



Introduction to Microbiology - BIOL 200

University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE: September 2005
OUTLINE EFFECTIVE DATE: January 2017
COURSE OUTLINE REVIEW DATE: September 2022

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:

Andrena Heigh, MSc.

Signature

APPROVAL SIGNATURES:

Department Head
Erin Aasland Hall
E-mail: aaslandhall@cotr.bc.ca

Dean of Business and University Studies
Darrell Bethune
E-mail: bethune@cotr.bc.ca

Department Head Signature

Dean Signature

EDCO

Valid from: January 2017 – September 2022

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*, 10th ed., McGraw Hill Ryerson, 2016.

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

LEARNING OUTCOMES:

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

- state which prokaryotic and eukaryotic organisms are classified as microorganisms and describe the historical development of microbiology as a science;
- understand microbial diversity and evolution;
- have a working understanding of bright field microscopy, oil immersion microscopy, phase contrast microscopy and staining techniques used in identification of microorganisms;
- describe the structural components of microorganisms and the functions of these components;
- classify microorganisms as archaea, bacteria, viruses, fungi or protozoa;
- describe structures and processes used to exchange nutrients, wastes and secreted compounds between the organism and its environment;
- use different types of culture media appropriately;
- understand and use aseptic techniques associated with production and maintenance of pure cultures;
- describe the pathways of glucose degradation used by microorganisms;
- discuss the routes of ATP production through the processes of anaerobic respiration, aerobic respiration and fermentation;
- describe the process of cell division and relate this process to the growth of bacterial populations;
- quantitatively determine the growth rate of colonies;
- describe environmental influences on growth and classify organisms based on their growth environments;
- describe various methods of controlling populations of microorganisms and their relative effectiveness;
- describe the modes of transmission and infection used by microbes;
- discuss the mechanisms leading to resistance to anti-microbial agents;
- distinguish between innate and acquired immunity;
- discuss the barriers and mechanisms that protect human body from invasion;
- distinguish the types of antibiotics and explain their modes of action;
- describe the general properties of viruses, modes of viral replication and their roles in disease;
- describe the structure and function of bacterial genomes in gene expression and regulation;
- explain the mechanisms of genetic recombination;
- provide examples of symbiotic relationships involving bacteria;
- describe types of interactions - symbiotic (mutualism and commensalism), predation, parasitism and amensalism; and

- discuss the importance/relevance of microorganisms in the production of food and nutrients for humans, bioremediation and agriculture.

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.