



## Introduction to Biology 2 - BIOL 102

University Studies Program

### Course Outline

COURSE IMPLEMENTATION DATE: Pre 1998  
OUTLINE EFFECTIVE DATE: January 2021  
COURSE OUTLINE REVIEW DATE: September 2026

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#### GENERAL COURSE DESCRIPTION:

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

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**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.

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**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	
<b>Total</b>	90

#### Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
<b>Total</b>	

**Course Outline Author or Contact:**

Andrena Heigh, B.Sc., M.Sc.

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Signature

**APPROVAL SIGNATURES:**

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Department Head Signature

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Dean Signature

EDCO

Valid from: January 2021 – September 2026

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Education Council Approval Date

**COURSE PREREQUISITES AND TRANSFER CREDIT:**

**Prerequisites:** BIOL 101

**Corequisites:** None

**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.

**Prior Course Number:** N/A

## 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:

Raven, Johnson, Mason, Losos and Singer. 2016. *Biology*. 12<sup>th</sup> 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*

<http://go.cotr.bc.ca/tuition/tCalc.asp> 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.*

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## EVALUATION AND ASSESSMENT:

Assignments	% Of total Grade
Lab Exam	14%
Lab Assignments	21%
Midterms	37%
Final Exam	<u>28%</u>
Total	100%

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

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## 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.

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## 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.

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## ACADEMIC POLICIES:

See [www.cotr.bc.ca/policies](http://www.cotr.bc.ca/policies) for general college policies related to course activities, including grade appeals, cheating and plagiarism.

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## 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 will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.