

## **MDSC 415**

### **Introduction to Epidemiology**

#### **Instructor:**

Fabiola Aparicio-Ting, MPH PhD  
Community Health Sciences  
Cumming School of Medicine  
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#### **Teaching Assistant (TA):**

Kaylee Ramage  
PhD Candidate, Epidemiology  
Community Health Sciences, Cumming School of Medicine  
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#### **Time & Location:**

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

#### **Office Hours:**

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.

#### **Prerequisites:**

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

#### **Course Description**

This course will introduce students to the basic concepts of epidemiology needed to understand and critically analyze research pertaining to health and disease in populations and to develop health research literacy. 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. Students will also be introduced to 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 practice and refine skill sets, including: written responses and critical analysis of published research.

## Course Goals

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 should 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, interpret and explain measures of disease frequency and cite their strengths and limitations.
5. Identify sources of bias and confounding in epidemiological research.
6. Compare the strengths and limitations of the observational study designs used in epidemiological research.
7. Discuss the design and methodology of each of the observational study designs.
8. Identify, estimate and interpret the appropriate measures of association for each of the observational study types.
9. Critically analyze health research, particularly observational research on human populations.

## Required Course Materials

1. Gordis, L. *Epidemiology, 5th Edition*. (2013). Philadelphia: Elsevier Saunders.  
This book is available for purchase from the University of Calgary Medical Bookstore.
2. Your set of **class notes**. Any content presented in class, whether verbally or in written form, could be used for assessment purposes. Class discussion is understood to constitute content. While students are ultimately responsible for creating their own set of class notes, some materials will be available to download from the Desire2Learn (D2L) course website.

## Recommended Resources

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

Elwood, M. E. *Critical Appraisal of Epidemiological Studies and Clinical Trials, 3<sup>rd</sup> Edition*. (2007). New York, NY; Oxford University Press.

## Required Readings

Required readings will be listed on the course schedule posted on Desire2Learn (D2L). Required readings have been chosen carefully to inform you and enhance the lecture material. **Students are REQUIRED to complete assigned readings BEFORE each lecture.** Many sessions will be centred on discussions of published research articles assigned as readings. Discussions in class will be conducted with the assumption that the assigned readings have been completed.

## Evaluation

The University policy on grading and related matters is described in section F.2 of the 2018-2019 Calendar.

In determining the overall grade in the course the following weights will be used: Detailed instructions for all assignments will be provided in class.

Evaluation Activity	Percentage of Grade	Due Date	Learning Objectives Addressed
Critical analysis assignment #1	15%	February 14, 2019	#1, #2, #4
Critical analysis assignment #2	20%	March 19, 2019	#2, #5, #6, #7, #9
Critical analysis assignment #3	20%	April 9, 2019	#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.

### Grading Scheme:

Letter Grade	Description	Percentage
A+	Outstanding performance	97-100
A	Excellent performance	90-96
A-	Approaching excellent performance	85-89
B+	Exceeding good performance	80-84
B	Good performance	75-79

<b>B-</b>	Approaching good performance	70-74
<b>C+</b>	Exceeding satisfactory performance	65-69
<b>C</b>	Satisfactory performance	60-64
<b>C-</b>	Approaching satisfactory performance	57-59
<b>D+</b>	Marginal pass	54-56
<b>D</b>	Minimal pass	50-53
<b>F</b>	Did not meet course requirements	0-49

## A Note regarding Academic Writing

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 2018-19 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). The University of Calgary offers a number of 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.

## Late or Missed Components of Term Work

**Late assignments will not be accepted and will automatically receive a mark of zero.** The only exceptions to this policy are those in keeping with the *University of Calgary Calendar* (illness, religious conviction, or domestic affliction) which are received in writing and with supporting documentation. Traffic jams and late or full busses are common events in Calgary and are NOT acceptable reasons for late arrivals to classes, meetings and examinations. Plan for transportation delays.

**Extensions will not be granted on any assignment or presentations.** The only exceptions to this are those in keeping with the University Calendar (illness, religious conviction, or domestic affliction) that are received in writing and with supporting documentation. Please be advised that students should notify the instructor before the assignment deadline or presentation date, whenever possible, to discuss. 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>).

## Brightspace by Desire2Learn (D2L)

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.

If you need help accessing or using D2L, please visit the Desire2Learn resource page for students: <http://elearn.ucalgary.ca/d2l-student/>.

## **Policies Governing the Course**

### **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**

This course will involve class discussions and sharing of ideas and personal views. 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 conduct themselves in a mature and courteous manner during ALL sessions. Students are expected to frame their comments and questions to the instructor and to peers in respectful and appropriate language, always maintaining sensitivity towards the topic.

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

### **Electronic Devices**

The Bachelor of Health Sciences program aims to create a supportive and respectful learning environment for all students. Research studies have found that student use of electronic devices (laptops, tablets, etc) in the classroom negatively affects the learning of both the user and those sitting nearby. Inappropriate use of laptops is also disruptive to your fellow classmates and disrespectful to the lecturer. The use of laptops and other electronic note-taking devices is permitted; however, their use in the classroom should be for course-related work/note-taking only. Please do NOT surf the web, check email or do other unrelated work. Students who use their laptops inappropriately or are otherwise disruptive during lectures will be asked to leave.

Cell phones (or similar devices) should be turned off (not merely silent) upon entering the classroom. Sending/receiving text messages or leaving the class to take calls is disruptive to the entire class and will not be tolerated unless absolutely necessary. Students who disregard this rule during lectures or tutorials will be asked to leave. These items are not permitted under any circumstance during the final exam.

### **Copyright**

It is the responsibility of students and professors to ensure that materials they post or distribute to others comply with the Copyright Act and the University's Fair Dealing Guidance

for Students ([library.ucalgary.ca/files/library/guidance\\_for\\_students.pdf](http://library.ucalgary.ca/files/library/guidance_for_students.pdf)). Further information for students is available on the Copyright Office web page (<http://library.ucalgary.ca/copyright>)

### **A Note Regarding Instructor Intellectual Property**

Generally speaking, course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor(s). 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 Based on Disability or Medical Condition**

It is the student's responsibility to register with Student Accessibility Services to be eligible for formal academic accommodation 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\\_0.pdf](https://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf)). If you are a student who may require academic accommodation and have not registered with Student Accessibility Services, please contact their office at (403) 220-8237; <http://www.ucalgary.ca/access/>. Students will be provided with all necessary accommodations to ensure equal opportunity to succeed in this course. Please provide the instructor your accommodation letter from Student Accessibility Services within 14 days after the start of this course so that all needed arrangements for exams and assignments can be made.

### **Academic Accommodations on Protected Grounds other than Disability**

Students who require an accommodation in relation to their coursework based on a protected ground other than disability, should communicate this need, preferably in writing, to the designated BHSc program contact, Mrs. Jennifer Logan ([jllogan@ucalgary](mailto:jllogan@ucalgary)), or to Dr. Ebba Kurz, Associate Dean, Undergraduate Health and Science Education, Cumming School of Medicine. Students who require an accommodation unrelated to their coursework or the requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience). For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://www.ucalgary.ca/access/).

### **Academic Misconduct**

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. These rules are contained principally in Sections J to L of the University of Calgary Calendar. This document also stipulates the penalties for violating these rules. Please know that the University and the Cumming School of Medicine take these rules seriously. **All incidences of academic dishonesty in this course, such as cheating and plagiarism, will be reported to the Associate Dean, Undergraduate Health & Science Education, for investigation;** infractions will be noted on the record of a student found to be guilty.

## **Recording of Lectures**

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

## **Other Important Information**

### **Freedom of Information and Protection of Privacy Act**

This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP); students should identify themselves on written assignments (exams and term work) by their name and ID number on the front page and ID on each subsequent page. Work assigned to you by your course instructor will remain confidential unless otherwise stated before submission. The assignment cannot be returned to anyone else without your expressed permission to the instructor. Grades will be made available on an individual basis and students will not have access to other students' grades without expressed consent. Similarly, any information about yourself that you share with your course instructor will not be given to anyone else without your permission. See <http://www.ucalgary.ca/policies/files/policies/privacy-policy-2011.pdf> for more information.

### **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 15 days of first being notified of the grade.

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

Student Success Centre	<a href="http://www.ucalgary.ca/ssc/">http://www.ucalgary.ca/ssc/</a>
Student Wellness Centre	<a href="http://www.ucalgary.ca/wellnesscentre/">http://www.ucalgary.ca/wellnesscentre/</a>
Distress Centre	<a href="http://www.distresscentre.com/">http://www.distresscentre.com/</a>
Library Resources	<a href="http://library.ucalgary.ca">http://library.ucalgary.ca</a>

### **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 (Room 370 MacEwan Student 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/](http://www.ucalgary.ca/ombuds/) or email [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca)

**Student Union (SU) Information**

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

**Emergency Evacuation/Assembly Points**

Assembly points for emergencies have been identified across campus. Assembly points are designed to establish a location for information updates from the emergency responders to the evacuees; and from the evacuated population to the emergency responders. The primary assembly point for the Health Sciences Centre is the Health Research Innovation Centre (HRIC) Atrium. For more information, see the University of Calgary's Emergency Management website: <http://www.ucalgary.ca/emergencyplan/assemblypoints>

**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.

**Course Schedule & Required Readings**

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.

## MDSC 415: Introduction to Epidemiology 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.

<b>Date &amp; Room</b>	<b>Topic</b>	<b>Required Readings*/Assignments</b>
January 10, 2019 <i>1405B, HSC</i>	Course Overview	Course Outline <b>Posted on D2L</b>
January 15, 2019 <i>1405B, HSC</i>	Historical Overview & Basic Definitions	
January 17, 2019 <i>1405B, HSC</i>	Infectious Disease Epidemiology Disease outbreaks I	Reingold, A. (2000). Outbreak Investigation - A perspective. <i>Epidemiological Bulletin</i> , 21(2), 1-7. <a href="http://www1.paho.org/english/sha/be_v21n2-outbreak.htm">http://www1.paho.org/english/sha/be_v21n2-outbreak.htm</a> <b>Posted on D2L</b>  Chapter 2 -The Dynamics of Disease Transmission
January 22, 2019 <i>1405B, HSC</i>	Infectious Disease Epidemiology Disease outbreaks II	Chapter 2 -The Dynamics of Disease Transmission
January 24 2019 <i>1405B, HSC</i>	Infectious Disease Epidemiology Disease outbreaks III	Chapter 2 -The Dynamics of Disease Transmission
January 29, 2019 <i>1405B, HSC</i>	Measures of disease frequency: Prevalence and incidence	Chapter 3 –Occurrence of Disease: I. Disease Surveillance and Measures of Morbidity
January 31, 2019 <i>1405B, HSC</i>	Indices of Mortality & Disease and Population Health Surveillance	Chapter 4 - Occurrence of Disease: II. Mortality and Other Measures of Disease Impact  Chan, W., Ng, C., & Young, T. K. (2013). How we identify and count Aboriginal people—does it make a difference in estimating their disease burden? <i>Chronic Dis Inj Can</i> , 33(4), 277-280. <b>Posted on D2L</b>

<b>Date &amp; Room</b>	<b>Topic</b>	<b>Required Readings*/Assignments</b>
February 5, 2019 1405B, HSC	Causal Thinking: Causal inference; causation versus association; weighing the evidence	Chapter 14 – From Association to Causation: Deriving Inferences from Epidemiologic Studies
February 7, 2019 1405B, HSC	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. <b>Posted on D2L</b>  Messerli, F.H. (2012). Chocolate consumption, cognitive function, and Nobel Laureates. <i>N Engl J Med, 367</i> (16), 1562-1564. <b>Posted on D2L</b>
February 12, 2019 1405B, HSC	Introduction to study design - Experimental studies: Clinical trials & intervention studies	Chapter 7 – Assessing the Efficacy of Preventive and Therapeutic Measures: Randomized Trials
February 14, 2019 1405B, HSC	Observational study designs: Cohort studies - Part 1 Study design and Relative Risks	Chapter 9 – Cohort Studies  <b>Assignment 1 due</b>
February 19, 2019 1405B, HSC	<b>No Lecture – Reading Week</b>	
February 21, 2019	<b>No Lecture – Reading Week</b>	
February 26, 2019	Observational study designs: Cohort studies - Part 2 Bias in cohort studies	Chapter 11: Estimating Risk: Is There An Association? Pages 215-220 (end of Relative Risk section)
February 28, 2019 1405B, HSC	Observational study designs: Case-control studies –Part 1 Study design and Odds Ratios	Chapter 10 – Case-control Studies and Other Study Designs Pages 189-192 (to the end of Design of a Case Control Study section)  Chapter 11: Estimating Risk: Is There An Association? Pages 220-228

<b>Date &amp; Room</b>	<b>Topic</b>	<b>Required Readings*/Assignments</b>
March 5, 2019 1405B, HSC	Observational study designs: Case-control studies –Part 2 Bias in case-control studies	Chapter 10 – Case-control Studies and Other Study Designs Pages 192-206
March 7, 2019 1405B, HSC	Pause for Review: Bias in cohort and case-control studies	Chapter 13: A Pause for Review: Comparing Cohort and Case-Control Studies.  Boccia S., La Torre, G., Persiani, R., D'Ugo, D., van Duijn, C.M., & Ricciardi, G. (2007). A critical appraisal of epidemiological studies comes from basic knowledge: A reader's guide to assess potential for biases. <i>World Journal of Emergency Surgery</i> , 2(7), doi:10.1186/1749-7922-2-7. <b>Posted on D2L</b>
March 12, 2019 1405B, HSC	Cross sectional & Ecological studies  Comparing study designs	Chapter 10 – Case-control Studies and Other Study Designs Pages 208 -214 (start at Ecological Studies)
March 14, 2019 1405B, HSC	Confounding & Effect Modification	Chapter 15 – More on Causal Inferences: Bias, Confounding, and Interaction
March 19, 2019 1405B, HSC	Pause for Review: Confounding and Effect modification	<b>Assignment 2 due</b>
March 21, 2019 1405B, HSC	Focus on prevention: Measuring attributable risk	Chapter 12: More on Risk: Estimating the Potential for Prevention
March 26, 2019 1405B, HSC	Summarizing the evidence: Systematic reviews & meta-analysis	Manzoli, L., Villari, P., Pirone, G.M., & Boccia, (2007). A. Marital status and mortality in the elderly: A systematic review and meta-analysis, <i>Soc Sci Med</i> , 64(1), 77-94. <b>Posted on D2L</b>
March 28, 2019 1405B, HSC	Pause for review	
April 2, 2019 1405B, HSC	<b>Epidemiology in Injury Research</b>  Brent Hagel, PhD Professor	

Date & Room	Topic	Required Readings*/Assignments
	Departments of Paediatrics and Community Health Sciences Cumming School of Medicine	
April 4, 2019 1405B, HSC	<b>Molecular Epidemiology &amp; Genetic Epidemiology</b>  Darren R. Brenner, Ph.D. Assistant Professor Departments of Oncology and Community Health Sciences, Cumming School of Medicine, Armstrong Investigator in Molecular Epidemiology Alberta Health Services	
April 9, 2019 1405B, HSC	<b>Psychiatric Epidemiology</b>  Scott B. Patten, MD PhD Professor Departments of Psychiatry and Community Health Sciences Cumming School of Medicine	<b>Assignment 3 due</b>
April 11, 2019 1405B, HSC	USRI evaluations Wrap-up	

\*Chapter readings refer to the course textbook: Gordis, L. *Epidemiology, 5th Edition*. (2013). Philadelphia: Elsevier Saunders.  
 Available for purchase from the University of Calgary Medical Bookstore.

**Registrar-Scheduled Final Exam:  
 TBD**