





Biology (BIOL) 401

Cell Biology (Revision 6)

Status:

Replaced with new revision, see the [course listing](#)  for the current revision 

Delivery mode:

Individualized study online 

Credits:

3

Area of study:

Science

Prerequisites:

BIOL 204 and **BIOL 205** OR **BIOL 204** and **BIOL 207** or equivalent.

Precluded:

None

Challenge:

BIOL 401 has a challenge for credit option.

Faculty:

[Faculty of Science and Technology](#) 

Overview

BIOL 401 focuses on essential principles and processes in cell biology and integrates these in the context of molecular biology. This senior-level course considers cell structure and function, bioenergetics, membranes, molecular genetics, and intercellular signalling.

Outline

- Unit 1: Cells and Organelles
- Unit 2: Membrane Structure and Function
- Unit 3: Cell Communication and Signal Transduction
- Unit 4: Bioenergetics and Enzymes
- Unit 5: Glycolysis, Fermentation, Gluconeogenesis, and the TCA Cycle
- Unit 6: Electron Transport, Oxidative Phosphorylation, and Photosynthesis
- Unit 7: DNA Structure, Replication, and Repair
- Unit 8: Transcription and RNA Processing
- Unit 9: The Genetic Code and Protein Synthesis
- Unit 10: Gene Regulation and Epigenetic Inheritance
- Unit 11: The Cytoskeleton and Cell Motility
- Unit 12: Cell Division and the Cell Cycle

Learning outcomes



Upon successful completion of this course, you should be able to

- identify cellular structures and their functions for prokaryotic and eukaryotic cells.
- discuss the metabolic processes of cells and their importance in energy generation and synthesis of cellular building blocks.
- describe the structure of DNA and explain the processes of DNA replication, transcription, and translation.
- outline the processes of cell division and cell death and their role in

genetic diversity and disease.

- articulate the components of the cytoskeleton and outline their role in cell motility and muscle contraction.
- conduct literature searches and read journal publications in cell biology to write an essay and participate in discussions on topics relevant to cell biology.
- apply knowledge of cell biology processes to evaluate topics related to health and disease.

Evaluation

To **receive credit**  for BIOL 401, you must achieve a course composite grade of at least **D (50 percent)** , and a grade of at least 50 percent on each of the course assignments, the midterm examination, and the final examination. The weighting of the composite grade is as follows:

| Activity | Weight |
|----------------------|-------------|
| Assignment 1 | 10% |
| Assignment 2 | 10% |
| Assignment 3 (Essay) | 20% |
| Midterm Online Exam | 30% |
| Final Online Exam | 30% |
| Total | 100% |

The **midterm and final examinations** for this course must be requested in advance and written under the supervision of an AU-approved exam invigilator. Invigilators include either ProctorU or an approved in-person invigilation centre that can accommodate online exams. Students are responsible for payment of any invigilation fees. Information on exam request deadlines, invigilators, and other exam-related questions, can be found at the

Exams and grades [↗](#) section of the Calendar.

To learn more about assignments and examinations, please refer to Athabasca University's **online Calendar** [↗](#).

Materials

This course either does not have a course package or the textbooks are open-source material and available to students at no cost. This course has a **Course Administration and Technology Fee** [↗](#), but students are not charged the Course Materials Fee.

Bergtrom, G. (2016). *Cell and Molecular Biology: What We Know & How We Found Out*, 2nd edition. An Annotated Creative Commons (Open Access) iText [↗](#) (Online)

Challenge for credit

Overview

The challenge for credit process allows you to demonstrate that you have acquired a command of the general subject matter, knowledge, intellectual and/or other skills that would normally be found in a university-level course.

Full information about **challenge for credit** [↗](#) can be found in the Undergraduate Calendar.




Evaluation

To **receive credit** [↗](#) for the BIOL 401 challenge registration, you must achieve an overall grade of at least **D (50 percent)** [↗](#) on the examination.

[📎](#) **Challenge for credit course registration form**

Important links

› **Academic advising** [↗](#)

- › [Program planning](#) 
- › [Request assistance](#) 
- › [Support services](#) 

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

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View [previous revision](#) 
