



CUMMING SCHOOL OF MEDICINE  
GRADUATE COURSE OUTLINE  
Fall 2020

<b>COURSE TITLE:</b> Physiological and pharmacological aspects of therapeutic development			
<b>Course</b>	MDSC 674.01		
<b>Pre/Co-Requisites</b>	Must be registered in the Biomedical Technology graduate program. Consent of the course coordinator or Program Director is required for all other students. (Please see the University Calendar for more information).		
<b>Faculty</b>	Cumming School of Medicine, Graduate Science Education		
<b>Instructor Name(s)</b>	P. Hermann	<b>Email</b>	hermann@ucalgary.ca
<b>Office Location</b>	BI-446	<b>Office Hours</b>	Upon appointment
<b>Instructor Email Policy</b>			
<b>Telephone No.</b>	403 220-3573		
<b>TA Name</b>		<b>Email</b>	
<b>Class Term, Days</b>	Thu Sept 8, 2020 – Thu April 15, 2021		
<b>Class Times</b>	9:30-10:50 AM		
<b>Class Location</b>	Fall semester: online; Winter: TBD		

The first part (Fall semester) of this course will take place **online** via Desire2Learn (D2L) and Zoom via synchronous instruction. The instruction method for the second part (Winter semester) will be determined at a later time. To best succeed in the course, students are encouraged to participate in the synchronous Zoom sessions. When unable to participate live due to the time difference or unforeseen circumstances, inform the instructor in advance and propose and implement propose an alternative participation activity.

<b>COURSE INFORMATION/DESCRIPTION OF THE COURSE</b>
This course is required for students in the Masters in Biomedical Technology (MBT) graduate program. It is intended to provide a survey of core principles and technologies in Physiology and Pharmacology and includes the most recent advances, with an emphasis on fundamentals of drug/device development that includes the steps involved in the pre-clinical Research and Development process and highlighting how science and technology may be applied in the development of novel solutions to biomedical problems.
<b>LEARNING RESOURCES/REQUIRED READING</b>
none



### **COURSE OBJECTIVES/LEARNING OUTCOMES**

MDSC 674.01 is a full (two semesters) course that provides a basic background in cell physiology and pharmacology during the first (Fall) semester. During the second (Winter) semester of the course, a variety of lectures, mainly provided by guest lecturers/experts in the field, will cover various scientific aspects that are involved in the solutions for numerous clinical/medical issues including existing and potential therapies, drug design, devices, and diagnostics both in academia as well as within the Biotech industry. The objective of the course, with an emphasis on physiological, pharmacological, and cellular mechanisms in health and disease, is to provide students with the skills to interface between fundamental- and research in the biotechnology industry.

### **Communication**

Brightspace (By D2L) is located on the University of Calgary server and will be used extensively for 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 send by instructors of fellow students through D2L. Only your @ucalgary.ca e-mail address maybe 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/>.

### **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	

**Assessment Components:** The University policy on grading related matters is outlined in the [2019-2020 Calendar](#).

Assessment Methods	Description	Weight %	Due Date and Time
Essay style take home exam 1	Critical review on pharmacological characteristics of comparable drugs	15	Tue Oct 20, 2020 9:30 AM
Essay style take home exam 2	Critical review on caveats in physiological and pharmacological practices	20	Mon Dec 7, 2020 9:30 AM
Essay style take home exam 3	Critical review of drug design	20	Mon March 15, 2021 9:30 AM
Essay style take home exam 4	Feasibility study of potential drug target and pre-clinical steps involved	35	Mon April 5, 2021 5:00 PM
Group presentation + active class participation (in-class discussions and activities)	Pitfalls in Physiological and Pharmacological Practice; Presentations in groups by students	10	Thu Dec 3, 2020 1:00-4:50 PM



**ASSESSMENT AND EVALUATION INFORMATION**

**ATTENDANCE AND PARTICIPATION EXPECTATIONS:** It is expected that students attend all lectures, actively participate in in-class discussions and activities and take notes during class, and not rely solely on material supplied by the instructors. Missing multiple lectures may jeopardize the ability to achieve a good grade in this course.

**GUIDELINES FOR SUBMITTING ASSIGNMENTS:** Take home assignments need to be uploaded on the course D2L site. Preferred file format: PDF

**FINAL EXAMINATIONS:** none

**EXPECTATIONS FOR 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 writing is emphasized, and the grading thereof in determining a student’s mark in this course. The University of Calgary 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). Take home assignments have to be written as a proper essay-style report thus not in note form or bullet points. It has to be fully referenced using proper and consistent referencing techniques.

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 AND/OR MISSING ASSIGNMENTS:** Late assignments are not accepted in the absence of an urgent medical or justification provided prior to the exam or assignment due date.

**Is a passing grade on a particular component essential to pass the course as a whole?** No

COURSE TIMETABLE			
Course Schedule Date	Topic & Reading	Instructor	Assignments/Due Dates & Times
Sep 29, 2020	Welcome and Introduction	Hermann	
Sep 30, 2020	Pharmacodynamics	Hermann	
Oct 1, 2020	Pharmacodynamics	Hermann	
Oct 5, 2020	Pharmacodynamics	Hermann	

Oct 6, 2020	Cell signaling/signal transduction	Hermann	
Oct 7, 2020	Cell signaling/signal transduction	Hermann	
Oct 8, 2020	Pharmacokinetics	Hermann	
Oct 12, 2020	Thanksgiving; no lecture		
Oct 13, 2020	Pharmacokinetics	Hermann	
Oct 14, 2020	Pharmacokinetics	Hermann	
Oct 15, 20120	Q&A period; Intro PPP&P	Hermann	
Oct 19, 2020	FDA: Pre-clinical toxicology testing	Hermann	
Oct 20, 2020	How to give an effective presentation	Hermann	
Oct 20, 2020			First take home assignment due; 9:30 AM
Nov 23, 2020	Biologics	Kurz	
Nov 24, 2020	Pain and anti-inflammatory drugs	von der Weid	
Nov 25, 2020	Fundamentals of drug development	Proud	
Nov 26, 2020	Fundamentals of drug development	Proud	
Nov 23, 2020	Intro in ion channels	Hermann	
Dec 1, 2020	Ion channels and disease	Chen	
Dec 2, 2020	Ion channels and disease	Hermann	
Dec 3, 2020	Ion channels and disease	Zamponi	
Dec 3, 2020	Pitfalls in Physiological and Pharmacological Practice workshop		PPP&P 1:00-4:50 PM
Dec 7, 2020			2 <sup>nd</sup> Take home essay due 9:30 AM
Feb 22, 2021	Handout Winter semester assignments	Hermann	
Feb 23, 2021	Transgenic mice: what are the options? <a href="#">Online</a>	Rancourt	

Feb 24, 2021	Immunohistochemistry as an analytical tool	Chan	
Feb 25, 2021	The real thing: designing drugs within a Pharmaceutical company	Fraser	
March 1, 2021	Diagnostics and technologies	Trudel	
March 2, 2021	Diagnostics and technologies	Dunn	
March 3, 2021	Diagnostics and technologies	Kallos	
March 4, 2021	Diseases, therapeutics and devices	Hemberger	
March 8, 2021	Diseases, therapeutics and devices	Cavin	
March 9, 2021	Diseases, therapeutics and devices	Shutt	
March 10, 2021	Diseases, therapeutics and devices	Rauk	
March 11, 2021	Diseases, therapeutics and devices	Tuplin	
March 15, 2021			3th Take home essay due 9:30 AM
March 15, 2021	Diseases, therapeutics and devices	Corcoran	
March 16, 2021	Diseases, therapeutics and devices	Ousman	
March 17, 2021	Diseases, therapeutics and devices	Raj	
March 18, 2021	Diseases, therapeutics and devices	Kiss	
March 22, 2021	Diseases, therapeutics and devices	TBD	
March 23, 2021	Diseases, therapeutics and devices	Colicos	
March 24, 2021	Diseases, therapeutics and devices	Slater	
March 25, 2021	Wrap up and Q&A final assignment	Hermann	
April 5, 2021			4 <sup>th</sup> Take home essay due 5:00 PM

### 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>.



## 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/electronic-communicationspolicy.pdf>.

## MEDIA AND RECORDING IN LEARNING ENVIRONMENTS

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

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 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 <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.pdf](http://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.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 <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 (<http://www.ucalgary.ca/provost/students/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 (Room 370, MacEwan Student Centre), <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services> and the Campus Mental Health Strategy website <https://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: <https://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: <https://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 <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.