



**CUMMING SCHOOL OF MEDICINE  
GRADUATE COURSE OUTLINE**

<b>COURSE TITLE:</b>			
<b>Course Name and Number</b>	MDCH 740, Advanced Epidemiology		
<b>Pre/Co-Requisites</b>	Community Health Sciences 640 or Medical Science 647.01 and admission to the Community Health Sciences graduate program or consent of the program. All students will have experience using one or more statistical data analysis packages		
<b>Faculty</b>	Cumming School of Medicine, Graduate Science Education		
<b>Instructor Name(s)</b>	Dr. Tanvir Turin Chowdhury Dr. Scott B Patten	<b>Email</b>	<a href="mailto:turin.chowdhury@ucalgary.ca">turin.chowdhury@ucalgary.ca</a> <a href="mailto:patten@ucalgary.ca">patten@ucalgary.ca</a>
<b>Office Location</b>	Office hours by appointment.	<b>Office Hours</b>	Office hours by appointment.
<b>Instructor Email Policy</b>	Provide 72 hours for reply regarding course related question.		
<b>Telephone No.</b>	Email preferred		
<b>TA Name</b>	Stephana Cherak	<b>Email</b>	
<b>Class Term, Days</b>			
<b>Class Times</b>	Lecture: Monday 09:00 – 11:50 Tutorial: Wednesday 09:00 – 11:00		
<b>Class Location</b>	Zoom class according to above schedule		

This course, which is synchronous, will take place online via Desire2Learn (D2L) and Zoom. There will be 13 synchronous Zoom sessions throughout the term (as described in the course timetable)

<b>COURSE INFORMATION/DESCRIPTION OF THE COURSE</b>
The course will expand the student's understanding of causality and threats to validity in epidemiologic research. The focus will be on the assessment and control of bias, including selection, information and confounding. The concept of effect modification (interaction) will be appraised. Stratified analysis will be considered as a tool for the assessment and control of confounding and effect modification and will be applied to a variety of study designs including case-control, and cohort studies. Teaching strategies include small group discussion and problem solving and student presentations.
<b>LEARNING RESOURCES/REQUIRED READING</b>
There is no single text that may meet the needs of all students given the diversity in individual learning styles. The main course textbook is: Szklo M, Nieto J. Epidemiology: Beyond the Basics (fourth edition). Jones & Bartlett Learning, USA
<b>COURSE OBJECTIVES/LEARNING OUTCOMES</b>
1) Given a research question, the student will apply principles of bias reduction to interpretation of epidemiologic research.



- 2) Given a research question, students will implement and interpret several important epidemiologic analytic approaches.
- 3) Students will extend their extant competencies in basic epidemiological concepts to analyses that involve design features of more complex studies, such as those involving unequal selection probabilities and clustering.
- 4) The student will expand their skills in critical appraisal of the epidemiologic literature through formulation of causal models and application of quantitative bias analysis.
- 5) Through addressing a research question, students will expand their knowledge of epidemiologic and biostatistical analysis approaches for real-world applications, including data management challenges.
- 6) Students will advance their skills in communicating results and interpretation of epidemiologic estimates through reporting of analyses and peer-review of others' work.
- 7) Students will develop a basic familiarity with the problems of prediction, and associated solutions

#### Communication:

Brightspace (By D2L) is located on the University of Calgary server and will be used extensively for course materials and communication with Students. A link to the zoom class will be provided on D2L. It is the student's responsibility to ensure that they receive all posted communications and documents and that they receive e-mails sent by instructors of fellow students through D2L. Only your @ucalgary.ca e-mail address may be linked to D2L. Please ensure that you are regularly checking your @ucalgary.ca account

#### Learning Technology Requirements

In order to successfully engage in learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security and malware updates;
- A current and updated web browser;
- Webcam (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Broadband internet connection

Most current laptops will have a built-in webcam, speaker and microphone.

Please see the following for a detailed explanation of the minimal required technology for online learning  
<https://elearn.ucalgary.ca/technology-requirements-for-students/>

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/>.

The students will need to have a STATA analytic software.

*The University of Calgary Cumming School of Medicine would like to acknowledge the traditional territories of the people of the Treaty 7 region in Southern Alberta, which includes the Blackfoot Confederacy (comprising the Siksika, Piikani, and Kainai First Nations), as well as the Tsuut'ina First Nation, and the Stoney Nakoda (including*



*the Chiniki, Bearspaw, and Wesley First Nations). The City of Calgary is also home to Métis Nation of Alberta, Region III.*

CUT POINTS FOR GRADES			
This course adheres to the grading system outlined in the University of Calgary, Faculty of Graduate Studies Calendar. Grades of A+ and A are not distinguished in the calculation of GPAs. Percentage/letter grade conversion used for this course is as follows			
Grade	Grade Point Value	Percentage Conversion	Graduate Description
A+	4.00	95-100	Outstanding
A	4.00	85-94	Excellent – superior performance showing comprehensive understanding of the subject matter
A-	3.70	80-84	Very Good Performance
B+	3.30	75-79	Good Performance
B	3.00	70-74	Satisfactory Performance
B-	2.70	65-69	Minimum Pass for Students in the Faculty of Graduate Studies
C+	2.30	55-64	All grades below 'B-' are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements
C	2.00	50-54	

<b>Assessment Components:</b> The University policy on grading related matters is outlined in the <a href="#">2020-2021 Calendar</a> .			
Assessment Methods	Description	Weight %	Due Date <u>and</u> Time
Eight written assignment		10 X 8	Provided in the class schedule
One oral presentation		10	Provided in the class schedule
Classroom engagement		10	Will be based on attendance and class activity participation

ASSESSMENT AND EVALUATION INFORMATION
<b>ATTENDANCE AND PARTICIPATION EXPECTATIONS:</b>  There will be 10% marking based on attendance and class engagement.



### **GUIDELINES FOR SUBMITTING ASSIGNMENTS:**

Assignments are due on the specified date by 9 AM. Students who hand in assignments late will be penalized 5% per day for handing in late. Assignments that are handed in 14 calendar days or more after the due date will be refused and the students assigned a score of zero for the assignment.

### **FINAL EXAMINATIONS:**

There is no final examination.

### **EXPECTATIONS FOR WRITING:**

The Department of Community Health Sciences expects intellectual honesty from its students. Course participants should be aware of University policies relating to Principles of Conduct, Plagiarism and Academic Integrity. These are found online in the Faculty of Graduate Studies Calendar:

<https://www.ucalgary.ca/pubs/calendar/grad/current/gs-academic-regulations.htm>

### **LATE AND/OR MISSING ASSIGNMENTS:**

Students may hand in assignments late without penalty under the following circumstances:

- o The student has discussed the timelines with course instructor in advance of the due date and the course instructor has granted an extension
- o There is a valid health or family emergency such as is discussed under the University regulations for deferral of final examinations. Students may be required to provide the Course Coordinator with such documentation related to illness and/or emergency as is discussed and required in the University regulations pertaining to deferral of final examinations. This information can be found in the University Calendar.

### **Is a passing grade on a particular component essential to pass the course as a whole?**

Students must receive a passing grade on all the components.

Course Schedule Date	CLASS SCHEDULE		
	Topic, Activities & Readings	Instructor	Assignments/Due Dates & Times
Lecture 1: Jan 11th	Introduction / Evaluation Plan / Review	Dr.s Patten & Chowdhury	Assignment 1: Identify a health outcome of interest, confirm the feasibility of making a prevalence estimate.
Lecture 2: January 18	Cross-sectional Studies	Dr.s Patten & Chowdhury	<b>Assignment 1 due by 9 am on January 18<sup>th</sup> (10% of final grade)</b>  Discussion of project ideas

			Assignment 2: Produce an unweighted, weighted and replicate bootstrap weighted estimate of your selected health outcome variable.
Lecture 3: January 25	Calculating fitted values from models.	Dr.s Patten & Chowdhury	<p><b>Assignment 2 is due by 9 am on January 25. (10% of final grade)</b></p> <p>Assignment 3: Produce graphics showing estimated prevalence, as a function of categorical and continuous variables (e.g. age and sex).</p>
Lecture 4: February 1	Bootstrapped parameter estimates from complex surveys	Dr.s Patten & Chowdhury	<p><b>Assignment 3 is due by 9 am on February 1: (10% of grade).</b></p> <p>Assignment 4: Assessment of effect (measure) modification &amp; confounding</p>
Lecture 5: February 8	Concepts and models of causality: Drawing DAGS	Dr.s Patten & Chowdhury	<p><b>Assignment 4 is due by 9 am on February 9: (10% of grade).</b></p> <p>Assignment (5) Create your own DAG</p>
Lecture 6: February 22	Etiologic study	Dr.s Patten & Chowdhury	<p><b>Assignment (5) Oral Presentation of the DAG in the class on February 22 (10% of grade).</b></p> <p>No assignment for next week</p>
Lecture 7: March 1	Prospective Cohort	Dr.s Patten & Chowdhury	<p><b>No assignment is due this week.</b></p> <p>Assignment 6: Survival analysis – all cause mortality</p>
Lecture 8: March 8	Competing causes in survival analysis  Risk set sampling	Dr.s Patten & Chowdhury	<p><b>Assignment 6 is due by 9 am on March 8: (10% of grade)</b></p> <p>Assignment 7: Comparing a risk set sampled OR to an HR and RR.</p>

Lecture 9: March 15	Propensity Adjustments	Dr.s Patten & Chowdhury	<b>Assignment 7 is due by 9 am on March 15: (10% of grade)</b>  Assignment 8: Propensity adjustment for control of confounding.
Lecture 10: March 22	Missing data <ul style="list-style-type: none"> <li>Listwise deletion</li> <li>Single imputation</li> <li>Multiple imputation</li> </ul>	Dr.s Patten & Chowdhury	<b>Assignment 8 is due by 9 am on March 22 (10% of the grade).</b>  Assignment 9: The project proposal
Lecture 11: March 29	Prediction <ul style="list-style-type: none"> <li>Bias-variance trade-off</li> <li>Statistical vs. machine learning</li> </ul> LASSO	Dr.s Patten & Chowdhury	Students work on Assignment 9
Lecture 12: April 5	Meta-analysis & addressing Type I error <ul style="list-style-type: none"> <li>Inverse variance weighting</li> <li>Fixed versus random effects</li> <li>Analysis plans</li> <li>Bonferroni Adjustments</li> <li>Benjamini-Hochberg procedure</li> </ul>	Dr.s Patten & Chowdhury	Students work on Assignment 9
Lecture 13: April 12	Class Discussion	Dr.s Patten & Chowdhury	<b>Assignment 9 is due by 9 am on April 12 (10% of the grade).</b>



*Please create a detailed schedule for your course and customize this table if need be.*

### **Guidelines for Zoom Sessions**

Zoom is a video conferencing program that will allow us to meet at specific times for a 'live' video conference, so that we can have the opportunity to meet each other virtually and discuss relevant course topics as a learning community.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

The use of video conferencing programs relies on participants to act ethically, honestly and with integrity; and in accordance with the principles of fairness, good faith, and respect (as the Code of Conduct). When entering Zoom or other video conferencing sessions, you play a role in helping create an effective, safe and respectful learning environment. Please be mindful of how your behaviour in these sessions may affect others. Participants are required to use names officially associated with their UCID (legal or preferred names listed in the Student Centre) when engaging in these activities. Instructors/moderators can remove those whose names do not appear on class rosters. Non-compliance may be investigated under relevant University of Calgary conduct policies. If participants have difficulties complying with this requirement, they should email the instructor of the class explaining why, so the instructor may consider whether to grant an exception, and on what terms. For more information on how to get the most out of your zoom sessions visit: <https://elearn.ucalgary.ca/guidelines-for-zoom/>.

If you are unable to attend a Zoom session, please contact your instructor to arrange an alternative activity (where available). Please be prepared, as best as you are able, to join class in a quiet space that will allow you to be fully present and engaged in Zoom sessions. Students will be advised by their instructor when they are expected to turn on their webcam (such as for group work, presentations, etc).

The instructor may record online Zoom class sessions for the purposes of supporting student learning in this class – such as making the recording available for review of the session or for students who miss a session. Students will be advised before the instructor initiates a recording of a Zoom session. These recordings will be used to support student learning only.

### **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/policies/forms/title>.

### **Equity, Diversity and Inclusion**

The Cumming School of Medicine recognizes that equity, diversity, and inclusion benefits and strengthens all communities, including the medical community and those served by it. We aim to actively engage all learners, particularly those from equity seeking groups including women, Indigenous peoples, visible/racialized minorities, persons with disabilities, and LGBTQ+. While our faculty continues to learn about more equitable, diverse, and inclusive approaches to education, we welcome and appreciate suggestions to help us ensure that all learners are well served by our courses.

To help cultivate learning environments that support diverse and inclusive perspectives and lived experiences, learners are invited to let instructors know if:

- they have names and/or pronouns they would prefer to use that differ from those that appear on official records
- scheduled class meetings conflict with religious events so that alternative arrangements can be made

If they are not already, learners are also encouraged to become familiar with the various opportunities for diverse engagement, learning, and support on campus, including, but not limited to the following resources:

#### **The Office of Equity, Diversity and Inclusion**

<https://www.ucalgary.ca/equity-diversity-inclusion>

#### **The Q Centre**

<https://www.su.ucalgary.ca/programs-services/student-services/the-q-centre/>

#### **The Writing Symbols Lodge**

<https://www.ucalgary.ca/student-services/writing-symbols/home>

### **INTERNET AND ELECTRONIC COMMUNICATION DEVICE INFORMATION**

Cell phones must be turned off in class unless otherwise arranged with the instructor.

The use of laptop and mobile devices is acceptable when used in a manner appropriate to the course and classroom activities. Students are to refrain from accessing websites that may be distracting for fellow learners (e.g. personal emails, Facebook, YouTube). 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/acceptable-use-of-electronic-resources-and-information-policy.pdf>



## MEDIA AND RECORDING IN LEARNING ENVIRONMENTS

### **Media recording for lesson capture**

Please refer to the following statement on media recording of students: [https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP\\_FINAL.pdf](https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP_FINAL.pdf)

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

### **Media recording for assessment of student learning**

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

### **Media recording for self-assessment of teaching practices**

The instructor may use media recordings as a tool for self-assessment of their teaching practices. Although the recording device will be fixed on the instructor, it is possible that student participation in the course may be inadvertently captured. These recordings will be used for instructor self-assessment only and will not be used for any other purpose.

### **Student Recording of Lectures**

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

## UNIVERSITY OF CALGARY POLICIES AND SUPPORTS

### **ACADEMIC ACCOMMODATIONS**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://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 their Instructor. The full policy on Student Accommodations is available at [www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf](http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf)

### **IMPORTANT INFORMATION**

Any research in which students are invited to participate will be explained in class and approved by the appropriate University Research Ethics Board



### **INSTRUCTOR INTELLECTUAL PROPERTY**

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

### **COPYRIGHT LEGISLATION**

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright [www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf](http://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 unauthorised 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

### **ACADEMIC INTEGRITY**

The Cumming School of Medicine expects intellectual honesty from its students. Course participants should be aware of University policies relating to Principles of Conduct, Plagiarism and Academic Integrity. These are found in the printed Faculty of Graduate Studies Calendar, or online under Academic Regulations in the Faculty of Graduate Studies Calendar, available at [Faculty of Graduate Studies Academic Regulations](#)

### **ACADEMIC MISCONDUCT**

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at [www.ucalgary.ca/pubs/calendar/current/k.html](http://www.ucalgary.ca/pubs/calendar/current/k.html)

### **EMERGENCY EVACUATION AND ASSEMBLY POINTS**

Assembly points for emergencies have been identified across campus. The primary assembly points for South Campus (Health Science Centre (HSC); Health & Research Innovation Centre (HRIC); Heritage Medical Research Building (HMRB) and Teaching, Research and Wellness (TRW)) are:

- HSC and HMRB: HRIC Atrium (alternate assembly point is Parking Lot 6)
- HRIC: HMRB Atrium (alternate assembly point is Parking Lot 6)
- TRW: McCaig Tower (alternate assembly point is HMRB – Atrium)

### **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 N of the Faculty of Graduate Studies Calendar. Students must follow the official process and should contact the Student Ombuds Office ([www.ucalgary.ca/student-services/ombuds](http://www.ucalgary.ca/student-services/ombuds)) for assistance with this and with any other academic concerns, including academic and non-academic misconduct

### **THE FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY (FOIP) ACT**

This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP) and 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. Assignments given by you to 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

#### **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, at [www.ucalgary.ca/wellnesscentre/services/mental-health-services](http://www.ucalgary.ca/wellnesscentre/services/mental-health-services) and the Campus Mental Health Strategy website at [www.ucalgary.ca/mentalhealth/](http://www.ucalgary.ca/mentalhealth/)

#### **SUPPORTS FOR STUDENT LEARNING, SUCCESS, AND SAFETY**

**Student Ombudsman:** 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:** The SU Vice-President Academic can be reached at (403) 220-3911 or [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca); Information about the SU, including elected Faculty Representatives can be found here: [www.su.ucalgary.ca/](http://www.su.ucalgary.ca/)

**Graduate Student's Association:** The GSA Vice-President Academic can be reached at (403) 220- 5997 or [gsa.vpa@ucalgary.ca](mailto:gsa.vpa@ucalgary.ca); Information about the GSA can be found here: [gsa.ucalgary.ca](http://gsa.ucalgary.ca)

#### **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 [www.ucalgary.ca/security/safewalk](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.