BIOL2711: BIOLOGY OF MICROORGANISMS
COURSE SYLLABUS: WINTER 2026

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LECTURES: Monday and Wednesday 4:00-5:30pm in Braun Building BB2006

LABORATORY: You must enroll in one of the BIOL2711 Laboratory sessions. More information will be posted on the D2L lab pages near the beginning of the term; labs will start the 2nd week of the winter term.

COURSE DESCRIPTION: Microorganisms are the most abundant life on earth in numbers and play immense roles in virtually every aspect of the biosphere and humanity, very notably lately with the COVID-19 pandemic. This course addresses fundamentals of microbiology, with emphases on prokaryotic (bacteria and archaea) and eukaryotic (e.g. fungi, protozoa) microorganisms and viruses. Key topics include physiology, metabolism, genetics, microscopy, microbial cultivation, and host-microbe interactions. The final two weeks of the course lectures briefly introduce applied and environmental microbiology and infectious diseases, topics that can be explored further in upper-level Biology courses at Lakehead. The laboratory component of the course will give you hands-on experience using microscopy, cultivation, and biochemical tools to study a range of different microbes and issues in microbiology.

EXPECTED STUDENT COMMITMENT: In order to succeed in this course it is anticipated that beyond attending lectures and laboratory sessions you should spend approximately 3 to 4 hours per week on average to complete readings, prepare for laboratory sessions, and review materials as you study for the term test and final exam.

COURSE OBJECTIVES: After successfully completing this course, you will:

1) Be able to identify and explain key characteristics of the main groups of microorganisms.
2) Understand and be able to explain core concepts of microbial cell structure and function, microbial growth and physiology, and microbial genetics (and related evolution and systematics).
3) Be able to explain how microbes transform energy and matter that both relates to microbial growth and biochemical functioning as well as transformation of the surrounding environment.
4) Have gained a basic appreciation for the roles of microorganisms in the environment and industry and as agents of disease.
5) Have collected, analyzed, and interpreted data in the laboratory sessions to help meet objectives 1 through 4, and have learned basic, hands-on microscopy, aseptic technique, cell staining, microbial cultivation, and other approaches to characterize microorganisms.

USE OF D2L: Course information and announcements, lecture slides (pdf versions), links to lecture recordings, laboratory information and exercises, and marks will be posted on the D2L system. Please routinely check both the lecture and lab pages for BIOL2711.

TEXTBOOK: The textbook for this course is *Microbiology Third Edition* (Wiley Publishing, ISBN: SBN: 978-1-119-59240-2) by Dave Wessner, Christine Dupont, Trevor Charles, and Josh Neufeld. Although the course does generally follow the textbook, ***you will not be tested on material in the text that is not covered in lecture***. If you have a second edition of the text, it will also likely suffice (noting that some chapters have moved- e.g. "Metabolism" is chapter 13 instead of 6). The text can be purchased ($134.95) or rented ($57) here: https://www.wiley.com/en-ca/Microbiology,+3rd+Edition-p-9781119592495 among other venues like amazon.ca. ***Note that we will NOT use the Wiley-Plus features in this course (and please don't pay for it!).***

CLASSROOM POLLING: Classroom polling will occur at each class meeting. More instructions and information will follow in class, and participation points will not be tabulated until the 2nd class.

EVALUATION: Laboratory (30%); term test (25%); final exam (45%); lecture participation with clickers (up to 5%, and term-test or final exam will be down-weighted by up to 5%)

LECTURES: Attendance is not mandatory, but *material presented is the primary information* on which the term test and final exam will be based. If you respond to at least 80% of the in-lecture polling questions through the term, you will receive 5% of the course mark at full credit, and either your term test or your final exam will be down-weighted by 5%, whichever increases your final mark the greatest. If you respond to less than 80% of the questions, the polling marks will be reduced (e.g., if you answer 50% of the questions, you will receive 2.5% of the course mark at full credit). Polling will require a connected device with a camera to read QR codes and access to Google Forms Quizzes (the polling system) while you are logged in with your Lakehead U account. *Note:* it is an academic offence to participate in polling for any account other than your own.

LABORATORY ATTENDANCE AND PARTICIPATION: *Laboratory attendance and participation is mandatory*. *Closed-toed shoes* and long pants are required. Additional information about the laboratory will be available on the BIOL2711L laboratory D2L and covered during the first lab session (week of Jan 12).

MIDTERM TEST: The in-class midterm test will be held in class on Feb 23 and will primarily be drawn from lectures (but may also to a lesser extent draw from the laboratory exercises). *Material from the textbook that is not covered in class will not be on the test*. The test may include multiple-choice, true-false, fill-in-the-blank, and short-answer questions. For students with a legitimate documented absence due to a medical condition or other serious event who miss the term-test, the final exam will be re-weighted to 70%.

FINAL EXAM: The final exam will take place during the scheduled exam period (April 10-19, 2026) and cover material from the entire term; however more emphasis will be placed on material covered after the midterm test. *Material from the textbook that is not covered in class will not be on the exam.*

MISSED TERM WORK: Late laboratory assignments will be subject to a penalty of 10% per day of the total marks for the assignment. Assignments submitted seven calendar days beyond the due date will be assigned a grade of zero. Accommodation can be made when an assignment is late for legitimate University-verified reasons. There will be no re-writes or make-ups for the term test missed for university-accepted, verifiable reasons. Instead, the final exam will be re-weighted. Participation marks in laboratory sessions missed for university-accepted, verifiable reasons will be assigned based on reweighting of the sessions the student has attended. It is the student's responsibility to work with the instructors for missed lab sessions. A student who has missed work must inform the instructor as soon as possible to be considered for accommodation.

COMMUNICATION AND EMAIL POLICY: You are encouraged to ask questions in class and during office hours. If you have a course or other conflict with scheduled office hours, please contact the instructor to arrange a meeting at another time. All e-mails should be from a Lakehead University account, include BIOL2711 in the subject heading, and your full name in the text. I will typically respond within 24hrs.

ACADEMIC INTEGRITY/HONESTY OR ACADEMIC OFFENSES: It is your responsibility as a student at Lakehead University to familiarize yourself with, and adhere to the Code of Academic Integrity that addresses issues of academic dishonesty, among others: https://www.lakeheadu.ca/faculty-and-staff/departments/services/provost-vice-president-academic/academic-integrity-plans-policies

ACCESSIBILITY: Student Accessibility Services at Lakehead provides academic accommodations and services to students who have a physical, sensory, or learning disability, mental health condition, acquired brain injury, or chronic health condition, be it visible or hidden. For more information, please visit: https://www.lakeheadu.ca/students/student-life/student-services/accessibility

LECTURE SCHEDULE (SUBJECT TO CHANGE): Corresponding readings in parentheses are from Wessner, Dupont, Charles and Neufeld's text *Microbiology 3rd Edition* ***Please consult the lab schedule on the D2L BIOL2711L (Laboratory page) for further information on preparing for labs/lab-based evaluation work.***

January 5: **Introduction to microbiology**
January 7: **History lessons & the microbial world** (Chapter 1)
January 12: **The microbial world** (Chapter 1) **Bacteria** (Chapter 2)
January 14: **Bacteria** (Chapter 2)
January 19: **Bacteria** (Chapter 2
January 21: **Archaea** (Chapter 4)
January 26: **Eukaryal microorganisms** (Chapter 3)
January 28: **Eukaryal microorganisms** (Chapter 3)
February 2: **Viruses** (Chapter 5)
February 4: **Metabolism** (Chapter 6)
February 9: **Metabolism** (Chapter 6)
February 11: **Cultivating microorganisms** (Chapter 7)
February 16 & 18: Family Day and Winter Study Week (no classes)
February 23: ***Term test***
February 25: **Cultivating microorganisms** (Chapter 7)
March 2: **Microbial genetics and gene expression** (Chapters 8 and 12)
March 4: **Microbial genetics and gene expression** (Chapters 8 and 12
March 9: **Microbial genetics and gene expression and viral replication** (Chapters 8,9, and 11)
March 11: **Bacterial genetic analysis and genomics** (Chapters 10 and 11)
March 16: **Bacterial genetic analysis and genomics** (Chapters 10 and 11)
March 18: **Applied and environmental microbiology** (Chapters 13, 14, and 16)
March 23: **Applied and environmental microbiology** (Chapters 13, 14, and 16)
March 25: **Host-microbe interactions** (Chapter 15)
March 30: **Infectious diseases** (Chapter 18)
April 1: **Infectious diseases and course wrap-up** (Chapter 18)

*********Students are responsible for knowing the content of the syllabus*********