

Day 5 - The Effects of Chronic Stress – Pulmonary and Cardiovascular Changes

Lesson 1 - how does the CV system adapt to stress?

Assignment 9

Lesson 2 - does the pulmonary system adapt to stress?

Assignment 10

Day 6 - Special Environments for Acute and Chronic Stress

Lesson 1 - Heat. Acute, chronic, and how to train!

Assignment 11

Lesson 2 - Altitude. Acute, chronic and how to train!

Assignment 12

EXPECTATIONS FOR STUDENT CONDUCT

Please be courteous to fellow students within the live zoom and on the forum. I encourage people attending the class to try and answer questions where they can (I will step in with corrections if necessary). I want this to be a fun learning environment full of like-minded people so please conduct yourself accordingly

POSTING OF COURSE DOCUMENTS

Please do not post lecture slides, assignments or any other course material anywhere, this is property of Critical Oxygen LLC and would violate copyright laws if you were to do so. I do encourage you to make reels or other social media posts about what you have learned in the class though, just make sure it's in your own words!