

MDSC 404 – Course Outline F25&W26

Integrative Human Physiology

Course Director & Instructor

Dr James E. Fewell, PhD
Professor, Department of Physiology & Pharmacology
Alberta Children's Hospital Research Institute

Instructors:

- Neurophysiology, Endocrine, Cardiovascular, Respiratory & Renal
Dr. James Fewell, Ph.D. (fewell@ucalgary.ca)
- Gastrointestinal & Liver
Dr. Donna-Marie McCafferty, Ph.D. (dmmccaff@ucalgary.ca)

Office Hours/Policy on Answering Student Emails:

- Office hours will be set and communicated by individual instructors.
- Please note that all course communications must occur through your@ucalgary.ca email. Emails from your@ucalgary.ca account will be answered Monday to Friday from 0800 to 1600 within 48 hours of receipt; questions regarding unit material will not be answered within 24 hours of a unit examination.

Teaching Assistant:

- Mr. Moon Jeong

Time:

- Sessions will normally be held Monday, Wednesday, and Friday from 1510 to 1600 **Please Note:** The learning facilitator and teaching assistant will be available from 1600 to 1650 after each session to answer questions regarding session/course material.

Important Dates:

Fall Term

- First day of class: Wednesday, September 3rd
- National Day for Truth and Reconciliation: Tuesday, September 30th
- Thanksgiving Day: Monday, October 13th; no class
- Fall term break: Sunday-Saturday, November 9th-15th; no classes
- Fall expository essay due Friday, November 21st

- Last day of class: Friday, December 5th

Winter Term

- First day of class: Monday, January 12th
- Winter term break: Sunday-Saturday February 15th-21st, no classes
- Winter expository essay due, Monday March 30th
- Last day of class: Monday, April 13th

Prerequisite:

- Enrolment in the BHSc Honours program and completion of MDSC 351 or consent of the course coordinator.

Course Description:

- Physiology is defined as the study of how living organisms function and encompasses the integration of processes from molecules to the whole organism. MDSC 404 provides fundamental principles and concepts about the physiology of major human organ systems.

Overarching Theme:

- Course format consists of lectures provided by published scholars as well as student-initiated discussions of various topics.

Global Objective:

- The global objective of MDSC 404 is to provide a founding in integrative human physiology.

Course Learning Outcomes:

- By the end of this course, students will have a founding in integrative human physiology that will allow them: a) to recall fundamental principles and concepts regarding physiology of the nervous system, endocrine system, cardiovascular system, respiratory system, renal system and gastrointestinal system, b) to apply these physiological principles and concepts to predict the body's response to perturbations that disrupt homeostasis, and c) to predict how disease or injury of an organ can lead to disordered function (i.e., pathophysiology) and disrupt homeostasis.

EDIA Statement

- It is the intent that MDSC 404 well serves students from diverse backgrounds and perspectives in an equitable fashion. We will strive to create a safe, brave, inclusive, and accessible learning environment where individual needs are addressed both in and out of class via lectures, tutorial sessions, and one-on-one discussions. We will be mindful and respectful of diversity and view it as a resource and strength that enriches the class.

Concerning the discipline of physiology, we will attempt to demystify the “textbook person” as a paradigm of normality and consider the physiology of varied populations.

Transferable Skill Development:

- Many of the skills and abilities that you are developing in your coursework are transferable to the workforce, graduate and professional studies and other facets of life. Employers seek applicants with transferable skills because they can be an asset in the workplace, regardless of industry or sector. Transferable skills are core skills for your success in building your future career.

The work that you will do in MDSC 404 will help you build the following transferable skills:

- **Collaboration:** Work respectfully with others from different backgrounds, cultures, and countries.
- **Verbal Communication:** Learn and share information by presenting, listening, and interacting with others.
- **Creativity and Innovation:** Find different and better ways to do things, being curious, thinking imaginatively.
- **Critical Thinking:** Actively and skillfully conceptualize, apply, analyze, synthesize, and/or evaluate information (data, facts, observable phenomena, and research findings) to make a reasoned judgement or draw a reasonable conclusion.
- **Digital Skills:** Use digital technologies like computers, social media, virtual meeting platforms, and the internet.
- **Information Literacy:** Find, understand, and use information presented through words, symbols, and images
- **Numeracy:** Use mathematical information such as numbers, symbols, words, and graphics to do tasks.
- **Problem solving:** Identify an issue, find and implement a solution, and assess whether the situation has improved.
- **Project Management:** Conceptualize, initiate, plan and execute a plan to achieve a predetermined goal (project) by effectively prioritizing activities and meeting deadlines.
- **Written Communication:** Share ideas and information by using words, images, and symbols.

Recommended Textbooks

- Derrickson’s Human Physiology, 3rd edition, John Wiley and Sons, 2024.

A Note regarding readings

- A list of required readings for all course units will be outlined on D2L and links and documents will be made available, where appropriate. Required readings have been chosen carefully to inform you and enhance the lecture material. **Students are REQUIRED to complete assigned readings BEFORE each lecture.** Instructors will proceed in class assuming that students have read the assigned readings completely.
- Students should be aware that many of the readings they will be assigned might be of an unfamiliar nature and style. Students should allot sufficient time to allow for several reads of the assigned material.

Learning Technology Requirements

Brightspace (by D2L) is located on the University of Calgary server and will be used extensively for communication with students. **It is the student's responsibility to ensure that they receive all posted communications and documents and that they receive emails sent by instructors or fellow students through D2L.** Only your @ucalgary.ca email address may be linked to D2L. Please ensure that you regularly check your @ucalgary.ca account.

A laptop, desktop, tablet or mobile device is required for D2L access. If you need help accessing or using D2L, please visit the Desire2Learn resource page for students:

<http://elearn.ucalgary.ca/d2l-student/>.

Evaluation

The University policy on grading and related matters is described in section F of the 2025-2026 Calendar.

In determining the overall grade in MDSC 404, the following weights will be used:

- Six unit examinations will make up 80% of your final grade. The examination schedule is as follows:

Unit	Unit Lead	Examination Date
Neurophysiology Examination	Dr J Fewell	Wednesday - October 1
Cardiovascular Examination	Dr J Fewell	Friday – October 31
Respiratory Examination	Dr J Fewell	Friday – December 5
Renal Examination	Dr J Fewell	Friday – February 6
Endocrine Examination	Dr J Fewell	Wednesday – March 11
GI & Liver Examination	Dr DM McCafferty	Monday – April 13

- Two expository essays, one each term, will make up 20% of your final grade. The due dates for the Expository essays are as follows:

Term	Unit Lead (s)	Due Date
Fall Term Expository Essay	Dr J Fewell	Friday – November 21
Winter Term Expository Essay	Drs J Fewell & DM McCafferty	Monday – March 30

The six unit examinations will be recorded on a percentage basis and used to determine your unit examination mark after dropping the lowest unit examination mark. You are required to write all six unit examinations. The mark on the last unit examination (i.e., GI & Liver) must be within 1 standard deviation of the mean of the previous five unit examinations for it to be dropped. Scheduled unit examinations will consist of multiple choice, multiple select, true-false, and fill-in-the-blank questions as well as short answer and/or problem-solving questions.

Unit examinations will cover lecture material and assigned readings.

- All examinations will be closed-book, but a nonprogrammable calculator may be used.
- A passing grade on any examination is not essential to pass MDSC 404.
- Students in MDSC 404 are not expected to participate as subjects in research projects of professors involved in the course.

Topics for expository essays will be provided early in each term. An expository essay requires exploring a particular subject and presenting your findings in a well-structured and objective argument; in this type of essay, you study a topic or problem and “expose” what you have learned. Typically, the layout of this essay uses a traditional 5-paragraph structure (e.g., an Introduction which contains general information, provides context and ends with a thesis statement; a main body that consists of 3 or more paragraphs that focus on particular ideas and/or material; and a conclusion in which the thesis statement is revisited, and conclusions are drawn from the information provided in the body of the essay).

The expository essays require that you use the fundamental physiological principles and concepts presented in didactic sessions and assigned readings complemented by a review of the scientific literature to predict the body’s response to selected perturbations that disrupt homeostasis, and/or to predict how a given disease or injury can lead to disordered function (i.e., pathophysiology) that disrupts homeostasis.

The essays are due two weeks before the end of each term (i.e., Fall Term - Friday, November 21st & Winter Term - Monday, March 30th). Extensions will NOT be granted for dates of submission of essays. *Essays will not be marked and assigned zero percent if not submitted on D2L by 1159 on the due date.* The topics of the first expository essay will be aligned with neurophysiology, cardiovascular physiology and respiratory physiology content; the topics of the second expository essay will be aligned with renal physiology, endocrine physiology and GI physiology content. You will be asked to choose one of at least three potential topic options for each of your essays.

A Note regarding Writing Assignments:

Writing skills are important to academic study in all disciplines. In keeping with the University of Calgary’s emphasis on the importance of academic writing in student assignments (section E.2 of 2025-26 Calendar), writing is emphasized, and the grading thereof in determining a student’s mark in this course. The Bachelor of Health Sciences values excellence in writing. Competence in writing entails skills in crafting logical, clear, coherent, non-redundant sentences, paragraphs and

broader arguments, as well as skills with the mechanics of writing (grammar, spelling, punctuation). Sources used in research papers must be properly documented. The University of Calgary offers instructional services through the Students' Success Centre's Writing Support Services (<http://www.ucalgary.ca/writingsupport/>) for students seeking feedback on assignments or seeking to improve their general writing skills. Students are **strongly encouraged** to take advantage of these programs.

Grading Scheme:

Letter Grade	Description	Percentage
A+	Outstanding performance	96-100
A	Excellent performance	90-95.99
A-	Approaching excellent performance	85-89
B+	Exceeding good performance	80-84
B	Good performance	75-79
B-	Approaching good performance	70-74
C+	Exceeding satisfactory performance	65-69
C	Satisfactory performance	60-64
C-	Approaching satisfactory performance	57-59
D+	Marginal pass	54-56
D	Minimal pass	50-53
F	Does not meet course requirements	0-49

Missed Components of Term Work:

Extensions will NOT be granted for dates of submission of the two essays.

As per University Calendar Section G.2.3 **students who are absent from an in-class assessment will receive a mark of zero on the missed component.** Deferred examinations are allowed only in the following circumstances: debilitating illness, severe domestic affliction, religious conviction, religious observance or absence due to a faculty-approved activity. Traffic jams and late or full buses are common events in Calgary and are NOT acceptable reasons for late arrivals to class, meetings and examinations. Please note that while absences are permitted for religious reasons, students are responsible for providing advance notice and adhering to other guidelines on this matter, as outlined in the University Calendar

<https://calendar.ucalgary.ca/pages/02ffccb6b1a541db880fe4223d122b5e>

Deferred examinations will not be granted if a student:

- Misses an exam without just cause.
- Personal scheduling conflicts (e.g., travel).
- Misreads the exam schedule.
- Submits an exam for marking.

If you wish to defer an examination, you must contact the unit lead BEFORE the time of the scheduled examination.

Course Evaluations and Student Feedback

Student feedback will be sought at the end of the course through the Universal Student Rating of Instruction (USRI) and a qualitative student evaluation. Students are welcome to discuss the course process and content at any time with the instructor. Students may also address any concerns they may have with Dr. Fabiola Aparicio-Ting, Associate Dean (Undergraduate Health and Science Education) in the Cumming School of Medicine (eaparic@ucalgary.ca).

Attendance

Regular attendance is advised in order to succeed in MDSC 404. Students are expected to take notes during class and should not rely solely on material supplied by the instructors. Instructors may or may not post lectures notes to D2L, at their individual discretion. In-class discussion and all content presented in class, including concepts and examples, can constitute substantial learning and can be considered for assessment.

Conduct During Lectures

The classroom should be respected as a safe place and a brave space to share ideas without judgement - a community in which we can all learn from one another. Students are expected to frame their comments and questions to lecturers in respectful and appropriate language, always maintaining sensitivity towards the topic. Students, employees, and academic staff are also expected to demonstrate behaviour in class that promotes and maintains a positive and productive learning environment.

As members of the University community, students, employees and academic staff are expected to demonstrate conduct that is consistent with the University of Calgary Calendar, the Code of Conduct and Non-Academic Misconduct policy and procedures, which can be found at <https://www.ucalgary.ca/student-services/student-conduct/policy>

Use of Internet and Electronic Communication Devices in Class

The Bachelor of Health Sciences program aims to create a supportive and respectful learning environment for all students. The use of laptop and mobile devices is acceptable when used in a manner appropriate to the course and classroom activities. Research studies have found, however, that inappropriate/off-topic use of electronic devices in the classroom negatively affects the learning of others during class time.

Students are responsible for being aware of the University's Internet and email use policy, which can be found at <https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-electronic-resources-and-information-policy>.

Use of Artificial Intelligence Tools

You may use generative artificial intelligence tools and apps for learning course material, but their use is **strictly prohibited** in your expository essay assignments. This includes ChatGPT and other AI writing assistants. Use of generative AI may be considered use of an unauthorized aid, which is a form of cheating and a breach of academic integrity subject to Academic Misconduct procedures. You may be asked to provide evidence of your own work. While we appreciate that the use of AI tools is appropriate in some contexts, in this course we will be focusing on building your own critical thinking, foundational knowledge and writing skills, which could be compromised by a reliance on AI tools.

Furthermore, students *are not allowed* to upload class slides, assignment instructions, or other course materials to AI tools or platforms. These are the intellectual property of the course instructor (IP); uploading these to an AI platform may breach IP rules since some of these sites may use these as training/output data.

UNIVERSITY OF CALGARY POLICIES AND SUPPORTS

Copyright

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy>) and requirements of the Copyright Act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks, etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy <https://www.ucalgary.ca/legal-services/university-policies-procedures/student-non-academic-misconduct-policy>

Instructor Intellectual Property

Course materials created by instructors (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may **NOT** be reproduced, redistributed or copied without the explicit consent of the professor. **The posting of course materials to third party websites such as note-sharing sites without permission is prohibited.** Sharing of extracts of these course materials with other students enrolled in the course **at the same time** may be allowed under fair dealing.

Academic Accommodations

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at <https://ucalgary.ca/student-services/access/prospective-students/academic-accommodations>. Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for

Accommodations for Students with Disabilities (<https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>).

Students who require an accommodation in relation to their coursework based on a Protected Ground other than Disability should communicate this need in writing to Dr. Fabiola Aparicio-Ting (feapartic@ucalgary.ca), Associate Dean (Undergraduate Health and Science Education).

Academic Misconduct

The University of Calgary is committed to the highest standards of academic integrity and honesty. The University of Calgary has created rules to govern all its members regarding the creation of knowledge and the demonstration of knowledge having been learned.

Academic Misconduct refers to student behaviour that compromises proper assessment of a student's academic activities and includes (but is not limited to): cheating, fabrication, falsification, plagiarism, unauthorized assistance, failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses, and failure to comply with exam regulations applied by the Registrar. **It also includes using of third party websites/services to access past/current course material, essay/assignment writing services, or real-time assistance in completing assessments, seeking answers to assessment questions and similar, whether paid, bartered or unpaid.**

For information of the Student Academic Misconduct Policy and Procedures, please visit; <https://www.ucalgary.ca/legal-services/university-policies-procedures/student-academic-misconduct-policy>.

Additional information is available on the Academic Integrity website at: <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>.

Recording of Lectures

Audio or video recording of lectures (or similar) is prohibited except where explicit permission has been received from the instructor.

Freedom of Information and Protection of Privacy Act

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

Appeals

If there is a concern with the course, academic matter or a grade, first communicate with the instructor. If these concerns cannot be resolved, students can proceed with an academic appeal, as per Section I of the University Calendar. Students must follow the official reappraisal/appeal process and may contact the Student Ombuds' Office

(<http://www.ucalgary.ca/student-services/ombuds>) for assistance with this and with any other academic concerns, including academic and non-academic misconduct. Students should be aware that concerns about graded term work may only be initiated **within 10 business days** of first being notified of the grade.

<https://calendar.ucalgary.ca/pages/e31a7115dca740ec83579e946d4a4193>

Sexual and Gender-Based Violence Policy

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at <https://www.ucalgary.ca/legal-services/university-policies-procedures/sexual-and-gender-based-violence-policy>.

Resources for Support of Student Learning, Success, Safety and Wellness

Student Success Centre - <http://www.ucalgary.ca/ssc/>

Student Wellness Centre - <http://www.ucalgary.ca/wellnesscentre/>

Student Advocacy and Wellness Hub (CSM students)

<https://cumming.ucalgary.ca/student-advocacy-wellness-hub/home>

Distress Centre - <http://www.distresscentre.com/>

Library Resources - <http://library.ucalgary.ca>

Wellness and Mental Health Resources

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (<https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy (<http://www.ucalgary.ca/mentalhealth/>).

Student Ombuds' Office

The Student Ombuds' Office supports and provides a safe, neutral space for students. For more information, please visit www.ucalgary.ca/ombuds/ or email ombuds@ucalgary.ca

BHSc Student Faculty Liaison Committee (SFLC)

The BHSc SFLC, with elected representatives from all majors, serves to raise issues of interest to BHSc students to the program administration, including items pertaining to curriculum, scheduling and events. A list of current representatives can be found on the BHSc website.

Student Union (SU) Information

The SU Vice-President Academic can be reached at (403) 220-3911 or suvpaca@ucalgary.ca; the SU representatives for the Cumming School of Medicine can be reached at medrep1@su.ucalgary.ca or medrep2@su.ucalgary.ca.

Student Success Centre

The Student Success Centre provides services and programs to ensure students can make the most of their time at the University of Calgary. Our advisors, learning support staff, and writing support staff assist students in enhancing their skills and achieving their academic goals. They provide tailored learning support and advising programs, as well as one-on-one services, free of charge to all undergraduate and graduate students. For more information visit: <https://www.ucalgary.ca/student-services/student-success>

Emergency Evacuation/Assembly Points

As part of the University of Calgary Emergency Evacuation plan, students, faculty, and staff should locate the closest Assembly Point in case of Fire Alarm. Safety signage is posted throughout the campus showing the locations and the possible route to these locations. All students, faculty, and staff are expected to promptly make their way to the nearest Assembly Point if the Fire Alarm is activated. No one is to return into campus facilities until an all clear is given to the warden in charge of the Assembly Area. For more information, see <https://www.ucalgary.ca/risk/emergency-management/drills/assembly-points-and-evacuation-maps>

Safewalk

Campus security will escort individuals, day or night, anywhere on campus (including McMahon Stadium, Health Sciences Centre, Student Family Housing, the Alberta Children's Hospital and the University LRT station). Call 403-220-5333 or visit <http://www.ucalgary.ca/security/safewalk>. Use any campus phone, emergency phone or the yellow phone located at most parking lot pay booths. Please ensure your personal safety by taking advantage of this service.