



BIOL-101 – Introduction to Biology 1

University Arts and Science

Effective Term & Year: Fall 2022
Course Outline Review Date: 2026-09-01

Program Area: Math and Sciences

Description:

This course is an introduction to the structure and function of organisms with particular reference to molecular, biochemical and physiological aspects of the living world. Designed for students seeking a degree or diploma in a field of science or technology, BIOL 101, with BIOL 102, lays the foundations on which the higher-level courses in Biology are based. It is also suitable as an elective course for general interest or arts students.

Program Information:

BIOL 101 and BIOL 102 can be used as lab science courses in an Associate of Arts or an Associate of Science degree at COTR.

Delivery Methods: On-campus (Face-to-Face)

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Sciences, Lab Sciences

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	45
Practicum/Field Experience	

Co-op/Work Experience	
Other	
Total	90

Course Requisites:

- Complete 1 of the following
 - Completed at least 1 of the following:
 - **ATPH 12** – Anatomy and Physiology 12
 - **BIOL090** – Biology-Provincial Level (Human Biology) (3)
 - Life Sciences 11 and Chemistry 12 are highly recommended.

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see <https://www.bctransferguide.ca/> or <https://transferalberta.alberta.ca> . For more transfer credit information, please visit <https://www.cotr.bc.ca/Transfer>

All requests for course transfer credit from institutions in British Columbia or elsewhere should go to the College of the Rockies Enrolment Services office.

Textbook 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:

Raven P, Johnson G, Mason K, and Losos J. 2017. *Biology*. 12th ed. McGraw Hill.

Biology 101 Lab Packet (available at the COTR bookstore)

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:

- Conduct basic research and present results using established scientific research methods, including use of relevant databases, interpretation of scientific/technical information, and proper citation techniques;
- Evaluate, validate and discuss research results in a professional manner that adheres to discipline specific processes;
- Recognize and describe the role that biology plays in everyday life;
- Demonstrate knowledge of and follow the steps of the scientific process;
- Demonstrate a basic knowledge of taxonomic groups, origin of species and diversity within each of the taxonomic groups;
- Explain relationships (structural/functional) at cellular and organismal levels of organization;
- Classify and describe the unique structure and function of the four groups of macromolecules and how it is related to their properties within cells;
- Demonstrate a basic understanding of chemical bonds, molecules, compounds and reactions common in living systems;
- Explain the unique properties of water that allow it to support life;
- Demonstrate an understanding of general biochemistry and metabolism in cells;
- Explain the importance of energy transformations and energy coupling in living systems;
- Demonstrate an understanding of general structure and function of the cell and the organelles within cells;
- Demonstrate an understanding of the structure and function of membranes, various mechanisms of transport used to move molecules across cell membranes;
- Outline cellular respiration and photosynthesis pathways and explain why these processes are important to living organisms;
- Describe and explain the role of growth regulators in the control of plant growth, development and physiology;
- Demonstrate an understanding of physiological divisions of tissues and cell types, organ functioning and organ systems in plants and animals, and mechanisms of homeostasis in animals;
- Explain evolutionary relationships among major taxa;
- Recognize and explain challenges of life on land in both plants and animals;
- Demonstrate working knowledge of standard laboratory practices, procedures and safety protocols, including proper use of equipment; observation, measurement and sampling techniques; recording, statistical analysis and presentation of data;
- Identify types of cells from different taxonomic groups;
- Demonstrate correct procedures of microscopy (compound and stereo microscopes). Prepare wet mount slides with live organisms; and
- Conduct experiments and use analytical techniques to demonstrate properties of macromolecules, cellular respiration, photosynthesis, plant control systems.

Course Topics:

Introduction and Scientific Experimentation

- Diversity of life – overview of taxonomic groups and the origin of species, unifying characteristics and basic knowledge of the diversity within each of the taxonomic groups
- The Scientific Method
- What defines a living organism
- Unifying themes in biology

Chemical Basis of Life and Basic Biochemistry

- Chemistry of water – unique properties of water that allow it to support life
- Biological molecules – structure, function, formation and basic chemical formulas (Proteins, nucleic acids, carbohydrates, lipids)
- Enzymes (functions and mechanisms of action)
- Energy and metabolism (anabolic and catabolic pathways, significance of ATP)

Cell Biology

- Cell structure and function
- Membranes and Cell Physiology
- Metabolism and enzymes
- Location and processes of cellular respiration
- Cellular Respiration

Plant Biology

- Location and processes of photosynthesis
- Plant evolution – evolutionary patterns from non-vascular to seedless vascular to seed plants; evolution and adaptations in angiosperms
- Challenges of life on land
- Plant form and function
- Plant nutrition and transport processes
- Plant hormones and sensory systems
- Plant reproduction and development

Animal Biology – Evolutionary patterns in animals how various organisms accomplish:

- Body and regulation
- Nutrition and digestion
- Musculoskeletal systems (support and movement)

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

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face)

Assessment Type	% of Total Grade
Lab Assignments and Activities	37%
Midterms	35%
Final Exam	28%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

Pass requirements: None

Evaluation Notes: A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

Evaluation Notes Comments:

Notes: Retests for failed exams are not available in this course.

Late assignments are penalized by 10% per each 24-hour period.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at <https://cotr.bc.ca/about-us/college-policies/> and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.