MDSC 308
Interdisciplinary Approaches to Research

Course Coordinator:

Dr. Ebba Kurz, PhD

Instructors:

Biomedical Sciences

Dr. Ebba Kurz, PhD
Associate Dean (Undergraduate Health and Science Education)
Director, Bachelor of Health Sciences Program
Professor, Physiology and Pharmacology
kurz@ucalgary.ca

Teaching Assistant:
Ms. Shannon Snelling shannon.snelling@ucalgary.ca

Bioinformatics

Dr. Marco Gallo, PhD (Fall term)
Associate Professor, Biochemistry and Molecular Biology
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Dr. Jason de Koning, PhD (Winter term)
Assistant Professor, Biochemistry and Molecular Biology
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Teaching Assistant:
Ms. Afarinesh Panahy afarinesh.panahy@ucalgary.ca

Health and Society

Dr. Reed Beall, PhD
Assistant Professor, Community Health Sciences
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Teaching Assistant:
Ms. Seham Elmrayd (seham.elmrayed1@ucalgary.ca)

Research Ethics

Dr. Juliet Guichon, SJD
Associate Professor, Community Health Sciences
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Teaching Assistant:
Ms. Sara Cho sara.cho@ucalgary.ca

Ms. Maria Dalton maria.dalton1@ucalgary.ca

Office Hours/Policy on Answering Student Emails
Faculty and teaching assistants are available to meet by appointment.

Students contacting the instructors or teaching assistants via email can expect a response within **48 hours** (excluding weekends and statutory holidays). Substantive issues should be addressed by appointment.

ALL communication must occur through your @ucalgary email address.

Time and Location:
Tuesdays and Thursdays 12:00pm – 2:50pm
Theatre One – for the most part; please consult the schedule or D2L for current information

Prerequisite/Co-Requisite:
MDSC 205 and admission to the BHSc Honours program

An introduction to the questions, methods, research techniques uses and ethics arising across the different majors of Biomedical Sciences, Bioinformatics and Health and Society. Sessions will support the development of a broad perspective on health issues. A component of the course will also introduce students to principal theories and methods in research ethics.

In the context of significant current health issues and to gain a deeper appreciation of the breadth of research perspectives, MDSC 308 will introduce students to the scientific disciplines represented by the three majors of the Bachelor of Health Sciences program. The course will explore each major's approach to generating research questions and the methodologies used to address them. Students will also be introduced to the norms and Canadian rules related to the ethical conduct of research.

Global Objectives
- To provide an understanding of the primary discipline specific topics, approaches and tools for each stream;
- To introduce current health issues and use these as a context example of the applications for all three streams; and
- To introduce basic concepts in scientific integrity and the ethics of research on humans

Course Learning Outcomes

Biomedical Sciences
By the end of this course, students will be able to:
1. Understand the role vaccines play in public health.
2. Understand how vaccines are made, how they confer immunity and hurdles in their development.
3. Identify preventable causes of cancer.
4. Know the principles underlying cancer causation.
5. Evaluate primary literature to assess the evidence supporting classification of carcinogens.

Bioinformatics
By the end of this course, students will be able to:

1. Understand the central role that bioinformatics and computational biology plays in modern biomedical research.
2. Describe the relationship between personalized medicine, genomics, and computational biology.
3. Understand how computational prediction can guide experimental biology and vice versa.
4. Describe the fundamental evolutionary processes that generate and maintain genetic variation in natural populations.
5. Understand the role of natural selection in the biology of cancer.

Health and Society

By the end of this course, students will be able to:

1. Use various definitions of human health and disease to appraise and evaluate health interventions
2. Use appropriate socioecological models and core principles of population health and inequities to appraise, evaluate and propose health interventions
3. Discuss positionality, intersectionality, interdisciplinarity and these concepts' relevance in a scientific research enterprise context, including public health.
4. Evaluate when the quantitative, qualitative, or mixed methods research paradigms are more appropriate for investigating a particular research question or assessing an intervention
5. Use systematic literature search techniques on a health inequity issue of interest and apply the appropriate aforementioned principles to evidence and propose a new research agenda.

Research Ethics

By the end of this course, students will be able to:

1. Know the significance of key ethical concepts regarding research ethics;
2. Describe the difference between scientific integrity and clinical research ethics;
3. Apply existing rules to case examples concerning scientific integrity; and
4. Make a well-written and convincing argument regarding research ethics in an actual historical research study.

Transferable Skill Development:

Many of the skills and abilities that students are developing in their 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 student success in building future careers.

The work that students do in MDSC 308 will help 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, by being curious and 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 to 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 perform 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.

Readings

Course instructors will provide a list of required readings and viewings that will be outlined on D2L, and links and documents, where possible. Required readings and viewings have been chosen carefully to inform you and enhance the lecture material**. Students are REQUIRED to complete assigned readings BEFORE each lecture. The instructor will stipulate whether the viewing is to occur before or during the class.** Instructors will proceed in class on the assumption 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 read the assignment material several times.

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.

Evaluation

The University policy on grading and related matters is described in section F of the 2021-2022 Calendar. In determining the overall grade in the course, the following weights will be used:

15% Biomedical Sciences

- 7.5% Fall Term Assignment
  paper exploring challenges in vaccine development
- 7.5% Winter Term Assignment
  details to be provided in the Winter term

15% Bioinformatics

- 3.75 % Computer lab 1 (Fall term)
  Lab assignments will be due 1 week from the laboratory date
- 3.75 % Computer lab 2 (Fall term)
  Lab assignments will be due 1 week from the laboratory date
- 3.75 % Computer lab 3 (Winter term)
  Lab assignments will be due 1 week from the laboratory date
- 3.75 % Computer lab 4 (Winter term)
  Lab assignments will be due 1 week from the laboratory date

Group assignments and laboratory submission instructions will be provided at the beginning of the fall unit on September 23.

15% Health and Society

- 6.5 % Fall Term Assignment
  Paper exploring social determinants of health and health promotion strategies

- 6.5 % Winter Term Assignment
  Research agenda policy brief

- 2 % Participation
  In-class exercises

10% Interdisciplinary Assignment #1

Health Promotion Poster
Due October 31, 2022 (by NOON via D2L Dropbox)
Presentations November 1 & 3, 2022

20% Interdisciplinary Assignment #2

Presentations April 4, 6 & 11, 2023
Group Paper Due April 14, 2023 (by NOON via D2L Dropbox)

25% Introduction to Research Ethics

12.5% Scientific Integrity
Exam, December 6, 2022, 12:15pm

12.5% Clinical Research Ethics
Paper due Monday, January 30, 2022 (by NOON via D2L dropbox)

Each instructor will provide guidelines for the submission of individual assignments.

**There will be no Registrar-scheduled December or April exams for this course although you might be required to submit papers during these periods.

Students are required to complete all individual and group assignments of the course. Students who do not complete and submit all major individual components, which includes the two biomedical papers, two health and society papers, ethics exam and ethics paper and the bioinformatics assignments, in addition to contributing actively to the group assignments (both written products produced and presentations) will be considered as not having completed the course; this outcome will be reflected on the student's official transcript as a failing (F) grade.

Students who do not achieve an average score of 65% on the Fall term BMED and HSOC papers and the ethics paper will be expected to participate in additional writing support initiatives to prepare them for subsequent assignments and future courses.

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:
Late assignments will not be accepted and will automatically receive a mark of zero. There will be NO exceptions to this policy.

Faculty members who are involved in MDSC 308 are agreed that **extensions will NOT be granted** on any assignment or quizzes. The only exceptions to this policy are those consistent with the University Calendar (debilitating illness, religious conviction, or severe domestic affliction), evidence of which must be received in writing. To qualify for an exception, the student must provide supporting documentation to the instructor.

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 process and content of the course at any time with the instructor. Students may also address any concerns they may have with Dr. Ebba Kurz, Associate Dean (Undergraduate Health and Science Education) in the Cumming School of Medicine (kurz@ucalgary.ca).

Attendance
it is important that you make every effort to attend all sessions, but especially those involving group presentations. We request that you notify the instructor responsible for a given session directly via email for any extended absences.

Conduct During Lectures
The classroom should be respected as a safe place 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/legal-services/university-policies-procedures.

Students are expected to take notes during class and should not rely solely on material supplied by the instructors.

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/policies/files/policies/electronic-communications-policy.pdf .

UNIVERSITY OF CALGARY POLICIES AND SUPPORTS

Copyright
All students are required to reach the University of Calgary policy on Acceptable Use of Material Protected by Copyright (https://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf) 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/pubs/calendar/current/k.html.

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/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf). SAS will process the request and issue letters of accommodations to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/ .

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. Ebba Kurz (kurz@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. **Academic misconduct 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://ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf
https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf

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 may proceed with an academic appeal, according to 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/ombuds) for assistance with this process 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 only **within 10 business days** of first being notified of the grade. https://www.ucalgary.ca/pubs/calendar/current/i-2.html

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. This policy 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/policies/files/policies/sexual-violence-policy.pdf

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)
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 student 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 student 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, please 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 promptly 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, please see https://www.ucalgary.ca/emergencyplan/building-evacuation/assembly-points

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.