UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: January 2008
REVISED COURSE IMPLEMENTATION DATE: September 2016
COURSE TO BE REVIEWED: (six years after UEC approval) December 2021
Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: BIO 414	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: Genomics **Course Short Title (if title exceeds 30 characters):**	
Faculty: Faculty of Science	**Department (or program if no department):** Biology

Calendar Description:

This course examines how genetic information is encoded, ordered, and expressed in whole organisms. Methods for obtaining, assembling, and annotating genomic sequences are explored. Students gain hands-on computer experience using various bioinformatics tools to handle and interpret genomic sequence data.

Note: This course is offered as BIO 414 and BIOS 414. Students may take only one of these for credit.

Prerequisites (or NONE):	BIO 201, BIO 202, and BIO 220.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Equivalent Courses (cannot be taken for additional credit)
Former course code/number:
Cross-listed with: BIOC 414
Equivalent course(s): **BIOC 414**
Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit
Transfer credit already exists: ☐ Yes ☒ No
Transfer credit requested (OReg to submit to BCCAT):
☐ Yes ☒ No (if yes, fill in transfer credit form)
Resubmit revised outline for articulation: ☐ Yes ☒ No
To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 45
Typical structure of instructional hours:

Lecture hours	25
Seminars/tutorials/workshops	20
Laboratory hours	
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**45**

Special Topics
Will the course be offered with different topics?
☐ Yes ☒ No
If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s) ☐ Yes, no limit
Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 24

Expected frequency of course offerings (every semester, annually, every other year, etc.): annually

Department / Program Head or Director: Allan Arndt	**Date approved:**	October 16, 2015
Faculty Council approval	**Date approved:**	November 6, 2015
Campus-Wide Consultation (CWC)	**Date of posting:**	December 11, 2015
Dean/Associate VP: Lucy Lee	**Date approved:**	November 6, 2015
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	December 18, 2015

Learning Outcomes

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

1) Compare various methods used in the sequencing of DNA
2) Examine the challenges and strategies associated with the sequencing of whole genomes
3) Evaluate a contiguous sequence of genomic DNA using gene annotation and comparative genomics
4) Devise methods and strategies for searching and mapping molecular databases
5) Describe the use of microarrays for examining proteomes and transcriptomes
6) Explain how changes in the metabolic signatures of cells can lead to greater understanding of cell function
7) Thoroughly explain genomics and its applications in modern biological research

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

Lectures, in-class discussions, sequence retrieval and analysis and other computer-based assignments, presentations.

Grading system: Letter Grades: ☒ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☒

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	A. Lesk	Introduction to Genomics, 2nd ed.	☒	Oxford Univ. Press	2012
2.			☐		
3.			☐		
4.			☐		
5.			☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

Part of the course would need to be offered in a computer lab.

Typical Evaluation Methods and Weighting

Final exam:	40 %	Assignments:	15 %	Midterm exam:	20 %	Practicum:	%
Quizzes/tests:	%	Lab work:	%	Field experience:	%	Shop work:	%
Term paper:	15 %	Oral presentation:	10 %	Other:	%	Total:	0%

Details (if necessary):

Typical Course Content and Topics

Week 1 - 2 Introduction to genomics and genomic research
Week 3 - 5 Mapping, sequencing, annotation, and databases
Week 6 - 7 Comparative genomics
Week 8 Evolution and genomic change
Week 9 Microarrays and transcriptomics
Week 10 Proteomics
Week 11 Metabolomics
Week 12 - 13 Presentations