



HK*2810 Human Physiology I - Concepts and Principles

Winter 2023

Section(s): C01

Department of Human Health and Nutritional Sciences

Credit Weight: 0.50

Version 1.00 - January 09, 2023

1 Course Details

1.1 Calendar Description

This course will introduce the fundamental concepts and principles of communication systems (transport, ion movement, nerve and synapse, muscle) in humans. It will focus on primary physiological communication systems, such as the endocrine and central nervous systems, and integrate basic principles to understand larger systems such as the gastrointestinal tract.

Pre-Requisites: BIOC*2580, BIOL*1080

1.2 Course Description

Physiology has a foundation of concepts and ideas that are used repeatedly to explain a variety of observations. Lectures will focus on these fundamental concepts and principles and use them to explain the **communication** (the physiology of transport phenomena, ion movement, nerve and synapse, muscle). Once the bases for communication are built lectures will focus on communication systems such as the nervous system (**central nervous system**) and the hormonal system (**endocrine system**). Once the primary communication system are understood lectures will focus on integrating the principles of communication, the endocrine and the nervous system in order to get a larger system to work, the **gastrointestinal tract**. The course presents the factual material and theories used to explain the function of the organs or systems so that you are able to utilize this information in explaining life situations. The majority of the material is presented in the context of feedback control systems with emphasis on the function of the normative cell, tissue and body.

1.3 Timetable

Tuesdays and Thursdays 1:00-2:20pm, ROZH 101.

1.4 Final Exam

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

2 Instructional Support

There are 3 teaching assistants (TAs) as resources for this course. TA's will be monitoring the D2L bulletin board, be available to e-mail directly with questions, or to set up one on one meetings (~15 minutes). There will be extra question and answer sessions run by the professor prior to the final exam.

2.1 Instructional Support Team

Instructor:	Kerry Ritchie Dr.
Email:	ritchiek@uoguelph.ca
Office:	ANNU ANNEX, Rm 265
Office Hours:	Wednesdays 9:30am-11:30am on ZOOM. Please email me to set up an appointment in that window.

2.2 Teaching Assistants

Teaching Assistant (GTA):	Christopher Pignanelli
Email:	cpignane@uoguelph.ca
Office Hours:	By appointment.
Teaching Assistant (GTA):	Benjamin Dalton
Email:	bdalton@uoguelph.ca
Office Hours:	By appointment.
Teaching Assistant (GTA):	Sara Frangos
Email:	sfrangos@uoguelph.ca
Office Hours:	By appointment.

3 Learning Resources

3.1 Required Resources

Courselink (Website)

<https://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. In D2L you can submit questions on the course discussion board where TAs will be monitoring daily. The discussion board will be monitored from Jan. 9th to April. 7th, and will not be monitored after April 12th.

3.2 Recommended Resources

Human Physiology e-book, created by students for students (Other)

<https://books.lib.uoguelph.ca/human-physiology/>

In this course - we are fortunate to have a **FREE, online, open-access resource** that has been created by previous HK*2810 students, for current HK*2810 students - and was specifically designed to complement our course. This 'e-book' is hosted through the UoG library and can be accessed here <https://books.lib.uoguelph.ca/human-physiology/>

Another more traditional optional resource for the course is Textbook of Medical Physiology, 13th edition by Hall and is available at the University bookstore. The 11th and 12th edition are also an acceptable textbook for the course. Copies of the textbook are on reserve at the library.

4 Learning Outcomes

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, such as digestion. 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. Practice questions and posted answers will be available to help students with the short and long answer testing style.

4.1 Course Learning Outcomes

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

1. Students will learn the principle of communication in physiology and apply them to describe physiological phenomena.
 2. Students will be able to demonstrate knowledge of the mechanistic explanations for physiological events at the cellular and tissue level.
 3. Students will be able to integrate the principles of communication into problems related to human physiology.
 4. Students will have further developed problem solving and critical thinking skills.
 5. Students will be able to effectively communicate ideas and arguments in graphic and written form.
 6. Students will be able to interpret data.
 7. Students will be able to apply core concepts of physics and chemistry to the field of physiology.
 8. Students will be able to identify gaps in knowledge in the area of physiology.
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5 Teaching and Learning Activities

5.1 Tentative Course Structure and Content

Date	Section	Lecture Topic	11th Edition Readings (pages)	12th Edition Readings (pages)	13th Edition Readings (pages)
Jan 10	Communication: Principles	Intro & Transport	19-20,45-56	18-19,45-56	19-20, 47-58
Jan 12	Communication: Principles	Membrane potential Action potential	57-61,61-70	57-60,60-69	61-64,65-73
Jan 17	Communication: Principles	Synapse	85-89, 559-564	83-86, 546-557	89-92, 580-592
Jan 19	Communication: Principles	Regulation	910-915	887-891	931-935
Jan 24	Communication: Principles	Contractile cells	72-78, 89-91	71-89	75-95
Jan 26	Communication: Principles	Contractile cells	80-83, 92-99, 572-576	91-104, 560-563	97-112, 596-599
Jan 31	Communication: Principles	Monosynaptic reflex			
Feb 2	Communication: CNS	Nervous system concepts	577-584	559, 564-570	595, 600-606
Feb 7	Communication: CNS	Vision	626-645	609-627	647-665
Feb 9	Communication: Principles	MIDTERM 1			
Feb 14	Communication: CNS	Motor	673-697	655-665	695-706
Feb 16	Communication: CNS	Motor	698-713	667-678	707-719
Feb 28	Communication: Hormonal	Concepts	905-916	881-892	925-935
Mar 2	Communication: Hormonal	Ca ⁺⁺ and PO ₄ ³⁻	978-990	955-967	1001-1014
Mar 7	Communication: Hormonal	Pancreas	961-972	939-950	983-994

Mar 9	Communication: Hypothalamus Hormonal	918-926,931-939	895-902, 907-915	939-946, 951-959
Mar 14	Communication: Stimuli and function Hormonal	944-957	921-934	965-978
Mar 16	Communication: MIDTERM 2 Hormonal			
Mar 21	Communication: Male Female Hormonal	996-999,1003-1008,1011-1022,1031-1033,1036-1041	973-976, 978-984,987-999,1003-1009,1011-1015	1021-1024, 1026-1033, 1037-1050, 1055-1061, 1064-1068
Mar 23	Integration: GIT Structure, motility	771-790	753-772	797-816
Mar 28	Integration: GIT Secretion	791-806	773-787	817-832
Mar 30	Integration: GIT Digestion/absorption	808-817	789-798	833-842
Apr 4	Integration: GIT Regulation	785-786	767-768	811-812
Apr 6	Integration: GIT Regulation	795-799,800-801,804-805	777-780,782-783, 785-786	821-824, 826-827, 829-831

6 Assessments

6.1 Marking Schemes & Distributions

Name	Scheme A (%)	Scheme B (%)	Scheme C (%)	Scheme D (%)
Practice Questions 1	5	0	5	0
Midterm 1	25	30	25	30
Practice Questions 2	5	0	0	5
Midterm 2	25	30	30	25
Group - Mini Lesson	10	10	10	10
Final Exam	30	30	30	30
Total	100	100	100	100

6.2 Assessment Details

Practice Questions 1 (5%)

Date: Submit: Feb 1 Review: Feb 2/3, Online submission through PEAR platform

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8

- Course Content:
Communication - Principles

Midterm 1 (25%)

Date: Thu, Feb 9, 1:00 PM - , 2:20 PM, in-class

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8

- Course Content:
Communication -Principles

Practice Questions 2 (5%)

Date: Submit: March 8 Review: March 9/10, Online submission through PEAR platform

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8

- Course Content:
Communication - CNS
Communication - Hormones (half)

Midterm 2 (25%)

Date: Thu, Mar 16, 1:00 PM - 2:20 PM, in-class

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8

- Course Content:
Communication -CNS
Communication - Hormones (half)

Physiology Connections - Mini Lesson (10%)

Date: Thu, Mar 30, 11:59 PM, Submit online to courselink dropbox.

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8

Course content: Pick from any section of the course that sparked your curiosity!

- Communication - Principles
- Communication - CNS
- Communication - Hormones
- Integration - GIT

Final Exam (30%)

Date: TBA

Learning Outcome: 1, 2, 3, 4, 5, 6, 7, 8

- Course Content:
Communication - Principles

Communication - CNS
Communication - Hormones*
Integration - GIT*

*emphasis on material not yet tested

6.3 Midterms

All midterms will use a short and long answer format. As midterms will be written in class time, there will be no alternate times to write a midterm. If you are unable to write a midterm due to illness or compassionate reasons, your other midterm/exam will be re-weighted to 35%/45% (midterm/final).

6.4 Practice Questions

In order to prepare students for the written format that we will use for the midterms and exam, a practice question will be posted prior to each midterm for students to complete on the day specified (see table above). You are expected to answer your question individually (although you can use your notes), and submit your answer electronically using the PEAR system (**more information will be given during lecture**). The day after the practice questions are completed, an answer key will be posted by the instructor, and students will use it to review 2 of their peers' answers as well as their own. You will have 2 days to complete the reviews. Your grade on the practice question (worth 5%) will be equally divided as 2.5% based on your performance on the question and 2.5% for completing the reviews. No late submissions will be accepted. Failure to complete the practice question by the deadline will result in your midterm being re-weighted to 30%.

6.5 Group Project: Physiology Connections - Mini Lesson

In HK*2810 – Human Physiology, we focus largely on learning the core principles of communication and start to see how these concepts are repeated over and over throughout physiology to make larger systems work. But these physiology principles are present in your everyday life too! To encourage excitement, discussion, creativity and provide more flexibility to demonstrate your learning, we are introducing a new assessment in the course – “Physiology Connections” to encourage you all to have an ‘a-ha!’ moment of connection with course material beyond an academic setting.

The goal of the assignment is to identify a course concept (from any point in our course) and show how it exists in your real life through a pre-recorded **mini lesson** (3 min max!). Each year, students find ‘fun examples’ of Phys that they have come across naturally as the course progresses, and it is a real learning opportunity to think about course concepts more broadly. I want to capture this curiosity on a broader scale.

This assignment will be completed in teams of 4 (pre-assigned in the groups tab on

courselink). The assignment is worth 10%, and it is due by March 30th (submit online to Dropbox by 11:59pm). More details will be provided in class and posted to our courselink site by the 3rd week of the semester.

7 Course Statements

7.1 Grading

- As midterms will be written in class time, there will be no alternate times to write a midterm. If you are unable to write a midterm due to illness or compassionate reasons, your other midterm and final exam will be re-weighted to 35%/45% (midterm/final).
- Practice Questions: No late submissions will be accepted. Failure to complete the practice question by the deadline will result in the corresponding midterm being re-weighted to 30%.

7.2 Technology in the Classroom

This course is taught primarily through hand written notes. Many students really enjoy putting 'pen to paper' and over the years have consistently communicated that this strategy helps them process the material better. However, you are also welcome to bring a tablet or laptop to lectures, but only use it in a manner that will not disturb those around you. Please do not use your laptop for anything other than activities related to this physiology course. Please turn your cell phones off, or put them on silent, and refrain from using phones in any way that would distract the students around you.

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

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