



Introduction to Microbiology - BIOL 200

University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE: September 2005
OUTLINE EFFECTIVE DATE: January 2023
COURSE OUTLINE REVIEW DATE: September 2028

GENERAL COURSE DESCRIPTION:

Introduction to Microbiology is an introduction to the general principles of microbiology. Lectures and laboratory exercises explore fundamental topics of microbiology, environmental microbiology and molecular microbiology such as diversity of microorganisms, microbial structure, metabolism, genetics and microbial ecology emphasizing applied, medical and environmental microbiology. The laboratory introduces methods for safe handling of microorganisms, techniques of microbial isolation, enumeration and identification as well as experiments relevant to lectures.

Program Information: This course is intended primarily for second-year university transfer students wishing to major or honour in biology or related fields.

Delivery: This course is delivered face-to-face

COTR Credits: 3

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	45
Practicum / Field Experience Hours	
Other Contact Hours	
Total	90

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	
Formal Work Experience	
Other	
Total	

Course Outline Author or Contact:

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Signature

APPROVAL SIGNATURES:

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Department Head Signature

Dean Signature

EDCO

Valid from: January 2023 – September 2028

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT

Prerequisites: BIOL 101

Corequisites: BIOL 102, if not taken previously

Flexible Assessment (FA):

Credit can be awarded for this course through FA

Yes No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit <http://www.cotr.bc.ca/Transfer>

Students should also contact an academic advisor at the institution where they want transfer credit.

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

J.M. Willey, L.M. Sherwood and C.J. Woolverton, *Prescott's Microbiology*, 12th ed., McGraw Hill Ryerson, 2022.

Please see the instructor's syllabus or check COTR's online text calculator <https://textbook.cotr.bc.ca/> for a complete list of the currently required textbooks.

LEARNING OUTCOMES:

Upon the successful completion of this course, students will be able to:

- Recognize microbial ubiquity and the diversity of ecosystems in which microorganisms are found;
- Explain how most bacteria in nature live in biofilm communities interacting with modifying and being modified by their environment;
- Describe how microorganisms interact with both human and non-human hosts in beneficial, neutral, or detrimental ways;
- Explain how life and the processes that support life (biogeochemical cycles, plant and animal microbiota) are dependant on microorganisms;
- Discuss microorganisms as models that provide important knowledge about life processes;
- Identify how humans utilize and harness microbes and their products.
- Outline how cells, organelles, and all major metabolic pathways evolved from early prokaryotic cells;
- Describe basic structural features, metabolism, growth and genetics of bacteria, viruses and eukaryotic microorganisms;
- Discuss the importance of microscopy to our current understanding of the structure and function of microorganisms;
- Explain how mutations, horizontal gene transfer and variety of environments has selected for an enormous diversity of microorganisms;
- Illustrate how human impact influences the evolution of microorganisms (e.g., emerging diseases and the selection of antibiotic resistance).
- Describe and evaluate physical, chemical, biological and mechanical means of controlling microbial growth and describe unique bacterial cell structures that can be targets for antibiotics and immunity;
- Describe the replication cycles of viruses;
- Use specific examples to demonstrate the extensive metabolic diversity in Bacteria and Archaea and explain how survival and growth of any microorganism depends on its metabolic characteristics;
- Discuss how the interactions of microorganisms among themselves and with their environment are determined by their metabolic abilities and how genetic variations can impact microbial functions (e.g., in biofilm formation, pathogenicity, and drug resistance).
- Demonstrate a working knowledge of equipment, PPE and safety practices required for working in a containment level 2 laboratory;

- Demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills;
- Apply scientific method to collect, interpret and present scientific data in microbiology;

COURSE TOPICS:

- Introduction, Microorganisms, Microbiology, History & Scope
- Microscopy
- Microbial Cell Structure and Function
- Microbial Nutrition
- Metabolism (and Regulation)
- Microbial Growth and Reproduction
- Control of Microorganisms
- Genetics
- Viruses
- Microbial Diversity, Evolution and Systematics
- Microbial Ecology / Microbial Associations
- Disease / Infection / Infectious Diseases
- Immunology
- Industrial, Food, Forensic and Environmental Microbiology

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

EVALUATION AND ASSESSMENT (Face to Face Delivery)

Assignments	% Of Total Grade
Lecture	
Assignments	10 %
Term Tests	30 %
Final Exam	30 %
Laboratory	
Assignments and Laboratory Book	10 %
Laboratory Reports	10 %
Laboratory Exam	<u>10 %</u>
Total	100%

Please see the instructor's syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments, and use of electronic aids.

In order to pass the course, a passing grade (50% or greater) is required in each of the laboratory portion and lecture portion of the course.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment, and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.