



**REVISED COURSE OUTLINE FOR REMOTE LEARNING**

To account for the necessary transition to remote learning from March 13 onward, adjustments have been made to assessment deadlines and requirements so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff). If you are unable to meet the deadlines or requirements specified, please connect with your course instructor to work out alternative dates/assessments.

1. **Course:** CMMB 343, Microbiology - Winter 2020

Lecture 01: MWF 15:00 - 15:50 - Remote Learning (check with your instructor or coordinator for details)

Instructor	Email	Phone	Office	Hours
Dr Lisa Gieg	lmgieg@ucalgary.ca	403 210-7207	BI 228A	By Appointment
Dr Peter Dunfield	pfdundie@ucalgary.ca	220-2469	BI 319D	TBA
William Huddleston	wrhuddle@ucalgary.ca	403 220-7739	EEEL 235B	TBA

**Course Site:**

D2L: CMMB 343 L01-(Winter 2020)-Microbiology

**Note:** Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

**Prerequisite(s):**

Chemistry 351 and one of Biology 311 or Medical Science 341.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Laboratory	45	
First Midterm Exam	20	Feb. 12
Second Midterm Exam	20	Mar. 20
2 quizzes (worth 6.5%, 8.5%)	15	Mar. 30, Apr. 9

**Changes:**

Lab value is increased by 5% to 45% of final grade; remaining lab content is being offered online (e.g., by providing data to students).

There will be no lab final exam: the 10% originally allocated for this lab component will be redistributed (added) to the value of the lab reports (8%), and to lab exam 1 (2%).

Each midterm exam weight is increased by 5% to 20% of final grade.

In lieu of Final Exam, 2 short online quizzes (worth 6.5% and 8.5%) will be offered to cover/test material in remaining lectures - these will be given before the last day of classes; March 30 and April 9.

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	93 %	89 %	84 %	79%	76%	73 %	70 %	65%	60%	55 %	50 %

Each piece of work (laboratory reports, midterm test or quizzes) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade using the conversion scale provided below. Students must have attended all laboratory classes (while this was still possible); lab assignments will not be accepted from students who were absent without a valid excuse from the lab in which data were collected/distributed. Students who missed a substantial number of labs will not be permitted to write the final laboratory exam (which will be held as an online quiz).

#### 4. Missed Components Of Term Work:

The University has suspended requirements for students to provide evidence for reasons for absences so please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations. Please let your instructor know immediately if you are ill and cannot meet the deadlines specified.

Attendance is required at all laboratory classes for the duration of the scheduled lab time, and you may only attend your registered lab section due to space, equipment and safety limitations. Students with unexcused absences will not be permitted to write the lab exams. Assignments will not be accepted if you have an unexcused absence from the lab in which data are collected.

#### 5. Scheduled Out-of-Class Activities:

The following out of class activities are scheduled for this course.

Activity	Location	Date and Time	Duration
Weekly lab exercises will require students to return to the lab the day following their scheduled lab to record experimental results. Throughout the month of March 2020.	LAB	Monday, March 2, 2020 at 12:00 pm	30 Minutes

**REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.** If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

This course requires time in the laboratory outside of scheduled laboratory times. If your class schedule conflicts with the open lab times, contact W Huddleston to make alternate arrangements. See the Laboratory information posted on D2L. The open labs will run throughout March and will be open throughout the day (Monday, Wednesday and Friday) to accommodate students.

#### 6. Course Materials:

Required Textbook(s):

Madigan, Bender, Buckley, Settle, Stahl, *Brock Biology of Microorganisms, 15th Ed.*: Pearson.  
Huddleston et al., *CMMB 343 Lab Manual 2020* : posted on D2L.

Recommended Textbook(s):

Leboffe and Pierce, *A Photographic Atlas for the Microbiology Laboratory, 4th Ed.*: Morton.

#### 7. Examination Policy:

No electronic or written aids (e.g. cell phones, tablets, computers, PDAs, notes, textbooks) will be allowed during writing of any exams. Non-programmable calculators will be permitted to answer quantitative questions on exams, if applicable, and permission to do this will be clearly indicated on the examination paper. Students should also read the Calendar, Section G, on Examinations.

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#### 8. Approved Mandatory And Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

## 9. Writing Across The Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

In this course, the quality of the student's writing in laboratory reports will be a factor in the evaluation of those reports. See also Section E.2 of the University Calendar.

## 10. Human & Living Organism Studies Statements:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

**STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS.** Students taking laboratory and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

Students are expected to be familiar with [Section SC.4.1](#) of the University Calendar.

## 11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. Other Important Information For Students:

- a. **Mental Health** 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 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, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the

university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208).

- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).  
  
Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email [addy@ucalgary.ca](mailto:addy@ucalgary.ca) or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.
- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- i. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- l. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

### **CMMB 343 - Lecture schedule Winter 2020 (Tentative, subject to change)**

#### **Date Topic Lecturer**

1. Jan 13 Introduction to Microbiology **PD**
2. Jan 15 Microbiology - History and Diversity **PD**
3. Jan 17 Microbial Ecosystems **PD**
  
4. Jan 20 Adaptation to Extreme Environments **PD**
5. Jan 22 Cell Structure I - Cell Envelope **1PD**
6. Jan 24 Cell Structure II - Cell Envelope **2PD**
  
7. Jan 27 Cell Structure III - Other cell structures **PD**
8. Jan 29 Motility & Chemotaxis **PD**
9. Jan 31 Microbial Growth **PD**
  
10. Feb 3 Metabolism I (glycolysis) **PD**
11. Feb 5 Metabolism II (TCA cycle, electron transport chain) **PD**
12. Feb 7 Fermentation & anaerobic respiration **LG**
  
13. Feb 10 Lithotrophy & CO<sub>2</sub> fixation **LG**
- Feb 12 Midterm Exam 1 (in class, 50 min) Lectures 1-12**
  
14. Feb 14 Carbon Cycle **PD**
- Feb 17-21 Winter Break - no classes**
  
15. Feb 24 Nitrogen cycle **PD**
16. Feb 26 Microbial symbioses I **PD**
17. Feb 28 Microbial symbioses II **PD**
  
18. Mar 2 Information flow (DNA→RNA→protein) **LG**
19. Mar 4 Microbial chromosomes organization **LG**
20. Mar 6 Transposable elements **ILG**
  
21. Mar 9 Transposable elements **ILG**
22. Mar 11 Virology **ILG**
23. Mar 13 Virology II/ Transposable elements **ILG** - given March 18 online - all lectures from this point on will be given via narrated powerpoint presentations
  
24. Mar 16 Genomes/Genomics **IPD** - will be given March 23
25. Mar 18 Genomes/Genomics **IPD** - **cancelled**
- Mar 20 Midterm Exam 2 (in class, 50 min) Lectures 13-23**
  
26. Mar 23 Genetic Engineering **LG - cancelled**
27. Mar 25 Microbial communication **LG** - to be given March 25 as planned
28. Mar 27 Microbiome/Pathogenesis **ILG**
29. Mar 30 Pathogenesis **ILG**
30. Apr 1 Immunology **ILG**
31. Apr 3 Immunology **ILG**
  
32. Apr 6 Microbial Applications **ILG**
33. Apr 8 Microbial Applications **ILG**
  
- Apr. 10-13 Easter break, no classes**
  
34. Apr 15 Review/Q&A **LG/PD** - cancelled, no final exam

**Final Exam (cumulative): April 18-29, 2020**

**LAB SCHEDULE Winter 2020**

**B01/B03/B05/B07 - EEEL 369**

## B02/B04/B06/B08 - EEEL 303

### **Date Exercise**

January 14/16 **LABORATORY 1**

Complete Laboratory Quiz 1 **before** your next scheduled lab

January 21/23 **LABORATORY 2**

January 28/30 **LABORATORY 3**

Complete Laboratory Quiz 2 **before** your next scheduled lab

February 4/6 **LABORATORY 4**

Complete Laboratory Quiz 3 **before** your next scheduled lab

February 11/13 **LABORATORY 5**

February 18/20 **Winter Break - no labs**

February 25/27 **LAB EXAM 1**

**BACTERIAL UNKNOWN PROJECT**

March 3/5 **PRESENTATIONS**

**BACTERIAL UNKNOWN PROJECT**

March 10/12 **LABORATORY 6**

**BACTERIAL UNKNOWN PROJECT**

Complete Laboratory Quiz 4 **before** your next scheduled lab

March 17/19 **LABORATORY 7 - data provided online**

**BACTERIAL UNKNOWN PROJECT**

Complete Laboratory Quiz 5 **before** your next scheduled lab

March 24/26 **LABORATORY 8**

**BACTERIAL UNKNOWN PROJECT - data provided online**

March 31/April 2 **No labs**

April 7/9 **LAB EXAM 2 - to be held as online quiz**

### **RESERVED READING LIST**

Brock Biology of Microorganisms (14<sup>th</sup> edition), Madigan, Martinko, Stahl and Clark, 2015

Microbiology: An Evolving Science (3<sup>rd</sup> edition), Slonczewski and Foster, 2013

Bergey's Manual of Systematic Bacteriology on ONE HOUR RESERVE - 7<sup>th</sup> Ed. - QR 81 S63

8<sup>th</sup> Ed. - QR 81 S63

9<sup>th</sup> Ed. vol.1 - QR 81 S633

vol.2 - QR 81 S633

### **Course Outcomes:**

- Describe and explain the differences between organisms in the three Domains (Eukarya, Archaea, and Bacteria). Further you should be able to explain which of the three are Prokaryotes. (Disciplinary knowledge, Science in society)
- Explain and discuss the prominent role of Prokaryotes in a. Evolution b. Nutrient cycling c. Extreme environments

- Describe and discuss topics in the field of microbiology, such as bacteriology, virology, immunology, bacterial genetics, molecular biology, bacterial ecology, metabolism, host-microbe interactions. (Disciplinary knowledge, Science in Society)
- Work safely and effectively with bacteria and bacteriophage using sterile technique with bacteria (technical skills)
- Communicate effectively in lab reports using appropriate scientific terms
- Create a presentation on a specific microbe
- Identify an unknown microbe using appropriate diagnostic tools
- Work with another student to carry out experiments, collect and analyze the data and then write your lab reports independently

Electronically Approved - Mar 23 2020 16:27

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**Department Approval**

Electronically Approved - Mar 24 2020 08:39

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**Associate Dean's Approval for alternate final examination arrangements or remote learning and out of regular class-time activity**