

MICR302
Molecular Microbiology
CRN 22141
Winter / Spring 2021

Course Format:

This course will be delivered as a combination of live online sessions conducted via Zoom (Jan11- Mar11) and asynchronous prepared lectures posted on Brightspace (Mar15 -April 12). Assessments will be delivered online through Brightspace or by email. Students must sign in with their UVic accounts (yourname@uvic.ca) to access online sessions, course materials, and test materials.

Class time/location:

Jan11- Mar11: Mon, Thurs, 11:30 – 12:50, via Zoom

Mar15 -April 12: Asynchronous lectures posted on Brightspace.

Instructor: Dr. Doug Briant (Jan 11 - Mar 11)

Office hours: Mondays, 9 – 11am via Zoom

e-mail: dbriant@uvic.ca

Instructor: Dr. Chris Nelson (Mar 15-April 12),

Office hours: Mon, Thurs, 11:30 – 12:50, via Zoom

e-mail: cjn@uvic.ca

Textbook: Since the course material is as up-to-date as possible, there is no course textbook. Much of the source material (papers) will be provided on-line in the Brightspace site, and will serve as an additional resource. You will need your UVic NetLink ID and password to access this information.

It is, however, recommended that you have easy access to a standard microbiology textbook.

Brightspace site: a Brightspace site will be maintained for this course. Some, but not all, lecture notes will be made available. It contains the following sections:

General Information: course outline, discussion forum, contact information, zoom links etc.

Friendly Scientist Information: information about the Friendly Scientist social hours, including Zoom links and schedules.

Academic Integrity Quiz: you must score 100% on this quiz before you will be allowed to write any Participation Quizzes, Midterms or the Final Exam.

Lecture notes: Notes will generally be made available here prior to lectures. Notes are arranged by topic, and a single topic may span multiple lectures.

Lecture notes are not complete, and students will be responsible for all materials covered in the lectures.

Lectures: recorded Zoom lectures and pre-recorded audio lectures.

Exam material: reviews, old exams and the actual exams will be here.

MICR302 course learning objectives:

- In this course, you will gain the tools to recognize relationships between DNA, RNA and protein. Applying these tools, you will be able to evaluate the specific contributions of different molecular mechanisms microbes utilize to respond to environmental changes.
- You will have the ability to compare microbial communication and signalling strategies.
- You will understand the importance of the microbiome in maintaining human health.
- You will be able to critically analyse and interpret primary scientific literature
- You will be able to discuss the utility of budding yeast as a model eukaryotic system.
- You will be able to interpret and design molecular and genetic experiments in the budding yeast system.
- You will be able to describe systems-biology approaches and explain how they are revolutionizing research in molecular biology

By the end of the course, it is expected that each student will be capable of examining a biological response and hypothesizing which underlying genetic and/or biochemical process defines the response. Students will then be able to design experiments, including all relevant controls, to test their proposed hypothesis.

Important dates and evaluation:

EVALUATION	Date	Notes
25% DJB test 1	Thursday, February 04,	<i>online via Brightspace. Exams are open from 8:30am – 8:30pm. Once you start you will have <u>90 minutes</u> to complete the exam.</i>
40% DJB test 2	Thursday, March 11, cumulative	<i>online via Brightspace. Exams are open from 8:30am – 8:30pm. Once you start you will have <u>2 hours</u> to complete the exam.</i>
15% CJN test 3	Friday, Mar 25	<i>online via Brightspace. Exams are open from 8:30am – 8:30pm. Once you start you will have <u>90 minutes</u> to complete the exam.</i>
20% CJN test 4	Set by registrar (cumulative Mar15-April 12)	<i>online via Brightspace. Exams are open from 8:30am – 8:30pm. Once you start you will have <u>90 minutes</u> to complete the exam.</i>

- Students are responsible for ensuring that they are properly registered in the course.
- Students are expected to have met all pre/co-requisites for the course (see above).

Grading:

A⁺	90 -100	B⁺	77 - 79	C⁺	65 - 69	F	< 50
A	85 - 89	B	73 - 76	C	60 - 64	N **	< 50
A⁻	80 - 84	B⁻	70 - 72	D	50 - 59		

**** N grades**

Students who have completed the following elements will be considered to have completed the course and will be assigned a final grade:

- ***All four tests must be completed to complete the course***

Failure to complete one or more of these tests will result in a grade of “N” regardless of the cumulative percentage on other elements of the course. An N is a failing grade, and it factors into a student’s GPA as 0. The maximum percentage that can accompany an N on a student’s transcript is 49

Tentative Class Schedule:

topic	comments
1 Introduction	
2 DNA	
a) gene structure and expression	bacterial gene architecture, σ factors, comparison between prokaryotic and eukaryotic systems
3 RNA	
a) structure and regulation	mRNA stability, riboswitches
b) CRISPR	RNA silencing in prokaryotes, gene editing
c) SARS-CoV2	genetics of the virus
4 Protein	
a) two component systems	introduction to prokaryotic protein signalling
b) translational surveillance	identification and destruction of aberrant proteins in prokaryotes
5 Environment	
a) heat shock	role of sigma factors, chaperones and proteases
b) stationary phase	rpoS, σ^S
c) stringent response	response to stringent conditions, including σ and ppGpp
d) sporulation	role of phosphorylation and sigma factors
6 Microbiome	how does the microbiome impact human health?
7 Bacterial Signalling	
a) environmental and community	chemotaxis and two component systems, quorum sensing and bacterial communication, importance of biofilms
8 Budding yeast: a model eukaryote	lifecycle, examples of conserved signal transduction pathways, advanced molecular, genetic and proteomic techniques.
9 Systems and synthetic biology	how budding yeast tools enable high-throughput genomic and proteomic interrogation of biology

DEPARTMENT INFORMATION AND POLICIES

1. The Department of Biochemistry and Microbiology upholds and enforces the University's policies on academic integrity. These policies are described in the current University Calendar. All students are advised to read this section.
2. Cell phones, computers, and other electronic devices must be turned off at all times during live class sessions unless being used for the purpose of connecting and engaging with the class.
3. No recordings of live lectures are permitted without permission of the instructor. Many online courses will be recorded by the instructor for accessibility for students unable to attend. If you do not wish to be recorded, contact your instructor to determine if alternative arrangements can be made.
4. Course materials, such as notes, problem sheets, quizzes, examinations, example sheets, or review sheets, may not be redistributed without the explicit written permission of the instructor.
5. Students are expected to be available for all exams. Instructors may grant deferrals for midterm examinations for illness, accident, or family affliction. Although students do not require documentation, students must contact their instructor and BCMB office (biocmicr@uvic.ca) with the reason for their absence within 48 hours after the midterm exam. The Department will keep a record of the absences. It is the responsibility of the student to ensure all required components are complete, and to arrange deferred exams/assignments with the instructor, which normally should occur within one week of the original exam date.
6. The Department of Biochemistry and Microbiology considers it a breach of academic integrity for a student taking a deferred examination to discuss the exam with classmates. Similarly, students who reveal the contents of an examination to students taking an examination are considered to be in violation of the University of Victoria policy on academic integrity (see current University Calendar). Students must abide by UVic academic regulations and observe standards of scholarly integrity (no plagiarism or cheating). Online exams must be taken individually and not with a friend, classmate, or group, nor can you access notes, course materials, the internet, or other resources without the permission of the instructor. You are prohibited from sharing any information about the exam with others. Use of unauthorized electronic devices and accessing the internet and class material during exams is prohibited unless permission is granted by the instructor. Instructors may use Browser Lockdown Software to block access during classes and exams.
7. Deferral of a final exam must be requested with an Academic Concession form and submitted directly to Undergraduate Records. Deferred final exams for fall term courses will be arranged by the instructor. Deferred final exams or spring term courses will be arranged through Undergraduate Records and must be written before the end of the summer term as stipulated in the University Calendar.
8. Requests for review/remark of a midterm exam must be made within one week of the exam being returned.

9. The instructor reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work.
10. Supplemental exams or assignments will not be offered to students wishing to upgrade their final mark.
11. Anonymous participation in online classes is not permitted without permission of the instructor.

Important note about COVID-related stress

The current pandemic is placing added stressors- financial, mental, and physical- on everyone. Your wellbeing is of foremost importance. If you are experiencing difficulties coping, the University has resources to help. Reach out to Counselling Services, the Centre for Academic Communication, or Learning Assistance Program for assistance.

Centre for Accessible Learning

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, approach the Centre for Accessible Learning (CAL) as soon as possible in order to assess your specific needs.

<https://www.uvic.ca/services/cal/index.php>

Course Experience Survey (CES)

We value your feedback on this course. Towards the end of term you will have the opportunity to complete a confidential course experience survey (CES) regarding your learning experience. The survey is vital to providing feedback to us regarding the course and our teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey, you will receive an email inviting you to do so. If you do not receive an email invitation, you can go directly to your [CES dashboard](#). You will need to use your UVic NetLink ID to access the survey, which can be done on your laptop, tablet or mobile device. We will remind you nearer the time but please be thinking about this important activity.