

**CHEM/MBIO 2370**  
**BIOCHEMISTRY II: CATABOLISM, SYNTHESIS, AND INFORMATION PATHWAYS**  
**WINTER 2021**

**Note: there will be two UMLearn sites for this course; one for the lecture sections and one for each laboratory section. Please check both regularly.**

**Instructors**

Dr. Mazdak Khajehpour  
Mazdak.Khajehpour@umanitoba.ca

Dr. Gerd Prehna  
Gerd.Prehna@umanitoba.ca

**All questions via email should be directed to Dr. Prehna regardless of your lecture section.**

**Office Hours**

Office hours (Zoom): Monday 1PM to 2PM, Wednesday 11:30AM to 12:30AM  
Office hours will take place over the Zoom platform and links will be provided through UMLearn. If you attend office hours you must have a microphone and your webcam turned on. You will not be allowed in office hours if you do not show yourself.

**Lecture Time/Location**

Tuesday/Thursday 8:30AM to 9:45AM and 11:30AM to 12:45PM  
Zoom meeting – posted in UMLearn

All lecture-related material will be available to registered students through the UMLearn website. Lectures will be presented in your assigned lecture slot through the Zoom Platform, for which the link will be provided through the UMLearn site. Lectures will be recorded and posted on the UMLearn site for a limited time (1 week) for students to view asynchronously. **Material presented in class takes precedence over all other material.**

**Laboratory**

Dr. Ellert Nichols  
406B Parker Building  
Ellert.Nichols@umanitoba.ca

There will be no scheduled office hours this term. Discussion forums for each experiment and the lab exam will be set up in the B01-B05 sections of UM Learn for this course. Zoom meetings with Dr. Nichols can be scheduled on an as needed basis.

Except for the information contained in this document, all further online information respecting the laboratory will be found in the B01-B05 sections of this course on UM Learn.

The laboratory portion of CHEM/MBIO 2370 will be a mixture of online and in-person delivery. There are five different experiments for which you will be provided data that you will use to prepare five different lab reports. There will also be three in person, Core Skills Labs (I, II and III), that will provide you the opportunity to work with equipment commonly used in the biochemistry laboratory. The in-person laboratories will begin the Week of January 25 and students will be assigned to Core Skills Group A or B. **Attendance at the in-person laboratories is mandatory.** The schedule for when each Group will report to the laboratory can be found in the B01-B05 sections of this course on UM Learn. Your Core Skills Group assignment and laboratory room number will be provided to you during the week January 15 – 22.

Core Skills Labs I, II and III will be graded on a pass/fail basis and you must pass them in order to pass the laboratory. Additional information will be available in your Core Skills Laboratory Manual.

Information about the five online experiments will be available through the B01 - B05 sections of UM Learn for this course. The laboratory manual for the Core Skills Laboratories will be available at the University Bookstore.

Please note that the Department of Chemistry no longer offers Lab exemptions.

### **Evaluation**

Laboratory- reports		12.5%
Laboratory- exam	Monday April 12, 6:00- 7:30 PM	12.5%
Midterm Exam	Tuesday March 2 <sup>nd</sup> , 6:00-8:00 PM	25%
Final Exam	TBA	50%

Students must receive a mark of at least 15/30 on the laboratory portion of the course (practical + exam) to get credit for the course.

**There is no deferred midterm or lab exam.** For students who do not complete the midterm or lab exam, the final exam will be pro-rated. **NO EXCEPTIONS.**

If you miss the Final exam, you must notify both the instructor and an advisor in your faculty of registration within 48hrs of the date of the Final exam. Please include name, student number, and course. Failure to do so will result in an F in the course.

## **Mark Breakdown**

A+	90 to 100%
A	80 to < 90%
B+	75 to < 80%
B	70 to < 75%
C+	65 to < 70%
C	60 to < 65%
D	50 to < 60%
F	< 50%

## **Course Technological Requirements**

Students enrolled in the course must ensure they satisfy the following minimum technological requirements:

- A computing device where one can create and edit documents
- An internet connection capable of streaming videos and downloading software
- Access to a web-cam and microphone
- Zoom application (zoom.us)
- Ability to take pictures and images for upload to UMLearn or Crowdmark (Exams)

## **Exam details**

Exams will be given remotely and will be invigilated via the zoom application. Exams will be closed notes/book and you must work individually. During the exam your camera and microphone must remain on with your work space and immediate surroundings visible to the camera (camera tilted down so hands are visible). Please turn down the volume on your own computer so you do not hear other students. The exam zoom host will have the questions shared via their screen and/or the exam will be provided through download (email/UMLearn). After the exam is complete, you will be expected to take pictures of your exam pages for upload to UMLearn or Crowdmark.

## **Professional Conduct**

We recognize that these are unusual circumstances and some adjustments need to be made when working virtually. At the same time, we do want to remind you that University policies, such as the **Respectful Work and Learning Environment policy**, still apply, as do basic expectations around how students will engage with each other and all members of the University. This means that when participating in classes, online meetings, etc., students are expected to behave professionally, and follow the same basic norms as they would in person, such as being properly clothed, not being impaired, and participating respectfully. **Essentially, if you wouldn't do it in an in-person class, don't do it in a virtual setting.**

Please familiarize yourself with the UM Respectful Work and Learning Environment (RWLE)

[http://umanitoba.ca/admin/governance/media/Respectful Work and Learning Environment RWLE Policy - 2016 09 01.pdf](http://umanitoba.ca/admin/governance/media/Respectful_Work_and_Learning_Environment_RWLE_Policy_-_2016_09_01.pdf)

Section 2.5(c) of the Student Non-Academic Misconduct and Concerning Behaviour Procedure describes types of inappropriate or disruptive behaviour ([https://umanitoba.ca/admin/governance/media/Student Non-Academic Misconduct and Concerning Behaviour Procedure - 2018 09 01.pdf](https://umanitoba.ca/admin/governance/media/Student_Non-Academic_Misconduct_and_Concerning_Behaviour_Procedure_-_2018_09_01.pdf)).

### **Academic Integrity**

Academic integrity is taking responsibility for and being honest with your work and respecting the work of others. Since you are a member of the university community, we want you to learn what that responsibility and honesty entails and how we respect the work of others.

The Faculty of Science continues to uphold high standards of academic integrity. We know that our students support us in this endeavour and we count on each and every one of you to do your part. The same academic standards apply online, remote learning, and in class education. We expect all students to strictly adhere to instructions from their professors regarding what resources can and cannot be used during exams, to follow all rules professors decide to set.

To aid professors in ensuring that all forms of assessments have been administered fairly, the University will be electronically monitoring tests, quizzes and examinations, included, but not limited to overseeing chat-rooms, relevant predatory web-sites and, in so doing, we will analyze scholastic evidence of individual exams. E-monitoring tools may include one of the following: Respondus Lockdown Browser & Respondus Monitor; WebEx; Zoom or Microsoft Teams.

Please carefully review information with regards to academic integrity **be aware; be proactive; be smart and be honest.**

Academic Integrity Message from Associate Dean Krystyna Koczanski : <https://youtu.be/Ok-lilm4SeE>

UM Respondus Student Guide

<https://universityofmanitoba.desire2learn.com/d2l/le/content/6606/viewContent/1463719/View>

The Student Discipline By-Law may be accessed at:

[http://umanitoba.ca/admin/governance/media/Student\\_Discipline\\_Bylaw\\_-\\_2009\\_01\\_01.pdf](http://umanitoba.ca/admin/governance/media/Student_Discipline_Bylaw_-_2009_01_01.pdf)

The list of suggested minimum penalties assessed by the Faculty of Science for acts of academic

dishonesty is available on the Faculty of Science webpage:

[Faculty of Science – Suggested Minimum Penalties for Acts of Academic Dishonesty](#)

### **Course Withdrawal policies**

January 29, 2021 – Last date to drop Winter courses and receive a 100% refund

January 30, 2021 – Last date to add Winter Term courses

March 31, 2021 – Winter term Voluntary Withdrawal (VW) deadline

**VW:** Students have the opportunity to voluntarily withdraw (VW) from this class up to March 31, 2021. By then, you will have received feedback to allow you to assess your progress and determine if you are achieving the grade you are aiming for in this course. If you are unlikely to be successful in the course, or you are not achieving the grade that you are aiming for, you should consider a VW from the course. You may contact me to review your progress in more detail, or you may discuss the VW option with a Faculty academic advisor. Students enrolled in the course after the VW deadline will be assigned a final grade.

[http://umanitoba.ca/u1/know\\_yourself/573.html](http://umanitoba.ca/u1/know_yourself/573.html)

**AW:** At times medical or compassionate circumstances arise in a student's life that prevent them from performing as they would in normal circumstances. If you are in this position, please contact a Faculty academic advisor to discuss your options. Be prepared to provide documentation, which supports your situation.

[http://www.umanitoba.ca/student/resource/student\\_advocacy/authorized-withdrawal/index.html](http://www.umanitoba.ca/student/resource/student_advocacy/authorized-withdrawal/index.html)

**Limited Access Policy:** The Senate Executive Committee approved, on behalf of Senate that section 2.5(a) of the Repeated Course Policy to be suspended indefinitely. Sec 2.5 refers to Limited Access. Suspension of LAP means that you can retake the course you have decided to VW in the next semester.

### **Using Copyright material**

Please respect copyright. We will use copyrighted content in this course. University guidelines state that copyrighted works, including those created by instructors of the course are made available for private study and research and must not be distributed in any format without permission. Since it is illegal, do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the Copyright Act applies or written permission has been confirmed.

## **Course Outline**

An introductory course dealing with the basic metabolic processes that occur in living cells including the production and use of metabolic energy, the breakdown and synthesis of biomolecules, the synthesis of DNA, RNA and proteins; and the regulation of these processes.

\*\*In order to register for this course, a grade of C or higher is required in Biochemistry I (2360) and Organic Chemistry I (2210).

### **TEXTBOOK (Useful but not required):**

*Lehninger*. Principles of Biochemistry, 7<sup>th</sup> Edition (Nelson and Cox).

## **Modules**

1. Glycolysis (Khajehpour)
2. TCA Cycle (Khajehpour)
3. Electron Transport Chain (Prehna)
4. Photosynthesis (Prehna)
5. Lipid Catabolism (Khajehpour)
6. Amino Acid Catabolism (Khajehpour)
7. Carbon Fixation (Prehna)
8. Gluconeogenesis and the Pentosephosphate Pathway (Prehna)
9. Glycogen metabolism (Khajehpour)
10. Nitrogen Fixation (Khajehpour)
11. Amino Acid and Nucleotide Synthesis (Prehna)
12. Fatty Acid Synthesis (Khajehpour)
13. DNA structure (Prehna)
14. DNA metabolism (Prehna)
15. RNA metabolism (Prehna)
16. Translation (Prehna)