



## COURSE OUTLINE

### 1. **Course:** CMMB 343, Microbiology - Winter 2023

#### **Coordinator(s)**

<b>Name</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
William Huddleston	wrhuddle@ucalgary.ca	403 220-7739	EEEL 235C	TBA

#### **Section(s)**

Lecture 01 : MWF 15:00 - 15:50 in ICT 102

<b>Instructor</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
Dr Peter Dunfield	pfdunfie@ucalgary.ca	220-2469	BI 319D	TBA
William Huddleston	wrhuddle@ucalgary.ca	403 220-7739	EEEL 235B	TBA

**Note:** W Huddleston is the course and lab coordinator

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

#### **In Person Delivery Details:**

**Lectures:** will be delivered in-person during the scheduled lecture time in ICT102 and will **not** be recorded (refer to the lecture schedule below). Lecture notes outlines, suggested textbook reading and practice questions will be posted on D2L. If we move to online learning, information about changes to the lecture component of the course will be provided on D2L.

**Midterm 1:** Lecture Midterm 1 will be on material covered between January 9-February 3. This in-person, closed book assessment will be completed during your scheduled lecture time (location TBD) on February 8. If Midterm 1 has to move online, information about the assessment will be provided on D2L.

**Midterm 2:** Lecture Midterm 2 will be on material covered between February 6-March 10. This in-person, closed-book assessment will be completed during your scheduled lecture time (location TBD) on March 15. If Midterm 2 has to move online, it will follow the same format as Midterm 1.

**Final Exam:** There will be a 2-hour, registrar-scheduled, in-person, cumulative, closed-book final exam (date and location TBD).

**Laboratories:** Labs will be delivered in-person during your scheduled lab time and location and will **not** be recorded (refer to the lab schedule below). Attendance is mandatory and students must attend their scheduled sections. Laboratory manual information, suggested textbook reading and lab assignments will be posted on D2L. If we move to online learning, information about changes to the laboratory component of the course will be provided on D2L.

**Lab Assignments:** Assignments must be submitted before the designated due date/time to be considered for grades. Students with unexcused lates/absences will **not** be permitted to submit an assignment associated with the missed lab session. Assignments submitted after the deadline will not be graded.

#### **Re-Entry Protocol for Labs and Classrooms:**

To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found [here](#).

#### **Course Site:**

D2L: CMMB 343 - Winter 2023 - Microbiology

**Note:** D2L is an important mechanism for both communicating with students (i.e., News) and providing both lecture (i.e., lecture notes outlines) and laboratory (i.e., lab manual) materials. Ensure you check

the D2L site regularly.

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

### Equity Diversity & Inclusion:

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

The Biological Sciences Equity Committee acknowledges there are persistent barriers that prevent such accessibility and hinder our progress towards EDI. Our representatives (faculty, staff, postdocs, graduate and undergraduate students) are committed to addressing any concerns and work towards proactive solutions that enact necessary change within the department. To submit anonymous questions, comments or concerns regarding EDI related issues, please reach out to our Chair, Constance Finney ([constance.finney@ucalgary.ca](mailto:constance.finney@ucalgary.ca)), or a committee representative of your choice at <https://science.ucalgary.ca/biological-sciences/about/equity-diversity-and-inclusion>

### 2. Requisites:

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

#### Prerequisite(s):

Chemistry 351; and 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:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Laboratory Component <sup>1</sup>	30%	Ongoing		
Midterm 1 <sup>2</sup>	20%	Feb 08 2023 at 03:00 pm (50 Minutes)	in-person	TBD
Midterm 2 <sup>3</sup>	20%	Mar 15 2023 at 03:00 pm (50 Minutes)	in-person	TBD
Registrar Scheduled Final Exam <sup>4</sup>	30%	Will be available when the final exam schedule is released by the Registrar	in person	Will be available when the final exam schedule is released by the Registrar

<sup>1</sup> Laboratory assignment and weighting information is posted in the Laboratory content area on D2L

<sup>2</sup> On lecture material covered between January 9-February 3

<sup>3</sup> On lecture material covered between February 6-March 10

<sup>4</sup> The lecture final exam is a cumulative test on material covered between January 9-April 12

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>	95 %	90 %	86 %	82%	78%	74 %	70 %	65%	60%	55 %	50 %

**Note:** A maximum course letter grade of D+ will result if a student has unexcused absences from 2 or more laboratory sessions and/or does not pass (>50%):

1. The combined average of the two laboratory exams (refer to the laboratory schedule below)

2. The laboratory component of the course

This course will have a Registrar Scheduled Final exam that will be delivered in-person and on campus. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the

term. The final exam for this course will be designed to be completed within 2 hours.

**Note:** The final percent course grade will be reported to 2 decimal places (.e., 79.65%) and course grades will not be rounded, curved, scaled, or manipulated in any way. There is no opportunity for replacement, make-up, extra, or bonus course work.

The University of Calgary offers a [flexible grade option](https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

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

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

**Lab Attendance Policy:** Attendance is **required** at all laboratory sessions for the **duration** of the scheduled lab time, and you may only attend your registered lab section due to space, equipment, and safety limitations. If you miss, or are late for, a lab, you must contact the lab coordinator before, on the same day as the missed session, or within 48 hours for unforeseen circumstances. Only valid reasons for absences/lates will be accepted and will be considered on a case-by-case basis. Each lab session runs for one week, so if you are away for an entire week, you will not be able to make up for the missed lab, however, you are still responsible for all of the material covered in the missed session. Assignments associated with a missed laboratory session will not be accepted from students with unexcused absences. A student with unexcused absences from 2 or more lab sessions, a grade >50% of the combined average of both lab exams, or a grade >50% in the lab component of the course, will receive a maximum grade of D+.

**Late Assignment Policy:** Assignments must be completed **and** submitted before the designated time on each piece of graded work. Late assignments are not accepted unless alternate arrangements have been made with the lab coordinator **before** the due date/time (or within 48 hours for unforeseen circumstances). Only valid reasons for late assignment submissions will be accepted and will be considered on a case-by-case basis.

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

There are no scheduled out of class activities for this course.

Throughout the month of March (refer to the lab schedule below), students will complete a lab exercise that requires them to maintain cultures (incubation, storage, etc.) throughout the month-long exercise. Students will need to return to the lab outside of scheduled lab times to manage their cultures.

#### 6. **Course Materials:**

Recommended Textbook(s):

Madigan et al., *Brock Biology of Microorganisms, 16th Edition, eText* Pearson.

A laboratory jacket and safety glasses must be worn in the laboratory at all times (available at the bookstore)

Lecture notes outlines will be posted on D2L

The lab manual and lab assignments will be posted on D2L

In order to successfully engage in their 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/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

#### 7. **Examination Policy:**

No electronic or written aids (e.g., phones, tablets, computers, notes, textbooks) are allowed on tests or examinations. Non-programmable calculators will be permitted to answer quantitative questions on exams, if applicable, and permission to do so will be clearly indicated on the examination paper.

Working, and communicating, with any other individual during the exam is not allowed.

Students should also read the Calendar, [Section G](#), on Examinations.

#### 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.

#### 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 Services:** For more information, see their [website](#) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** 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 ([syasa@ucalgary.ca](mailto:syasa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.
- e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca), [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca),
- f. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Lisa Gieg by email [imgieg@ucalgary.ca](mailto:imgieg@ucalgary.ca) preferably 10 business days before the due date of an assessment or scheduled absence.

- g. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)  
[Student Academic Misconduct Policy](#) and [Procedure](#)  
[Faculty of Science Academic Misconduct Process](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- h. **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.
- i. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). 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.
- j. **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.

## Lecture Schedule

Date	Topic
January 9	Introduction to Microbiology PD
January 11	Microbiology History and Diversity PD
January 13	Microbial Ecosystems PD
January 16	Adaptation to Extreme Environments PD
January 18	Cell Structure I PD
January 20	Cell Structure II PD
January 23	Cell Structure III PD
January 25	Microbial Growth I PD
January 27	Microbial Growth II PD
January 30	Motility and Chemotaxis PD
February 1	Genomes/Genomics PD
February 3	Metabolism I PD
February 6	Metabolism II PD
<b>February 8</b>	<b>Midterm I (in-class, 50 minutes, Lectures 1-11) PD</b>
February 10	Metabolism III PD
February 13	Metabolism IV PD
February 15	Carbon and Nitrogen Cycles PD
February 17	Microbial Symbioses PD
February 20 - 24	Term Break - no lectures or labs
February 27	Basic Bacterial Genetics and Molecular Biology WH
March 1	Chromosomes, Plasmids, and Genetic Exchange WH
March 3	Mobile Genetic Elements WH
March 6	Viruses I WH
March 8	Viruses II WH
March 10	Viruses III WH
March 13	Microbial Communication - WH
<b>March 15</b>	<b>Midterm II (in-class, 50 minutes, Lectures 12-22) PD &amp; WH</b>
March 17	Microbiome WH
March 20	Pathogenesis I WH
March 22	Pathogenesis II WH
March 24	Pathogenesis III WH
March 27	Immunology I WH
March 29	Immunology II WH
March 31	Immunology III WH
April 3	Microbial Applications I WH
April 5	Microbial Applications II WH
April 12	Microbial Applications III WH

## Laboratory Schedule

Date	Exercise
January 10/12	LABORATORY 1
January 17/19	LABORATORY 2
January 24/26	LABORATORY 3
January 31/February 2	LABORATORY 4
February 7/9	LABORATORY 5
February 14/16	PRESENTATIONS
February 21/23	NO LABS (TERM BREAK)
February 28/March 2	LAB EXAM 1 & UNKNOWNNS
March 7/9	LABORATORY 6 & UNKNOWNNS
March 14/16	LABORATORY 7 & UNKNOWNNS
March 21/23	LABORATORY 8 & UNKNOWNNS

March 28/30	LAB EXAM 2
April 4/6	NO LABS

**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 - Dec 19 2022 10:30

---

**Department Approval**