



Biology (BIOL) 625

Bioinformatics and Genomics (Revision 1)

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: None

Precluded: None

Faculty:**Faculty of Science and Technology** [↗](#)**Notes:**

To take this graduate-level course, you must apply and be approved to one of the graduate programs or as a non-program **Centre for Science** [↗](#) graduate student. Minimum admission requirements must be met. Undergraduate students who do not meet the admission requirements will not normally be permitted to take this course.

Overview

Applied bioinformatics is an interdisciplinary field that deals with applying computational tools for processing, analyzing, and interpreting biological data. This course is designed to teach the underlying concepts of bioinformatics tools and their algorithms and apply them to carry out biologically meaningful analyses. The course will merge theory with practical, hands-on analyses for an experientially trained bioinformatician.

Outline

- Unit 1: Biological Information: Storage and Flow
- Unit 2: DNA and RNA Sequencing Technology



- Unit 3: Comparing Biological Sequences
- Unit 4: Phylogeny and Evolution
- Unit 5: Genomics and Genome Assembly
- Unit 6: Genes: Prediction and Annotation
- Unit 7: Metagenomics
- Unit 8: Transcriptomics

Learning outcomes

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

- explain the objectives and principles of bioinformatics data analysis.
- learn and apply specific subfields of bioinformatics.
- recognize the caveats and issues, and work around them.
- design a bioinformatics workflow for analyzing and understanding biological data.
- conduct bioinformatics data analysis to address a real-life biological question.

Evaluation

To **receive credit**  for BIOL 625, you must achieve a course composite grade of at least **B- (70 percent)**  and a grade of at least 50 percent on each assignment and the final project.

The weighting of the composite grade is as follows:

Activity	Weight
Explore More Activities (Top 5 scoring)	25%
Quizzes (Top 5 scoring)	25%
Assignment 1: Project Proposal	10%
Assignment 2: Initial Project Submission	25%
Assignment 3: Final Project: Revised Submission	15%
Bonus Credit: Manuscript-style Submission	(5%)
Total	100%

Materials





Digital course materials

Links to the following course materials will be made available in the course:

Kellis, M. (Ed.). (2016). *Computational biology: Genomes, networks, evolution*. MIT OpenCourseWare.

Hendrix, D. A. (2019). *Applied bioinformatics of nucleic acid sequences* (1st ed.). Oregon State University.

Important links

- › [Academic advising](#) 
- › [Program planning](#) 
- › [Request assistance](#) 
- › [Support services at AU](#) 

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

Opened in Revision 1, September 26, 2025

Updated June 10, 2026