HK*3810 Human Physiology II - Integrated Systems

Fall 2022
Section(s): CO1

Department of Human Health and Nutritional Sciences
Credit Weight: 0.75
Version 1.00 - September 06, 2022

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1 Course Details

1.1 Calendar Description

This course will build on the fundamental concepts and principles of communication systems developed in Human Physiology I and examine more complex physiological phenomena such as the control of blood volume and blood pressure, which integrates tissue of the cardiovascular system, the heart, vasculature and kidney, and acid-based physiology, which integrates the respiratory system and the kidney. Finally, all systems will be integrated to determine how the body responds to challenges such as altitude, exercise and shock (blood loss).

Pre-Requisites: HK*2810

1.2 Course Description

Physiology is characterized by the integration of biological systems in the body. Each system is built upon a foundation of concepts and principles that are repeatedly used to explain a variety of observations. This course will build upon the concepts and principles explored in Human Physiology I and will move forward to explore more complex physiological phenomena such as the control of blood volume and blood pressure (integrating tissues of the cardiovascular system, the heart, vasculature and kidney) and acid-base physiology (integrating the respiratory system and the kidney). The course will then explore how these integrated systems adapt in response to physiological challenges such as exercise, altitude and shock (blood loss). The course uses factual material and theories to explain the function of the organs or systems, and enables you to predict how these systems shift in life situations

1.3 Timetable

i). Tuesdays and Thursdays, 8:30-9:50am, ALEX 200, face-to-face delivery

Technology willing, live lectures will be recorded and made available to students after the face-to-face lecture is given.

ii). Fridays, 2:30pm-3:20pm,ROZH 101, face-to-face delivery

The Friday session will be group problem solving sessions. These sessions will not be recorded. Lectures may occur in this session and when they do these live lectures will be recorded, technology-willing, and posted following the lecture. See the tentative schedule for dates and topics/activities in the Friday sessions.

1.4 Final Exam

The final exam will be administered online during the exam period. The final exam is currently scheduled for **Monday December 5 2022** from **8:30am EST to 10:30am EST**. Note that the date and time are subject to change. Please see WebAdvisor for the latest information.

The final exam is currently scheduled to be a face-to-face exam.

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2 Instructional Support

2.1 Instructional Support Team

Instructor: Coral Murrant
Email: cmurrant@uoguelph.ca

Office Hours: Office hours Tuesdays 2:00-5:00

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Office Hours:

Students interested in scheduling a 1:1 meeting can email Dr. Castellani directly to request an appointment.

2.2 Teaching Assistants

Teaching assistants will monitor the discussion boards and can be available for meetings by email request.

TA	E-mail
Nicole Fletcher	fletchen@uoguelph.ca
Mackenzie Charter	charterm@uoguelph.ca
Leslie Ogilvie	ogilviel@uoguelph.ca

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3 Learning Resources

3.1 Required Resources

Courselink (Website)
https://www.courselink.uoguelph.ca

The course outline, a tentative lecture schedule, readings, and handouts for specific lectures can be found at the Courselink D2L site for the course. Students are encouraged to use discussion boards to share ideas and clarify questions. The discussion boards will be monitored from Sept. 11 to Dec. 1.

3.2 Recommended Resources

Physiology text (Textbook)

Textbook of Medical Physiology (Textbook)

The recommended textbook for the course is Textbook of Medical Physiology, 14th edition by Hall and is available at the University bookstore. The 12th and 13th editions are also acceptable textbooks for the course. Copies of the textbook are on reserve at the library.

Online resources include a student-derived set of resources the "e-book" at: https://books.lib.uoguelph.ca/human-physiology/

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. https://www.uoguelph.ca/uaic/programcounsellors

If you are struggling to succeed academically:

- There are numerous academic resources offered by the Learning Commons for a variety of courses, workshops related to online learning, time management, taking multiple choice exams, and general study skills.
- You can also set up individualized appointments with a learning specialist. https://learningcommons.lib.uoguelph.ca/

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

- Wellness Education and Performance Centre has many interactive recourses and offers peer to peer support related to multi-dimensional wellness

  https://wellness.uoguelph.ca/wec

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 visit the accessibility website.

  https://wellness.uoguelph.ca/accessibility

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4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Learn the fundamentals of heart, vasculature, kidney, and lung tissue function.

2. Apply the principles and concepts learned in HK*2810 to understand tissue function.
3. Integrate individual tissues to enable systems to work, i.e. integrate the heart, and vasculature to understand the cardiovascular system, integrate the lung and the kidney to understand the acid/base system.
4. Integrate the systems within the body to understand physiological regulation of regulated variables i.e. integrate the central nervous system with the cardiovascular system and kidney to determine how mean arterial pressure is regulated (which includes integrating principles and systems learned in HK*2810 with systems learned in HK*3810).
5. Integrate multiple systems to determine how whole body will respond to physiological challenges such as exercise and hemorrhage (which includes integrating all systems learned in HK*2810 with systems learned in HK*3810).
6. Demonstrate knowledge of the mechanistic explanations for physiological events at the cellular and tissue level and systems level.
7. Developed advanced problem solving and critical thinking skills by applying and integrating physiological principles, tissues and systems to solve physiological challenges such as left heart failure, right heart failure, systemic vasoconstriction, altitude, snorkeling, exercise, shock, etc.
8. Effectively communicate ideas and arguments in graphic and written form in assignments and tests for assessment.
9. Interpret data in tabular and graphic form in homework assignments and tests, in order to assess how the body responds to challenges.
10. Identify gaps in knowledge in the area of physiology.

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5 Teaching and Learning Activities

Course Philosophy

The philosophy of this course will be to show students that physiology is built on fundamental principles that are used to build the foundations of communication, which are in turn used and integrated to build systems within the body with higher order functions. This course will take an integrated approach to building physiological systems. The course will also take a problem-solving, critical thinking approach to understanding the material and building physiological systems. Following this pedagogical style, the testing style will be short and long answer where students must work through problems and show their work. Weekly tutorial assignments will be completed in groups and used to help students

with the short and long answer testing style.

5.1 Lecture

Topics:

DATE		SECTION	LECTURE	12th rea (pa
Sept 08	Thursday	1. Heart and vasculature	The cardiovascular system	
Sept 09	Friday		Heart bioelectricity	115-1
Sept 13	Tuesday		Heart bioelectricity	
Sept 15	Thursday		Cardiac cycle	104-1
Sept 16	Friday		Problem solving - practice	
Sept 20	Tuesday		Cardiac output	110-1 229-2 233-2
Sept 22	Thursday		Vasculature and flow	157-1 201-2

				731-7
Sept 23	Friday		Problem solving – graded (5%)	
Sept 27	Tuesday		Arterioles, Radius and TPR	191-2
Sept 29	Thursday		Capillaries	177-1 296-3
Sept 30	Friday		Problem solving – graded (5%)	
Oct 04	Tuesday		Cardiovascular mechanics	201-2
Oct 06	Thursday		Sensors	201-2
Oct 07	Friday		No class	
Oct 11	Tuesday		Fall Study Break - No class	
Oct 13	Thursday		TEST 1 (25%)	
Oct 14	Friday	2. Kidney	Structure	303-3
Oct 18	Tuesday		Tubular function	323-3

Oct 20	Thursday		Countercurrent Extracellular volume	345-3 355-3
Oct 21	Friday		Regulation	337-3 358-3 361-3 904-9 924-9
Oct 25	Tuesday		Regulation	213-2
Oct 27	Thursday		Regulation	
Oct 28	Friday		Problem solving – graded (5%)	
Nov 01	Tuesday	**3. Blood gas concentrations**	Pulmonary mechanics	465-4
Nov 03	Thursday		Pulmonary circulation	477-4
Nov 04	Friday		Problem solving – graded (5%)	
Nov 08	Tuesday		VA/Q and exchange	492-4 485-4 495-5

Nov 10	Thursday		O_2 and CO_2 sensors	
Nov 11	Friday		Regulation of blood gases	505-5
Nov 15	Tuesday	4.Integration	Acid/base physiology	379-3
Nov 17	Thursday		TEST 2 (25%)	
Nov 18	Friday		Acid/base physiology	
Nov 22	Tuesday		Acid/base physiology	
Nov 24	Thursday		Chronic hypoxia/altitude	527-5
Nov 25	Friday		Exercise	1031-
Nov 29	Tuesday		Cardiovascular shock	
Dec 01	Thursday		Cardiovascular shock	

6 Assessments

6.1 Marking Schemes & Distributions

Graded group problem solving will be completed in the lecture time in groups of 4 and will be short and long answer format. If a graded group problem solving assignment is not written then the weighting of the assignment will be added to the weighting of the next midterm. The tests will consist of short and long answer test questions. For graded group problem solving

assignment, any assignment grade that is lower than your next test grade will be dropped and the weighting of the dropped assignment added to the weighting of your test.

Form of assessment	Weight of assessment	Date of assessment	Course content	Learning outcome addressed
Group problem solving	5%	Sept-23	Practice problem solving and critical thinking: Heart and vasculature	1-10
Group problem solving	5%	Sept-30	Practice problem solving and critical thinking: Heart and vasculature	1-10
Test 1	25%	Oct-13	1. Heart and vasculature	1-9
Group problem solving	5%	Oct-28	Practice problem solving and critical thinking: Kidney	1-10
Group problem solving	5%	Nov-04	Practice problem solving and critical thinking: Blood gasses	1-10
Test 2	25%	Nov-17	2. Kidney and 3. Blood gasses	1-9
Test 3	30%	TBA - In final exam schedule	4. Integration	1-9

6.2 Assessment

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7 Course Statements

7.1 Technology in the Classroom

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)

8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

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-reg-regchg.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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

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, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. 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

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
