KIN 235: Exercise Physiology

Winter Session Term 1, 2021

UBC’s Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

Course Structure: Lectures Mon/Wed/Fri: 10:00 AM to 11:00 AM in HENN-201. Labs at assigned times OSB2-125G3, only on weeks indicated below

Your Instructor: Dr. Cameron Mitchell (cameron.mitchell@ubc.ca)

Your TAs: Matthew Fliss (matthew.fliss@ubc.ca) & Owen Harris (owen.harris@ubc.ca)

Previous course code: Kin 275

Preferred Contact method: Email if question relates to only to you. Please use the discussion forums for questions about course material. Dr. Mitchell will answer focused questions directly in the discussion forms but will answer broader or more open ended in class or during office hours.

Response time: I aim to respond to emails/discussion posts within 24 hours but will not respond on evenings or weekends. Response times may be slower in the days immediately before quizzes and final exam due to last minute questions so please ask questions early!

Office hours: via Zoom by appointment

Course Description

The course will introduce how the muscular, ventilatory and cardiovascular systems respond to acute and chronic exercise.

Prerequisite(s): Bachelor of Kinesiology, second year standing
Corequisite(s): None

Learning Outcomes

The goal of the course will be to link together different learning modules so that you gain an understand of how the human body respond to acute exercise and how we adapt to training. Specific objectives include:
School of Kinesiology

- Understand the three energy systems, their use and limitations
- Describe the process by which chemical energy is transferred from food to mechanical work
- Explain how acute exercise alters gas exchange and ventilation
- Describe cardiovascular changes which occur with increasing exercise intensity
- Explain the factors which determine muscle strength
- Become familiar with basic exercise physiology laboratory equipment
- Learn to analyze laboratory data
- Understand the physiological mechanisms which underpin the adaptations to aerobic and resistance exercise

At the end of this course, you should be able to provide answer to some overarching questions in exercise physiology:

- What physiological mechanisms allow us to transition from rest to maximal exercise?
- What explains differences in exercise performance between individuals?
- Why does training increase our exercise performance?
- Why does exercise performance decrease with increasing exercise duration; Why do we get tired?

Learning Materials


Assessment

<table>
<thead>
<tr>
<th>Assignment</th>
<th>% of Course, Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab assignments</td>
<td>Labs 1-3:</td>
</tr>
<tr>
<td></td>
<td>5% X 3 = 15%</td>
</tr>
<tr>
<td>4 Module quizzes</td>
<td>10% X 3 = 30%</td>
</tr>
<tr>
<td>(Modules 2-5)</td>
<td>(lowest mark dropped)</td>
</tr>
<tr>
<td>Midterm</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
Big questions assignment | 5%
---|---
Final exam | 37.5%

## Quizzes

Quizzes will take place at the end of modules 2-5. Each quiz will be worth 10% of your final grade and will contain 10-15 questions multiple choice questions. Your lowest quiz mark will not be included in your final mark. Quizzes will take place in scheduled class time, Wednesdays at 10am, you will have 25 min to complete each quiz. There will be a non-graded practice quiz for module 1 on Canvas which you can complete whenever you would like. The material for module 6 will be included on the final exam. If you are unable to attend one quiz for any reason (legitimate or not), the above policy will be applied and the zero mark will be dropped, in this case no additional low quiz marks will be dropped. If you miss more than one quiz for legitimate reasons please follow the Kinesiology in-term academic concession policy: https://kin.educ.ubc.ca/undergraduate/bkin/academic-concession/.

## Midterm

The Midterm will be written at the same time as quiz number 3 and will consist of short answer and long answer questions which link modules 1-4. The total time allocated for the Midterm/quiz 3 will be 50 min. If you are unable to attend the midterm for a legitimate reason please follow the Kinesiology in-term academic concession policy: https://kin.educ.ubc.ca/undergraduate/bkin/academic-concession/ . If your absence is deemed legitimate the weight from the midterm will be added to the final exam.

## Big questions assignment

During the second week of the term (week of September 12th) you will attend your assigned laboratory time and choose a group of 5-6 students who you will work with for the remainder this semester and labs 1-3. These questions describe real world exercise situations that require the interaction of multiple body systems. Each question requires you to understand the demands of a specific situation, the physiological mechanisms involved, why individuals perform differently, and how training might alter task performance. There is no single right answer to any of these questions, your goal throughout the semester will be to improve your answers to these
questions by integrating and applying course material. Hopefully you will find your understanding of the situations improves over the course of the semester.

Lab assignments

There will be three group lab assignments for the course, please see the schedule for the weeks where labs will occur. Please note that data collection for lab #3 will be spread across 2 weeks. Groups of students will gain experience in conducting common exercise physiology tests, analyzing data and interpreting results. Student volunteers will act as subjects for the tests.

Course Schedule

<table>
<thead>
<tr>
<th>Module</th>
<th>Notable Dates</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODULE 1: Introduction and energy transfer</td>
<td>• Sept 8, first day of class!</td>
<td>Ch 5</td>
</tr>
<tr>
<td><em>September 8-10</em></td>
<td>• Week of Sept 12, Pre assessment tutorials</td>
<td></td>
</tr>
<tr>
<td>MODULE 2: Metabolism</td>
<td>• Sept 29, quiz #1</td>
<td>Ch 6,7,8</td>
</tr>
<tr>
<td><em>September 13-24</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MODULE 3: Ventilation</td>
<td>• Week of Oct 4, lab #1</td>
<td>Ch 13, 14</td>
</tr>
<tr>
<td><em>September 27-October 8</em></td>
<td>• Oct 13, Quiz #2</td>
<td></td>
</tr>
</tbody>
</table>
| MODULE 4: Cardiovascular regulation | • Oct 17, lab #1 due  
• Week of Oct 18, lab #2  
• Oct 27, quiz #3/ mid-term | Ch 16, 17 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>October 12- 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| MODULE 5: Muscle Function | • Week of Nov 1, lab #3a  
• Nov 7, Lab #2 due  
• Nov 10-12, fall reading week  
• Nov 17, quiz #4 | Ch 18, 19 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>October 25- November 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| MODULE 6: Exercise training | • Week of Nov 15, lab #3b  
• Nov 17, quiz # 4  
• Nov 28, lab #3 due | Morton, Robert W., Lauren Colenso-Semple, and Stuart M. Phillips.  
Ch 21 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>November 14- December 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: topics and dates are subject to change as needed.

**University Policies**

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including
those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available from the UBC Senate Website.

Course Policies

Please make sure you are familiar with the academic policies and procedures.

Academic Integrity

Students are expected to follow UBC policies for academic integrity and academic misconduct, which includes practices around plagiarism, referencing and citation, and copyright. For more see, UBC's Learning Commons Academic Integrity resources.

Accessibility

If you have any challenges accessing materials that will impact your success in this course, UBC’s Centre for Accessibility can support your needs by providing appropriate accommodations to support you.

- Web: UBC’s Centre for Accessibility website
- Email: accessibility@ubc.ca

Learning Analytics

Some of the learning technologies used for this course collect data to support the improvement of teaching and learning. This includes the collection of data related to overall class progress to provide personalized feedback, engagement in discussion forums to support the fostering of community within the course, and how resources are being accessed to support improvements to the course design. To learn more about learning analytics at the Faculty of Education and at UBC, see the What is Learning Analytics? page.

COVID-19 Safety:

If you are sick, it is important that you stay home. Complete a self-assessment for COVID-19 symptoms here: https://bc.thrive.health/covid19/en. In this class, the marking scheme is intended to provide flexibility so that you can prioritize your health and still succeed.

You are required to wear a non-medical mask during our class meetings, for your own protection and the safety and comfort of everyone else in the class. For our in-person meetings in this class, it is important that all of us feel
as comfortable as possible engaging in class activities while sharing an indoor space. Nonmedical masks that cover our noses and mouths are a primary tool for combating the spread of COVID-19. Further, according to the provincial mandate, masks are required in all indoor public spaces including lobbies, hallways, stairwells, elevators, classrooms and labs. Please eat or drink between classes. There may be students who have medical accommodations for not wearing a mask. Please maintain a respectful environment. UBC Respectful Environment Statement.

If Dr. Mitchell is feeling ill he will not come to class. He will communicate this as early as possible via a Canvas announcement. If this is the case lectures will likely be offered via Zoom and will be recorded.