

MDSC 415
Introduction to Epidemiology

Course Coordinator and Instructor:

Fabiola Aparicio-Ting, MPH PhD
Senior Instructor, Community Health Sciences
Cumming School of Medicine
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Office Hours/Policy on Answering Student Emails

Please book appointments by email. Email communications with the instructor and the TA are welcome. All efforts will be made to respond to emails within 48 hours. Substantive issues are to be addressed in person, either in class or during an appointment.

Teaching Assistant:

Apisha Sri
MSc student, Epidemiology
Community Health Sciences, Cumming School of Medicine
apishanthi.sriskanda@ucalgary.ca

Time and Location:

Tuesdays & Thursdays 3:30pm – 4:45pm
1405B, Health Science Centre
Foothill Campus

Please consult course schedule to confirm location of individual sessions.

Prerequisites:

Enrolment in the Bachelor of Health Science program and MDSC 308 or consent from the course instructor.

Course Description:

An introduction to the basic concepts of epidemiology needed to understand and critically analyze research pertaining to health and disease in populations. Methods used in descriptive and analytic epidemiological studies, including the design, analysis and interpretation of results for observational studies and clinical trials will be discussed. Case studies and contemporary events will be used to illustrate epidemiology in action and to highlight the social aspects of applying epidemiology in public health.

Overarching Theme

Students will be introduced to the basic principles of epidemiological research and examples of sub-disciplines within Epidemiology, which may include Social Epidemiology, Infectious Disease Epidemiology, Cancer Epidemiology and Genetic Epidemiology. This course has been designed to

provide students with opportunities to build epidemiological and research literacy and to practice and refine skill sets, including: written responses and critical analysis of published research.

Global Objective

To foster excitement and interest in epidemiology in an interactive classroom environment that is positive, engaging and intellectually challenging.

Learning Objectives

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

1. Illustrate the interplay between epidemiology and population and public health using examples.
2. Define and correctly use epidemiological terms and vocabulary.
3. Discuss disease causation, statistical associations and causal inference.
4. Calculate and interpret measures of disease frequency and cite their strengths and limitations.
5. Identify sources of bias and confounding in epidemiological research.
6. Discuss the design and methodology of each of the observational study designs and identify the strengths and limitations of each.
7. Identify, estimate and interpret the appropriate measures of association for each of the observational study types.
8. Critically analyze health research, particularly observational research on human 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 415 will help you build the following transferable skills:

- **Verbal Communication:** Learn and share information by presenting, listening, and interacting with others, while using technical language appropriately.
- **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.
- **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.

Learning Resources

Gordis, L. Epidemiology, 6th Edition. (2018). Philadelphia: Elsevier Saunders.

This required textbook is available for purchase from the University of Calgary Medical Bookstore. There is also a digital version that is appropriate for this course.

The list of required reading, including links to sources beyond the textbook, will be posted on D2L.

Recommended Textbooks/Readings

A Dictionary of Epidemiology, 4th Edition. (2001). Last JM (editor). New York, NY; Oxford University Press.

A Note regarding readings

A list of required readings will be outlined on D2L and links and documents will be made available, where possible. 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 on the assumption that students have read completely the assigned readings. 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 are regularly checking your @ucalgary.ca account.

Evaluation

The University policy on grading and related matters is described in section F of the 2022-2023 Calendar.

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

Evaluation Activity	Percentage of Grade	Due Date	Learning Objectives Addressed
Critical analysis assignment #1	15%	February 14, 2023	#1, #2, #4
Critical analysis assignment #2	20%	March 28, 2023	#2, #5, #6, #7, #9
Critical analysis assignment #3	20%	April 11, 2023	#2, #3, #5, #7, #8, #9
Class participation	10%	Ongoing	all
Final exam	35%	Scheduled by the Registrar	all

Registrar-Scheduled Final Examination:

The final examination will be cumulative and closed-book and will contain both multiple choice and short answer questions. Only a non-programmable calculator will be allowed. Consult Section G of the University of Calgary Calendar for rules governing final examinations.

A student's final grade for the course is the sum of the separate assignments. It is not necessary to pass each assignment separately in order to pass the course.

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 2022-23 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
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 will receive 20% grade penalty within 24 hours of the deadline, after which assignments will not be accepted and will receive a mark of zero.

Extensions will NOT be granted on any assignment in MDSC 415. 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, 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://www.ucalgary.ca/pubs/calendar/current/e-4.html>).

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 since much of the learning in this course will be gained through in-class discussions. Marks for participation cannot be gained unless you are in attendance. Please notify the instructor 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. **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://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 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/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://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. 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/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-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 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 suypaca@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/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.

Class Schedule:

The weekly schedule of topics and required readings is posted on D2L. The course schedule provided is provisional, with the exception of assignment due dates. Circumstances could give rise to scheduling changes. Please check D2L for updates.

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Course Schedule with Required Readings

The following schedule is provisional. Circumstances could give rise to scheduling changes. You will be notified at least one week in advance if the required reading for a particular session has changed.

Date & Room	Topic	Required Readings*/Assignments
January 10, 2023 <i>HS 1405B</i>	Course Overview	Course Outline - Posted on D2L
January 12, 2023 <i>HS 1405B</i>	Historical Overview & Basic Definitions	
January 17, 2023 <i>HS 1405B</i>	Infectious Disease Epidemiology Disease outbreaks I	Chapter 2 -The Dynamics of Disease Transmission
January 19, 2023 <i>HS 1405B</i>	Infectious Disease Epidemiology Disease outbreaks II Epidemiology of COVID-19 Dr. Bayan Missaghi, MD Infectious Disease Consultant Clinical Assistant Professor of Medicine, University of Calgary Medical Lead, Infection Prevention & Control, Peter Lougheed Centre	Chapter 2 -The Dynamics of Disease Transmission
January 24 2023 <i>HS 1405B</i>	Infectious Disease Epidemiology Disease outbreaks III	Chapter 2 -The Dynamics of Disease Transmission
January 26, 2023 <i>HS 1405B</i>	<i>Dr. Vineet Saini PhD DVM</i> Measures of disease frequency: Prevalence and incidence	Chapter 3 –Occurrence of Disease: I. Disease Surveillance and Measures of Morbidity
January 31, 2023 <i>HS 1405B</i>	<i>Dr. Vineet Saini PhD DVM</i> Indices of Mortality & Disease and Population Health Surveillance	Chapter 4 - Occurrence of Disease: II. Mortality and Other Measures of Disease Impact

Date & Room	Topic	Required Readings*/Assignments
February 2, 2023 <i>HS 1405B</i>	Causal Thinking: Causal inference; causation versus association; weighing the evidence	Chapter 14 – From Association to Causation: Deriving Inferences from Epidemiologic Studies
February 7, 2023 <i>HS 1405B</i>	Frameworks for reading/analyzing published research	Blettner, M., Heuer, C., & Razum, O. (2001). Critical reading of epidemiological papers: A guide. <i>Eur J Public Health, 11</i> (1), 978-101. Posted on D2L Messerli, F.H. (2012). Chocolate consumption, cognitive function, and Nobel Laureates. <i>N Engl J Med, 367</i> (16), 1562-1564. Posted on D2L
February 9, 2023 <i>HS 1405B</i>	Pause for Review – Prevalence and Incidence	
February 14, 2023 <i>HS 1405B</i>	Introduction to study design - Experimental studies: Clinical trials & intervention studies	Chapter 7 – Assessing the Efficacy of Preventive and Therapeutic Measures: Randomized Trials Assignment 1 due
February 16, 2023	Observational study designs: Cohort studies - Part 1 Study design and Relative Risks	Chapter 8 – Cohort Studies
February 21, 2023	No Lecture – Reading Week	
February 23, 2023	No Lecture – Reading Week	
February 28, 2023 <i>HS 1405B</i>	Observational study designs: Cohort studies - Part 2 Bias in cohort studies	Chapter 12: Estimating Risk: Is There An Association? Pages 215-220 (end of Relative Risk section)
March 2, 2023 <i>HS 1405B</i>	Observational study designs: Case-control studies –Part 1 Study design and Odds Ratios	Chapter 9 – Comparing Cohort and Case-control Studies Pages 189-192 (to the end of Design of a Case Control Study section) Chapter 12: Estimating Risk: Is There An Association? Pages 220-228
March 7, 2023 <i>HS 1405B</i>	Observational study designs: Case-control studies –Part 2	Chapter 9 – Comparing Cohort and Case-control Studies

Date & Room	Topic	Required Readings*/Assignments
	Bias in case-control studies	Pages 192-206
March 9, 2023 <i>HS 1405B</i>	Pause for Review: Bias in cohort and case-control studies	Chapter 13: A Pause for Review: Comparing Cohort and Case-Control Studies.
March 14, 2023 <i>HS 1405B</i>	Cross sectional & Ecological studies	Chapter 10 – Case-control Studies and Other Study Designs Pages 208 -214 (start at Ecological Studies)
March 16, 2023	No Lecture	
March 21, 2023	Confounding & Effect Modification	Chapter 15 – More on Causal Inferences: Bias, Confounding, and Interaction
March 23, 2023 <i>HS 1405B</i>	Pause for Review: Comparing study designs Confounding and Effect modification	
March 28, 2023 <i>HS 1405B</i>	Focus on prevention: Measuring attributable risk	Chapter 13: More on Risk: Estimating the Potential for Prevention Assignment 2 due
March 30, 2023 <i>HS 1405B</i>	Epidemiology in Injury Research Dr. Brent Hagel, PhD Professor Departments of Pediatrics and Community Health Sciences, Cumming School of Medicine TBD	
April 4, 2023 <i>HS 1405B</i>	Summarizing the evidence: Systematic reviews & meta-analysis Dr. Paul Ronksley, PhD Associate Professor	Ronksley, P. E., Brien, S. E., Turner, B. J., Mukamal, K. J., & Ghali, W. A. (2011). Association of alcohol consumption with selected cardiovascular disease outcomes: a systematic review and meta-analysis. <i>BMJ</i> , 342, d671. Posted on D2L

Date & Room	Topic	Required Readings*/Assignments
	Community Health Sciences, Cumming School of Medicine TBD	
April 6, 2023 <i>HS 1405B</i>	Molecular Epidemiology Dr. Dylan O’Sullivan Postdoctoral Fellow Department of Oncology, Cumming School of Medicine TBD	
April 11, 2023 <i>HS 1405B</i>	Course evaluations and wrap-up	Assignment 3 due

*Chapter readings refer to the course textbook: Gordis, L. *Epidemiology, 6th Edition*. (2018). Philadelphia: Elsevier Saunders.
Available for purchase from the University of Calgary Medical Bookstore.

**Registrar-Scheduled Final Exam:
TBA**