Instructor
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office hours: by appointment

Course Summary
With the Michelle Obama's "Let's Move" initiative and the NFL's "Play 60" program, there is increasing awareness in this country of the importance of physical activity for overall health. In this course we dive deeper into the physiology and anatomy behind exercise science looking specifically at how the musculoskeletal, cardiovascular, respiratory, and nervous systems respond to physical activity. Additionally we consider how the body reacts differently depending on activity type, environmental condition, and participant age.

Learning Objectives
Students who successfully complete this course will be able to:

• Explain how different systems of the body respond to the acute stress of a single bout of physical activity
• Explain how different systems of the body adapt to the chronic stress of repeated bouts of physical activity
• Explain how environmental conditions, such as temperature and altitude, influence physiology during physical activity.
• Explain how age, sex, and disease influence physiology during physical activity
• Explain the health benefits of physical activity
• Apply the knowledge about sports physiology to understand the effectiveness of particular training techniques, nutritional regimes, and ergogenic aids to sport performance.
• Explain the complex relationship between genotypic and environmental influences on athletic performance.

Prerequisites
Topics will be discussed with the assumption that you have some knowledge of introductory biology and human physiology. It is strongly recommended that you complete BIOS E-1a and BIOS E-1b or similar introductory biology courses prior to taking this class. Further, it is recommended that you complete BIOS E-65C or BIOS E-65D or a similar Anatomy and Physiology course prior to taking this course. Students who do not have these prerequisites are encouraged to discuss their academic background with Dr. Miara prior to registering.
**Zoom Rooms & online learning**

Research tells us that students learn best when actively engaged in the learning process. While I realize lectures are offered at a time and place that may prevent many of you from attending in person, I hope you will join me virtually whenever possible. In order to facilitate this Harvard Extension will be piloting use of *Zoom Rooms*. This software will allow you to participate live during class wherever you are. You will see me in the classroom and I will see a screen of all of your smiling faces - *Brady Bunch* Style. This will allow me to integrate active learning activities into my classes making them more engaging and enhancing your learning. If you are not able to participate in person I encourage you to join us through *Zoom Rooms* whenever possible. If neither is possible for you, recordings of the lectures will be available.

**Graduate Students**

This course is offered with a graduate student option. Graduate students will be expected to complete all same tests and assignments as undergraduate students. They will also be expected to write a 10 page term paper and give a 20 minute presentation outlining their term paper topic to the class. There are many different ways the presentation could be given and recorded depending on the schedule and location of each graduate student. The details of this will be determined on a case by case basis.

**Required Texts**


**Academic Honesty**

You are responsible for understanding Harvard Extension School policies on academic integrity ([www.extension.harvard.edu/resources-policies/student-conduct/academic-integrity](http://www.extension.harvard.edu/resources-policies/student-conduct/academic-integrity)) and how to use sources responsibly. Not knowing the rules, misunderstanding the rules, running out of time, submitting "the wrong draft", or being overwhelmed with multiple demands are not acceptable excuses. There are no excuses for failure to uphold academic integrity. To support your learning about academic citation rules, please visit the Harvard Extension School Tips to Avoid Plagiarism ([www.extension.harvard.edu/resources-policies/resources/tips-avoid-plagiarism](http://www.extension.harvard.edu/resources-policies/resources/tips-avoid-plagiarism)), where you'll find links to the Harvard Guide to Using Sources and two, free, online 15-minute tutorials to test your knowledge of academic citation policy. The tutorials are anonymous open-learning tools.
Disabilities
The Extension School is committed to providing an accessible academic community. The Disability Services Office offers a variety of accommodations and services to students with documented disabilities. Please visit www.extension.harvard.edu/resources-policies/resources/disability-services-accessibility for more information.

If you are a student with a disability that has been documented by the disabilities office and if you wish to request a reasonable accommodation for this class, please see me immediately. Please keep in mind that reasonable accommodations are not provided retroactively.

Course Policies
1. Students should attend or view all lectures.
2. Students are expected to be aware of all announcements made in class and all material on the course website.
3. Weekly Responses are due at 11:59pm EST on Mondays according to the schedule below. These are not accepted late.
4. Assignments are due at 11:59pm EST on the dates indicated below. Late assignments will lose 10% for each day past the due date.
5. Students should regularly check the course website for handouts, course information and any changes to the syllabus.

Evaluation

Undergraduate Students:
40% - Assignments
10% - Weekly Responses (submitted using online form, due each Monday 11:59pm EST starting Jan 30 and ending May 1)
25% - Take home Test 1
25% - Take home Test 2

Graduate Students:
30% - Assignments
10% - Weekly Responses (submitted using online form, due each Monday 11:59pm EST starting Jan 30 and ending May 1)
15% - Take home Test 1
15% - Take home Test 2
15% - Term Paper, see term paper handout on course website
15% - Presentation
This syllabus is subject to change. Please check back frequently for updates.
Last updated 1/06/17

<table>
<thead>
<tr>
<th>Lecture Date</th>
<th>Lecture Topic</th>
<th>Reading (from Kenney et al.)</th>
<th>Assignments Due (All Students)</th>
<th>Assignments Due (Grad Students Only)</th>
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<tbody>
<tr>
<td>January 25</td>
<td>Introduction &amp; Muscle</td>
<td>Introduction &amp; Ch 1</td>
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<tr>
<td>February 1</td>
<td>Metabolism &amp; Neuronal Control</td>
<td>Ch 2 &amp; 3</td>
<td>Weekly Response*</td>
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<tr>
<td>February 8</td>
<td>Hormonal Control &amp; Fatigue</td>
<td>Ch 4 &amp; 5</td>
<td>Weekly Response*</td>
<td>Assignment 1 Due</td>
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<tr>
<td>February 15</td>
<td>Cardiovascular System</td>
<td>Ch 6</td>
<td>Weekly Response*</td>
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<td>February 17, 9am Note: Friday Lecture</td>
<td>Respiratory System</td>
<td>Ch 7</td>
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<tr>
<td>March 1</td>
<td>Response to Acute Exercise &amp; Training I</td>
<td>Ch 8 &amp; 9</td>
<td>Weekly Response*</td>
<td>Assignment 2 Due</td>
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<tr>
<td>March 8</td>
<td>Training II</td>
<td>Ch 10-11</td>
<td>Weekly Response*</td>
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<td>March 15</td>
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<td>NO CLASS - Spring Break</td>
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<td>March 22</td>
<td>Take Home Test 1</td>
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<tr>
<td>March 29</td>
<td>Temperature and Altitude</td>
<td>Ch 12 &amp; 13</td>
<td>Weekly Response*</td>
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<td>April 5</td>
<td>Sport Training &amp; Ergogenic Aids</td>
<td>Ch 14 &amp; 16</td>
<td>Weekly Response*</td>
<td>Assignment 3 Due</td>
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<td>April 12</td>
<td>Nutrition</td>
<td>Ch 15</td>
<td>Weekly Response*</td>
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<td>April 19</td>
<td>Age Differences</td>
<td>Ch 17 &amp; 18</td>
<td>Weekly Response*</td>
<td>Assignment 4 Due**</td>
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<td>April 26</td>
<td>Sex Differences</td>
<td>Ch 19</td>
<td>Weekly Response*</td>
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<td>May 3</td>
<td>Physical Activity and Health</td>
<td>Ch 20-22</td>
<td>Weekly Response*</td>
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<tr>
<td>May 10</td>
<td>Take Home Test 2</td>
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<td>Assignment 5 Due***</td>
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* Weekly Responses due Monday 11:59pm each week starting Jan 30 and ending May 1
** Assignment 4 is a semester long project in which each student must record and interpret changes in their own physiology as a result of chronic bouts of physical activity
*** Assignment 5 relates specifically to the reading of “The Sports Gene” and may be submitted at any point throughout the semester.