1 Course Details

1.1 Calendar Description

The objective of this course is to expand on the introductory laboratory practices developed in HK 3600 Applied Human Kinetics I. Students will examine the functioning of a human body at rest and in motion, while learning clinical and advanced laboratory techniques. The students will be introduced to the underlying concepts of various physiological and biomechanical measures in lecture. Subsequently, the principles from the lecture will be used to make direct measures in the laboratory, with an emphasis on understanding exercise physiology, clinical testing practices, and integrative approaches to studying human movement. Students will be asked to critically analyze the laboratory measures and findings, and to integrate the lecture and laboratory material in formalized laboratory reports.

Pre-Requisites: HK*3600
Restrictions: Restricted to students in Human Kinetics.

1.2 Course Description

The objective of this course is to expand on the introductory laboratory practices developed previously in HK3600. Students will examine the functioning of a human body at rest and in motion, while learning clinical and advanced laboratory techniques. The students will be introduced to the underlying concepts of various physiological and biomechanical measures in lecture, similar to the format of HK 3600. The principles from lecture will then be used to make direct measures in the laboratory, with an emphasis on understanding exercise physiology, clinical testing practices, and integrative approaches to studying human movement. Students will be asked to describe the laboratory measures and findings, and to integrate the lecture and laboratory material in formalized laboratory reports.

1.3 Timetable

Lecture: Classes will be held online with a set time for M, W, F - 1:30-2:20 PM. Some exceptions may be made, allowing students to view course material on their own schedule.
when direct online interaction is not required.

Laboratories: All material will be based on the understanding and application of lab techniques / equipment for teaching labs normally held in JT Powell Building - rooms 2236 and 2237. In the event that physical distancing must be maintained and face-to-face labs cannot occur, lab techniques, demos and representative data will be pre-recorded and moved online, as is appropriate for the course content.

Section 0101: Tuesday – 10:00 PM – 12:50 PM
Section 0102: Tuesday - 2:30 PM - 5:20 PM
Section 0103: Wednesday - 2:30 PM - 5:20 PM
Section 0104: Thursday – 10:00 AM – 12:50 PM
Section 0105: Thursday – 2:30 PM – 5:20 PM

1.4 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Jamie Burr
Email: burrj@uoguelph.ca
Telephone: +1-519-824-4120 x52591
Office: HHNS Annex 263
Office Hours: Office hours by appointment (or during open hours on Friday during class)

Instructor: Stephen Brown PhD
Email: shmbrown@uoguelph.ca
Telephone: TBD
Office: ext. 53651 (Office)
Office Hours: Office hours by appointment (or during open hours on Friday during class)

2.2 Teaching Assistants
To arrange an appointment with your TA, please email or speak with him/her in laboratory. There are 8 different TAs for this class, please check which week it is in the course for the appropriate TA contact.

First 6 weeks;

Chris Pignanelli (Head TA) - cpignane@uoguelph.ca

Alexandra Coates (Assistant Head TA) - acoate01@uoguelph.ca

Additional TAs TBD

Second 6 weeks;

Devon Frayne - dfrayne@uoguelph.ca (Head TA)

Additional TAs TBD

3 Learning Resources

3.1 Required Resources

Courselink (Website)
This course will make use of the University of Guelph’s course website on D2L (via Courselink). Consequently, you are responsible for all information posted on the Courselink page for HK*4600. Please check it regularly.
Undergraduate Calendar (Website)  
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/  
is the source of information about the University of Guelph's procedures, policies and regulations, which apply to undergraduate programs. It can be found at the link above.

3.2 Recommended Resources

Exercise Physiology: Theory and application to fitness and performance (Textbook)  
There is no required textbook, however Exercise Physiology: Theory and application to fitness and performance textbook is recommended if additional background understanding is required.


3.3 Campus Resources

If you are concerned about any aspect of your academic program:

• make an appointment with a program counsellor in your degree program.

If you are struggling to succeed academically:

• There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.

If you are struggling with personal or health issues:
• Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.
• Student Health Services is located on campus and is available to provide medical attention.
• For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations.

If you have a documented disability or think you may have a disability:

• The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability.

If you have any concerns about the ethics of this course program, please contact the University of Guelph ethics officer, Katelyn Wadleigh, Telephone: (519) 824-4120, ext. 56606, E-mail: kwadleig@uoguelph.ca

4 Learning Outcomes
Course Learning Outcomes:

By the end of the course, students should be able to:

1. Perform and interpret functional respirometry tests
2. Perform and interpret basic 12-lead EKG traces
3. Determine cardiac output, and understand the relationships between cardiac output, heart rate, stroke volume and total peripheral resistance in healthy and diseased individuals
4. Recognize how exercise and hydration alters the relationships between cardiac output, heart, stroke volume and total peripheral resistance.
5. Have a working knowledge of peripheral skeletal muscle fatigue, and the ability to directly determine high and low-frequency fatigue
6. Further develop familiarity with EMG, including the use of frequency analysis to evaluate muscle fatigue.
7. Apply mechanical principles (inverse dynamics, energetics, tissue mechanics) in the
evaluation of human movement and tasks (e.g. occupational and clinical).
8. Understand and apply concepts in the evaluation of standing balance and gait.
9. Apply your working knowledge of key techniques used in human physiology and biomechanics testing and evaluation to the study of human health
10. Work effectively as part of a small group
11. Critically evaluate empirical data, and incorporate data into scientific reports that test hypotheses

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5 Teaching and Learning Activities

5.1 Lecture

<table>
<thead>
<tr>
<th>WEEK</th>
<th>Lecture/Lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEEK 1: JAN 11-15</td>
<td>Lecture – Respiratory physiology, and regulation of ventilation and pulmonary pathologies</td>
</tr>
<tr>
<td>WEEK 2: JAN 18-22</td>
<td>Lecture – Cardiac electrophysiology in health and disease. Lab 1 – Respiratory laboratory (Lab report required)</td>
</tr>
<tr>
<td>WEEK 3: JAN 25-29</td>
<td>Lecture - Regulation of cardiac output and relationship to exercise intensity. Lab 2 – ECG as a clinical tool (Lab 1 report due)</td>
</tr>
<tr>
<td>WEEK 4: FEB 1-5</td>
<td>Lecture - Regulation of oxygen delivery to skeletal muscle (Guest Lectures). Lab 3 – Determination of cardiac output</td>
</tr>
<tr>
<td>WEEK 5: FEB 8-12</td>
<td>Lecture – Regulation of blood pressure. Lab 4 – The influence of core body temperature on cardiac output. (Lab report required combining labs 3 and 4)</td>
</tr>
<tr>
<td>READING WEEK (FEB 15-19)</td>
<td>No class or lab</td>
</tr>
<tr>
<td>WEEK 6: FEB 22-26</td>
<td>Lecture – Guest lecture from a clinical exercise physiologist and review. Lab 5 – Understanding the regulation of blood pressure. (Labs 3/4 report due)</td>
</tr>
<tr>
<td>MID-TERM</td>
<td></td>
</tr>
<tr>
<td>WEEK 7: MARCH 1-5</td>
<td>Lecture - Biomechanics: What, why, how? Cool principles</td>
</tr>
</tbody>
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that regulate human movement, performance, growth and development

WEEK 8: MARCH 8-12
Lecture - EMG
Lecture - Impulse-momentum

WEEK 9: MARCH 15-19
LAB 6 - EMG measures of muscle fatigue (Lab report required)
Lecture - Inverse dynamics: how to estimate forces in the body

WEEK 10: MARCH 22-26
LAB 7 - Analyses of jump performance (Lab 6 report due)
Lecture - Mechanical energetics of human movement
LAB 8 - Inverse dynamics to predict the likelihood of injury in a stoop vs squat lift (Lab report required)
Lecture - Overview of Principles, Review
LAB 9 - Mechanical power (Lab 8 report due)

WEEK 11: MARCH 29-APRIL 2*

WEEK 12: APRIL 5-9
Week 13: April 12
Makeup for Friday, April 2 Class

FINAL EXAM TBA

6 Assessments

6.1 Marking Schemes & Distributions

Methods of Assessment:

<table>
<thead>
<tr>
<th>Form of Assessment</th>
<th>Weight (% final grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Reports (4 lab reports x 15%)</td>
<td>60%</td>
</tr>
<tr>
<td>Midterm Exam (50 minutes)</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam (2 hours)</td>
<td>20%</td>
</tr>
</tbody>
</table>
6.2 Assessment Details

Lab Reports (60%)
4 lab reports X 15 % - Lab reports are due the following week at the beginning of your lab section. Late lab reports without a valid documented reason are penalized 10% per day up to 5 days, after which the lab is marked as zero.

LABs #1, #3-4 (combined), #6 and #8 are mandatory to hand in. These are handed in at the beginning of lab time, ONE WEEK following the lab.

Midterm #1 (20%)
Date: Fri, Feb 26, 1:30 PM

Final Exam (20%)
Date: TBD, TBA

7 Course Statements

7.1 Course Teaching / Learning Approach

The course comprises a combination of lectures, applied labs and tutorials. You will perform a series of 9 labs. The emphasis of the course is on applied techniques that are relevant to those of you considering applied or research careers in human biomechanics, clinical exercise testing, ergonomics, occupational therapy, physiology, physiotherapy, sports injury rehabilitation, paramedics, medicine, chiropractic’s, etc. The general skills you obtain will also provide you with the ability to work in groups and successfully troubleshoot challenges in other work environments.

The key concepts and theory underlying each lab will be presented in a series of lectures, such that this material is presented to you in the week preceding the lab. The lecture material, and the labs, will be posted on the HHNS website and D2L.

Please read the lab before coming to class. It is also expected that you are familiar with the
lab procedures and progression prior to your lab.

7.2 Grading

If you are absent from classes during the semester, you will be expected to make up missed lecture and laboratory material on your own. Assignments handed in late will be penalized 10% for every day that it is late.

8 Department of Human Health and Nutritional Sciences

Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. B.Sc. Academic Advising or Program Counsellors

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. http://www.learningcommons.uoguelph.ca/
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help and http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. https://www.uoguelph.ca/counselling/
- Student Health Services is located on campus and is available to provide medical
attention. https://www.uoguelph.ca/studenthealthservices/clinic

- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations.
  http://www.selfregulationskills.ca/

8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) http://www.e-laws.gov.on.ca/index.html. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.
(https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml)

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

9.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and
alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-regregchg.shtml

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website
https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website
https://www.ridgetownc.com/services/accessibilityservices.cfm

9.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University’s policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that
instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

9.10 Illness

The University will not normally require verification of illness (doctor’s notes) for fall 2020 or winter 2021 semester courses. However, requests for Academic Consideration may still require medical documentation as appropriate.