



COLLEGE OF  
THE ROCKIES

## BIOL-102 – Introduction to Biology 2

University Arts and Science

**Effective Term & Year:** Fall 2022

**Course Outline Review Date:** 2026-09-01

**Program Area:** Math and Sciences

### Description:

BIOL 102 is an introduction to organismic and population biology with emphasis on reproduction, genetics, developmental biology, evolution, diversity and ecology.

### Program Information:

BIOL 101 AND BIOL 102 can be used as components of an Associate of Arts (AA) or an Associate of Science (ASc) degree at COTR.

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

**Credit Type:** College of the Rockies Credits

**Credits:** 3

**Course type/s:** Lab Sciences, 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   |       |

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|       |    |
|-------|----|
| Total | 90 |
|-------|----|

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**Course Requisites:**

- Completed the following:
  - **BIOL101** – Introduction to Biology 1 (3)

**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.

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**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.

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**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, Johnson, Mason, Losos and Singer. 2016. *Biology*. 12th Edition. The McGraw Hill Companies Ltd.

Biology 102 Lab Outlines and Worksheets

*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.*

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## Learning Outcomes:

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

- 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;
- Describe and explain the diversity of control mechanisms in animal systems including the role of endocrine and nervous systems;
- Describe and explain the processes and steps involved in cellular division in plants and animals including how mitosis and meiosis is important to growth, development and reproduction;
- Describe the steps of DNA replication and its function in the cell division and inheritance;
- Demonstrate knowledge of the genetic code, the basic steps of gene expression and be able to explain the roles of DNA, mRNA, tRNA, rRNA, amino acids and proteins in transcription and translation;
- Explain how genes interact with the environment, the role of mutations, meiosis and fertilization in changing the genetic compositions of populations over time;
- Demonstrate an understanding of mechanisms of inheritance of genetic traits, basic principles of mendelian genetics;
- Understand and explain the relationship between genetics and evolution;
- Be able to discuss mechanisms of evolution and apply evolutionary concepts;
- Demonstrate understanding of the relationship between biotic and abiotic components of the biosphere, their interactions and relationship to evolution;
- Understand and explain evolutionary relationships among major taxa;
- 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 evaluation of data;
- Identify types of cells from different taxonomic groups;
- Analyze and solve problems involving mendelian and non-mendelian inheritance;
- Analyze and interpret experimental data; and
- Conduct experiments and use analytical techniques to demonstrate animal control systems.

Note: Biology 101 and 102 together constitute a first year, university level, general biology course designed primarily to lay the groundwork for further studies in the sciences.

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## Course Topics:

### Basic methodology of scientific thought and communication

### Evolutionary patterns in animals how various organisms accomplish:

- Circulation of gases fluids and materials
- Gas exchange

- Osmoregulation and excretion of wastes
- Nervous systems
- Endocrine systems
- Reproductive systems
- Immune systems
- Developmental biology

## Cell cycle and cell replication including mitosis and meiosis

### Genetics

- Mendelian inheritance (theory and problems)
- Non-mendelian inheritance (incomplete dominance, co-dominance, linkage, epistasis, multiple alleles, sex linkage, extranuclear and multigenic inheritance)
- Molecular genetics (replication, transcription, translation)
- Genomics and Biotechnology
- Population genetics, application of Hardy – Weinberg equilibrium

### Theory of evolution and diversity of life

- Taxonomic groups and the origin of species – unifying characteristics and knowledge of diversity within each of the taxonomic groups
- Darwin and natural selection
- Major patterns of evolution
- History of life
- Microevolution – causes of evolutionary change and microevolutionary patterns
- Macroevolution – patterns of change in phenotype resulting from natural selection

### Ecological principles

- Hierarchy and new properties that emerge at each level
- Population ecology
- Community ecology
- Ecosystems

*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 Exam        | 14%              |
| Lab Assignments | 21%              |
| Midterms        | 37%              |
| 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.

#### **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.