

MDSC 351
Honours cell and molecular biology

Instructor:

Mayi Arcellana-Panlilio, PhD, Course coordinator & Lecturer
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Office Hours/Policy on Answering Student Emails

Please feel free to make an appointment to meet with the Instructor by sending an e-mail with “MDSC 351” in the subject line of the message. Any questions or concerns can also be communicated by e-mail. Messages from students will be answered within 24-48 hrs.

Teaching Assistants:

Maryam Al-Khannaq, Graduate teaching assistant
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Rujuta Deshpande, Graduate teaching assistant
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Santhosh Nathan, Graduate teaching assistant
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Tanaeem Rehman, Peer mentor
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Time and Location:

This course will take place **online** via Zoom and Desire2Learn (D2L). To best succeed in the course, students are encouraged to participate in the synchronous classes on Zoom and the asynchronous learning tasks in the D2L learning environment.

On Tuesdays, synchronous Zoom lectures and integrated tutorials run from 3:30 to 6:30 pm.

On Thursdays, synchronous Zoom lectures run from 3:30 to 5:30 pm.

When unable to participate live due to the time difference or unforeseen circumstances, inform the instructor in advance and propose to discuss an alternative activity. This may not always be possible.

Prerequisite/Co-Requisite:

MDSC 341 and enrollment in the BHSc Honours program, or consent of instructor.

Course Description:

Introduction to principles in cellular and molecular biology. Emphasizes how structure underlies and determines function in the cell and how complex processes are organized and regulated at the molecular level.

Overarching Theme

Combining interactive lectures, small group discussions, and inquiry-based learning, this course intends to build on the concepts learned in the introductory biology and genetics courses and to provide the solid background in cellular and molecular biology that students in the Bachelor of Health Sciences need to understand many aspects of modern medical sciences. This course will focus on the structural organization of cells and the molecular basis of dynamic cellular processes, with emphasis on eukaryotic cells. Topics will include membrane trafficking, cell signaling, cytoskeleton, cell cycle, and cells and their environment.

Global Objectives

- By the end of this course, the student will have learned key concepts of cell and molecular biology, specifically how structure underlies and determines function in the cell, and how complex processes are organized and regulated at the molecular level.

Course Learning Outcomes

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

1. Explain key concepts of cell and molecular biology;
2. Apply their understanding of these concepts in new situations;
3. Draw connections among ideas, whether presented in this course or elsewhere;
4. Evaluate ideas, evidence, and interpretations;
5. Articulate their learning through original work (written or in other media);
6. Facilitate the learning of others; and
7. Reflect on their performance.

Required Textbook

Iwasa J and Marshall W. 2020. Karp's Cell and Molecular Biology. Hoboken, N.J.: John Wiley & Sons, Inc. Ninth edition.

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.

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.

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/>.

Evaluation

The University policy on grading and related matters is described in section F of the 2020-2021 Calendar.

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

<i>Problem summary essay 1</i>	<i>15%</i>	<i>Associated learning objectives: 1-7</i>
<i>Problem summary essay 2</i>	<i>15%</i>	<i>Associated learning objectives: 1-7</i>
<i>Exam #1</i>	<i>20%</i>	<i>Associated learning objectives: 1-4</i>
<i>Exam #2</i>	<i>20%</i>	<i>Associated learning objectives: 1-4</i>
<i>Novel problem- on-line group work</i>	<i>10%</i>	<i>Associated learning objectives: 1-7</i>
<i>Novel problem- written</i>	<i>10%</i>	<i>Associated learning objectives: 1-5, & 7</i>
<i>Participation and tutorials</i>	<i><u>10%</u></i>	<i>Associated learning objectives: 1-7</i>
	<i>100%</i>	

***There is no final exam for this course.*

*** A student's final grade for the course is the sum of the separate components. It is not necessary to pass each one 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 2020-21 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 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.

A Note regarding Group Work:

Students will be assigned randomly to working groups at the beginning of the semester. These groups will meet in Zoom breakout rooms for tutorials and small group discussions held during class times. The end-of-semester Novel Problem project will be completed by these same groups whose members will collaborate on the project online. Each group will have their own discussion forum on D2L where they will log their conversations to select a topic, decide on a presentation theme, assign tasks, do individual research, and post links to articles or summaries to the group. The presentations, put together without members meeting face-to-face, will be aired by each of the groups (with each member contributing from their respective remote locations) to the entire class using Zoom.

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:

Any unexcused late submissions will suffer a penalty of 10% per day. No submissions will be accepted beyond the 3rd day for any assignment, except the novel problem essay, which cannot be accepted beyond the 2nd day due to final grade deadlines.

Students who miss an exam will receive a mark of zero unless the instructor has been previously notified. There will be NO exceptions to this policy.

Extensions will NOT be granted on any assignment or exams. 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. 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).

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.

Attendance

While attendance per se is not compulsory, one should be aware that participation comprises 10% of the final mark, and this component includes participation in in-class activities and tutorials, as well as submission of short assignments given during class.

Also, attendance will be checked on both days of the Novel Problem presentations.

Conduct During Lectures

The classroom (whether in-person or virtual) 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>.

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

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>). 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.

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/.

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.

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 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>

MEDIA RECORDING

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

Media recording for the assessment of student learning

The instructor will use the Record function on Zoom to create a record of the Novel Problem presentations as part of the assessment of students. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose. According to the statement on media document cited above, consent is not required (Article 6.1).

Sexual 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/policies/files/policies/sexual-violence-policy.pdf>

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

Student Success Centre	http://www.ucalgary.ca/ssc/
Student Wellness Centre	http://www.ucalgary.ca/wellnesscentre/
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 suvpaca@ucalgary.ca; the SU representatives for the Cumming School of Medicine can be reached at medrep1@su.ucalgary.ca or medrep2@su.ucalgary.ca.

Student Success Centre

The Student Success Centre provides services and programs to ensure students can make the most of their time at the University of Calgary. Our advisors, learning support staff, and writing support staff assist students in enhancing their skills and achieving their academic goals. They provide tailored learning support and advising programs, as well as one-on-one services, free of charge to all undergraduate and graduate students. For more information 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 following is a list of topics for class, readings, and assignment / exam due dates. Please note that unforeseen circumstances may cause changes to the schedule with respect to the timing of topics. Students will be notified of all changes in a timely manner by way of email and D2L announcements. The exam dates are firm and will not be altered. All lectures and tutorials will be synchronous.

2021	MDSC 351	All classes on Zoom	
	Lectures	Tutorials	Karp 9e
Week 1			
12-Jan	Intro/overview of cells & cell research	Tutorial 1: Sample problem/Small-group tutorial form	1
14-Jan	DNA structure & DNA replication		10,13
Week 2			
19-Jan	Gene expression& control of gene expr	Tutorial 2: Giving due credit/ Summary writing exerc	11,12
21-Jan	Cell structure and function: the nucleus		12
Week 3			
26-Jan	Plasma membrane I	Tutorial 3: Introduce Problem summary #1	4
28-Jan	Plasma membrane II		4
Week 4			
02-Feb	Cytoplasmic membrane systems I	Tutorial 4: Personal reflection in inquiry learning	8
04-Feb	Cytoplasmic membrane systems II		8
Week 5			
08-Feb		PS#1 submission deadline Monday night, 11:59 pm	
09-Feb	Mitochondria and energy metabolism	Tutorial 5: Mapping of midterm concepts	5
11-Feb	Cytoskeleton and cell movement		9
Week 6			
16-Feb	Reading Week - no classes		
18-Feb			
Week 7			
23-Feb		Tutorial 6: Review Session	
25-Feb	Exam #1: material from Jan 12th to Feb 11th; Written as D2L Quiz		
Week 8			
02-Mar	Cell junctions, adhesion, and the ECM	Tutorial 7: Introduce PS#2	7
04-Mar	Cell signaling I		15
Week 9			
09-Mar	Cell signaling II	Tutorial 8: Brainstorming for novel problem	15
11-Mar	Cell cycle	Novel problem plan due Thursday night, 11:59 pm	14
Week 10			
15-Mar		PS# 2 submission deadline Monday night, 11:59 pm	
16-Mar	DNA Damage and repair	Tutorial 9: Groups meet (on-line)	13
18-Mar	Apoptosis		15
Week 11			
23-Mar	Cancer	Tutorial 10: Groups meet (on-line)	16
25-Mar	Immune Response		17
Week 12			
30-Mar		Tutorial 11: Review Session	
01-Apr	Exam #2: material from Mar 2nd to Mar 25th; Written as D2L Quiz		
Week 13			
06-Apr	Presentations - Zoom	Peer evaluations for Tue presentations due at 11:59 pm	
08-Apr	Presentations - Zoom	Peer evaluations for Thu presentations due at 11:59 pm	
09-Apr	Submission of group presentations on D2L at 11:59 pm		
Week 14			
15-Apr	Course evaluations/Wrap-up lecture		
17-Apr		Novel problem essay due Thursday night, 11:59 pm	