

MDSC 569.06 – Course Outline F25

Advanced Topics in Physiology – Life Before Birth

Course Director & Instructor

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Office Hours/Policy on Answering Student Emails

- Contact me by email (fewell@ucalgary.ca) to set up an appointment.
- Emails will be answered Monday to Friday from 0800 to 1600; questions regarding course material will be answered within 24 hours.
- Please note that all course communication must occur through your @ucalgary email.

Time

- Lectures, presentations and discussions will be held in person on Mondays and Wednesdays from 1300 to 1415. Tutorials, as needed, will be held in person or via Zoom on Fridays from 1300 to 1350.

Important Dates

- 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
- Last day of class: Friday, December 5th

Prerequisite

MDSC 404 Integrative Human Physiology, ZOOL 463 Animal Physiology II, or consent of the course coordinator

Course Description

Designed for undergraduates with a general understanding of human physiology who wish to pursue advanced topics in a physiological system(s). The physiological system offered will vary from year-to-year and students should contact the instructor for more information prior to enrolling in the course. There will be a review and then build on basic physiological principles through a series of lectures and/or discussion groups. An examination of the specified area of physiology in-depth by introducing students to research methodologies and pathological processes.

Overarching Theme

This course is based on the flip-classroom education method of facilitated learning. All sessions will be facilitated by a published scholar in perinatal physiology and will require student participation in presentations and discussions. “Life Before Birth” will address conception, maternal adaptation to pregnancy, fetal/placental development & events leading to parturition, including the following potential topics:

- Biological milestones in the womb
- Fertilization: Egg meets sperm
- Implantation: Uterine adaptations
- Placental development: Our first lung, gut, kidney, and endocrine glands
- Developmental origins of health & disease, aka The Barker Hypothesis
- Maternal cardiovascular & respiratory adaptation to pregnancy
- Fetal responses to challenges: the fetus is not just a small adult
- Fetal paradoxical breathing response to oxygen lack
- Fetal breathing and lung fluid secretion – role in normal lung development
- The fetal circulation and role of vascular shunts
- The brain: the fetal control centre
- Fetal growth restriction
- Baby on board don’t abuse - maternal stress, smoking and alcohol intake

Global Objective

The global objective of MDSC 569 is to establish a foundation for integrative human physiology concerning the mother and fetus.

Course Learning Outcomes

By the end of this course, students will:

- Develop a deeper understanding of conception and in-utero life, including physiological processes
- Enhance skills in independent learning, oral presentations, and scientific writing
- Understand how to critically evaluate a journal article
- Learn to engage with a peer group using scientific knowledge argument
- Enhance proficiency in posing inquiries to colleagues and responding to their questions regarding scientific presentations and class discussions

EDIA Statement

It is the intent that MDSC 569 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 you develop 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 569 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
- **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 Textbook

Life Before Birth – The Challenges of Fetal Development by Professor Peter W. Nathanielsz, Life Course Health Press, 2021.

A Note regarding readings

- A list of required readings for MDSC 569 will be outlined on D2L and links and documents will be made available, where possible. Required readings will be carefully chosen to enhance your learning experience. **All students are REQUIRED to attend every session and to complete assigned readings BEFORE each session.** Discussions in class and in tutorials will be conducted with the assumption that the assigned readings have been completed.
- Students should be aware that many of the readings they will be assigned may 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 the course, the following weights will be used for assessments:

- Evaluation of short essays (maximum one page, excluding figures, tables, or references): According to the course schedule, each registered student must complete these essays at regular intervals, contributing **a total of 40%** towards the overall mark (see submission schedule below). Essays should be submitted to the D2L Dropbox, where they will be marked and returned before the next scheduled due date. Late assignments will NOT be accepted and will automatically receive a score of zero (refer to Missed Components of Term Work below). Rubrics for evaluating essays will be provided on D2L.
- Evaluation of oral presentations by groups using PowerPoint and/or any other visual aids will account for **50% of the total mark**. Groups will be assigned randomly on the first day of class. Each group will present four times over the course. Each presentation will contribute 25% to the total mark. Rubrics for evaluating presentations will be provided on D2L. All group members must be present for both the group presentation and the Q&A session where appropriate.
- Class participation will account for **10% of the total mark**. This is a facilitated learning environment, and students are expected to arrive prepared and engage in class discussions and Q&A sessions. Students will need to sign in at the beginning of each class.
- A student's final grade for the course is the total of the individual assignments. It is not necessary to pass each assignment separately to pass the course.
- A final examination will NOT be held.

Assessment *	Weight (% of Grade)	Due Date and Time	Alignment with Course Learning Outcomes
*One-page essays (as outline above)	40%	<i>Fridays @ 2359:</i> <u>Essay 1</u> Sept 19 <u>Essay 2</u> Oct 10 <u>Essay 3</u> Oct 31 <u>Essay 4</u> Nov 21	Topics will be determined by the Course Instructor and will directly align with Overarching Themes & Course Learning Outcomes
**Group presentations (as outlined above)	50%	Sept 22 to Dec 3	Topics will be selected the Course Instructor and by groups during class and will directly align with Overarching Themes & Course Learning Outcomes
***Class participation	10%		Active contributions during class directly align with Course Learning Outcomes

*Rubrics for essay evaluation will be available on D2L

**Rubrics for group presentation evaluations will be available on D2L

***Students will be required to sign in for each class

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 to complete each assessment must be properly documented using appropriate citations. 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	Did not meet course requirements	0-49

Missed Components of Term Work

Late assignments for essays will not be accepted and will automatically receive a mark of zero. 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.** Students who are absent are responsible for contacting the instructor to discuss the impact of their missed assessment. Alternative opportunities for completing missed assessments or shifting of the assessment weight **may** be possible but are not guaranteed.

Extensions will NOT be granted on any assignment or class presentation in MDSC 569. The only exceptions to this are those in keeping with the University Calendar (debilitating illness, religious conviction, or severe domestic affliction) that are received in writing and with supporting documentation. Traffic jams and late or full buses are common events in Calgary and are NOT acceptable reasons for late arrivals to class. 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>

Course Evaluations and Student Feedback

Student feedback will be sought at the end of the course through the new UCalgary Course Experience Survey and a qualitative student evaluation. Students are welcome to discuss the process and content of the course 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 (feapartic@ucalgary.ca).

Attendance

Regular attendance to class is required. In-class discussion and all content presented in class, including concepts and examples, can constitute substantial learning opportunities.

Conduct During Class

The classroom should be respected as a safe place to share ideas without judgment—a community where we can all learn from one another. Students are expected to frame all comments and questions in respectful and appropriate language, always maintaining sensitivity toward the topic. Both students and academic staff are also expected to demonstrate behavior in class that promotes and maintains a positive and productive learning environment.

As members of the University community, both students and academic staff are expected to exhibit conduct that is consistent with the University of Calgary Calendar, the Code of Conduct, and the Non-Academic Misconduct policy and procedures, which can be found at <https://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. However, research studies have found 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

Generative Artificial Intelligence (AI), and specifically foundational models that can create writing, computer code, and /or images using minimal human prompting includes not only GPT-4 (and its siblings ChatGPT and Bing), but many writing assistants that are built on this or similar AI technologies.

Students may use artificial intelligence tools for creating an outline for essays but the **final submitted essay must be original work produced by the individual student alone; students are ultimately accountable for the work they submit. This use must be documented in an appendix for each essay.** The documentation should include what tool(s) were used, how they were used, and how the results from the AI were incorporated into the submitted work. You could also be asked to provide evidence of your own work. **Failure to cite the use of AI generated content in an essay will be considered a breach of academic integrity and subject to Academic Misconduct procedures.**

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.