MICR302
Molecular Microbiology
Summer 2020

Class time/location:
This offering of MICRO302 is delivered completely on line. The course is a blend of asynchronous and synchronous lectures as follows:

- Student availability during course hours is ***recommended*** for Mon and Weds 10:30am-12:20pm PST. During these sessions, instructors will hold open office hours via Zoom/Blackboard Collaborate to support student progress through assigned asynchronous learning materials.

- Student participation on Thursday sessions (Thurs 10:30am-12:20pm PST) is a ***required component of the course*****;** during these synchronous sessions, live lectures and/or class activities will take place via Zoom/Blackboard Collaborate.

Course co-ordinator and Instructor: Dr. Lisa Reynolds (July 6-July 27)
e-mail: lisareynolds@uvic.ca

Instructor: Dr. Chris Nelson (July 29-Aug 20)
e-mail: cjn@uvic.ca

Prerequisites:
MICR 200A and MICR 200B; and
BIOC 299 or BIOC 300A.

Textbook: Since the course material is as up-to-date as possible, there is no course textbook.

Course Material:
The core course material will be provided in the form of asynchronous learning materials (Slides and corresponding Audio files) which will be posted on the CourseSpaces site. Additional course materials (e.g. papers) will also be provided through the CourseSpaces site. Materials will be organized into 'Topics'. Students are expected to work through this material independently, using Mon and Wednesday office hours to ask questions if necessary.

During Thursday synchronous sessions students will work in groups on problem-solving activities that draw on the knowledge learned from course materials. Details on each activity will be provided in advance through CourseSpaces.

Software and communication platforms:
CourseSpaces serves as the central information source for the MICR302. Zoom or Blackboard Collaborate will be used for synchronous sessions, office hours, and one-on-

one appointments. Details on how Zoom/Blackboard Collaborate platforms will be implemented will be shared through CourseSpaces.

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 that microbes utilize to respond to environmental changes.

• You will have the ability to compare microbial communication and signaling strategies.

• You will be able to give examples of how the microbiome contributes to human health.

• You will be able to critically analyse and interpret primary scientific literature.

• You will be able to discuss the fundamental aspects of the budding yeast lifecycle, and explain which of these aspects make it a useful model eukaryotic system.

• You will be able to discuss several systems biology approaches that are revolutionizing research in molecular biology.

• You will be able to describe how to use a yeast system to extract information on the modes-of-action of pathogen effector molecules or small molecule chemicals

• 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
Quizzes **30%**	Regular multiple choice/short answer Quizzes will be delivered through CourseSpaces. Students will have approximately one week to complete each quiz.
Synchronous Groupwork (Thursdays) 6x 5% = **30%**	Group project completed via Zoom/BlackBoard 10:30-12:20pm Group submission by email at end of class.
20% LAR Exam (Open Book)	**Mon July 27** (24 hours to complete)
20% CJN Exam (Open Book)	**Thurs Aug 20** (24 hours to complete)

• 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:

Participation in at least 5 out of 6 groupwork sessions and completion of both exams is a requirement to complete the course

Failure to complete one or more of these elements 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 - DNA structure and expression	Bacterial gene architecture, σ factors, comparison between prokaryotic and eukaryotic systems
3. RNA - RNA structure and regulation - CRISPR	 mRNA stability, riboswitches RNA silencing in prokaryotes, gene editing
4. Protein - Two component systems - Protein splicing - Translational surveillance	Introduction to prokaryotic protein signaling, applications Identification and destruction of aberrant proteins in prokaryotes
5. Response to environmental conditions	- Heat shock - Stationary phase - Stringent response
6. Microbiome	Impact of the microbiome on human health
7. Budding yeast: a model eukaryote	Lifecycle, examples of conserved signal transduction pathways, advanced molecular, genetic and proteomic techniques
8. Systems biology	How budding yeast tools enable high-throughput genomic and proteomic interrogation of biology
9. Studying pathogen and chemical interactions with host cells	Determining modes-of-action of pathogen virulence factors and small molecules using systems-level approaches.
10. Synthetic Biology	Using yeast as a foundation for the *de novo* design of a microorganism.

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 a purpose relevant to the class.

3. Any recordings of live class sessions may only be performed with written permission of the instructor, and are for personal use only. The instructor retains copyright to such recordings and all lecture materials provided for the class (electronic and otherwise); these materials must not be shared or reposted on the Internet.

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, and students must provide appropriate documentation 48 hours after the midterm exam. 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 a deferred examination are considered to be in violation of the University of Victoria policy on academic integrity (see current University Calendar). 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 for 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.

6. Requests for review/remark of a midterm exam must be made within one week of the exam being returned.

7. The instructor reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work.

8. Supplemental exams or assignments will not be offered to students wishing to upgrade their final mark.

9. Anonymous participation in online classes is not permitted without permission of the written permission of the instructor.

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)

I 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 me regarding the course and my 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. I will remind you nearer the time but please be thinking about this important activity.