

HK*4600 Applied Human Kinetics II [0.75] Winter 2017**Course Goal**

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.

Instructors:

Dr. Jamie Burr – Office: HHNS Annex (Behind Food Science) x 52591 burrj@uoguelph.ca

Dr. Stephen Brown- Office: ANNU 330B x 53651 shmbrown@uoguelph.ca

Lectures:

Lectures will be Monday, Wednesday and Friday from 1:30-2:20 in Rozanski Hall 103

Laboratories:

Laboratories will be run in JTP 208A at the following times;

Day	Time
Tuesday	11:30-2:20
Wednesday	2:30-5:20
Thursday	11:30-2:20
Thursday	2:30-5:20

There are eight TAs for this course

First 6 weeks;

Sebastian Jannas – sjannas@uoguelph.ca (Head TA)

Josh Slysz - jslysz@uoguelph.ca

Matthew Burns – mburns04@uoguelph.ca

Willem Pepler - wpepler@uoguelph.ca

Pierre Barbeau- pbarbeau@uoguelph.ca

Second 6 weeks;

Shawn Beaudette - sbeaudet@uoguelph.ca

Brendan Pinto - bpinto@uoguelph.ca

Alex Noonan - noonana@uoguelph.ca

Chris White - cwhite06@uoguelph.ca

Prerequisite(s): HK*3600

Co-requisite(s): None

Restriction(s): Registration in the Human Kinetics major.

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

Course Resources

Textbook: There is no required textbook, however *Exercise Physiology: Theory and application to fitness and performance*, Powers S.K. McGraw Hill, is recommended if additional background understanding is required.

Courselink: 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: 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: [Undergraduate Calendar](#)

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.

Course outline

Note: You must hand in two lab reports (#1 and #3-4 combined) in the first half of the course. You must hand in two labs (# 6 and #8) in the second half of the course.

Week	Lecture/Lab Topic
Week 1: Jan 9-13	Lecture – Respiratory physiology, and regulation of ventilation and pulmonary pathologies
Week 2: 16-20	Lecture – Cardiac electrophysiology in health and disease. LAB 1 – Respiratory laboratory (Lab report required)
Week 3: 23-27	Lecture - Regulation of cardiac output and relationship to exercise intensity LAB 2 – ECG as a clinical tool (Lab 1 report due)
Week 4: Jan 30-Feb 3	Lecture – Regulation of oxygen delivery to skeletal muscle LAB 3 – Determination of cardiac output
Week 5: Feb 6-10	Lecture – Regulation of blood pressure LAB 4 – The influence of core body temperature on cardiac output (Lab report required combining labs 3 and 4)
Week 6: Mon 13, Wed 15	Lecture – Guest lecture from a clinical exercise physiologist and review LAB 5 – Understanding the regulation of blood pressure (Labs 3/4 report due)
MID-TERM	Fri Feb. 17th in class
Reading Week (February 20-24)	
Week 7:Feb 27-Mar 3	Lecture - Biomechanics: What, why, how? Cool principles that regulate human movement, performance, injury, growth and development
Week 8: March 6-10	Lecture - EMG, muscle force, and muscle fatigue
Week 9: March 13-17	Lecture - Dynamics of human gait LAB 6 - EMG measures of muscle fatigue (Lab report required)

Week	Lecture/Lab Topic
Week 10: March 20-24	Lecture - Inverse dynamics: how to estimate forces within the body LAB 7 - Analyses of normal and altered gait (Lab 6 report due)
Week 11: March 21-31	Lecture - Energetics of human movement: impulse-momentum, work-energy theorems LAB 8 - Inverse dynamics to predict the likelihood of injury in a stoop vs squat lift (Lab report required)
Week12: April 3-7	Lecture - Overview of Principles, Review LAB 9 - Energetics of human jump landing (Lab 8 report due)
FINAL EXAM	Fri April 21st 7:00-9:00pm

Methods of Assessment:

Form of Assessment	Weight (% final grade)
Lab Reports (4 lab reports x 15%)	60%
Midterm Exam (80 minutes)	20%
Final Exam (2 hours)	20%

Course & University Policies

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, and be prepared to provide supporting documentation. See the undergraduate calendar for information on regulations and procedures for Academic Consideration: [Undergraduate Calendar - Academic Consideration](#)

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible. For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: [Centre for Students with Disabilities](#)

Academic Misconduct

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 discourages misconduct. 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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar: [Undergraduate Calendar - Academic Misconduct](#)

E-mail Communication

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

Drop Date

The last date to drop one-semester Winter 2017 courses, without academic penalty, is **Friday March 10**. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar: [Undergraduate Calendar - Dropping Courses](#)

Copies of out-of-class assignments

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

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

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 5% for every day that it is late.

General Campus Resources

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 Counselling](#)

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. [The Learning Commons](#)

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. [Counselling Services](#)
- Student Health Services is located on campus and is available to provide medical attention. [Student Health Services](#)
- 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. [Stress Management and High Performance Clinic](#)

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. For more information, including how to register with the centre please see: [Centre for Students with Disabilities](#)

If you have any concerns about the ethics of this course program, please contact the University of Guelph ethics officer, Sandy Auld, Telephone: (519) 824-4120, ext. 56606, E-mail: sauld@uoguelph.ca, Fax: (519) 821-5236.