UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: October 1994
REVISED COURSE IMPLEMENTATION DATE: September 2020
COURSE TO BE REVIEWED (six years after UEC approval)**:** March 2026
Course outline form version: 05/18/2018

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

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

Course Code and Number: BIO 220	**Number of Credits:** 4 Course credit policy (105)

Course Full Title: Genetics
Course Short Title:
(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)

Faculty: Faculty of Science	**Department (or program if no department):** Biology

Calendar Description:

Introductory genetics course dealing with the principles and concepts of transmission of genetic information in all living organisms. The function of a gene will be studied at the molecular level.

Prerequisites (or NONE):	One of the following: (BIO 112 and CHEM 114, both with a C+ or better) or (BIO 111, [CHEM 110 or CHEM 113], and [two of AGRI 123, AGRI 124, AGRI 129, AGRI 163, AGRI 203, AGRI 204, or AGRI 220], all with a C+ or better).
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Antirequisite Courses *(Cannot be taken for additional credit.)*
Former course code/number:
Cross-listed with:
Dual-listed with:
Equivalent course(s):
(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar hours	45
Tutorials/workshops	
Supervised laboratory hours	45
Experiential (field experience, practicum, internship, etc.)	
Supervised online activities	
Other contact hours:	
Total hours	**90**

Labs to be scheduled independent of lecture hours: ☐ No ☒ Yes

Special Topics *(Double-click on boxes to select.)*
This course is offered with different topics:
☒ No ☐ Yes *(If yes, topic will be recorded when offered.)*

Independent Study
If offered as an Independent Study course, this course may be repeated for further credit: *(If yes, topic will be recorded.)*
☒ No ☐ Yes, repeat(s) ☐ Yes, no limit

Transfer Credit
Transfer credit already exists: *(See bctransferguide.ca.)*
☐ No ☒ Yes
Submit outline for (re)articulation:
☒ No ☐ Yes *(If yes, fill in transfer credit form.)*

Grading System
☒ Letter Grades ☐ Credit/No Credit

Maximum enrolment (for information only): 24

Expected Frequency of Course Offerings:
Every semester *(Every semester, Fall only, annually, etc.)*

Department / Program Head or Director: Anthony Stea	**Date approved:**	December 2019
Faculty Council approval	**Date approved:**	January 10, 2020
Dean/Associate VP: Lucy Lee	**Date approved:**	January 10, 2020
Campus-Wide Consultation (CWC)	**Date of posting:**	March 20, 2020
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	April 24, 2020

Learning Outcomes:

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

a) Develop a detailed understanding of core concepts in genetics such as Mendel's laws, Meiosis mechanisms, and Genomics.

b) Calculate genetic distances along chromosomes and generate restriction enzyme maps

c) Analyze and interpret experimental data in order to deduce modes of inheritance and predict outcomes of genetic crosses.

d) Work collaboratively in small groups in a genetics laboratory setting. This will entail dividing the experimental work so that each member of the group plays a critical role in the completion of the experiment and the gathering and analysis of the data.

e) Engage in hypothesis testing and experimentation using biological equipment (e.g. micropippettors, electrophoresis equipment, PCR thermocyclers, etc.).

f) Use mathematical, statistical, and/or graphical analysis of experimental data to compare results to theoretical predictions.

g) Write lab reports and/or assignments summarizing experimental work and determining biological significance.

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.)*

The basic genetic principles will be taught in lectures. Practical experience will be gained through laboratory exercises and assignments.

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.	Klug/Cummings	Concepts in Genetics	☒	Pearson	2019
2.			☐		
3.			☐		
4.			☐		
5.			☐		

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

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	%	Field experience:	%	Portfolio:	%
Midterm exam:	30%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests:	10%	Lab work:	20%	Shop work:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

The major topics included in this course:

1. Basic Mendalian Genetics
2. Meiosis
3. Mapping genes on eukaryotic, bacterial and viral chromosomes and basic cytogenetics
4. DNA structure and genomics
5. Cloning and sequencing
6. Biotechnology, genetic engineering, and gene therapy
7. Control of gene expression in prokaryotes and eukaryotes

Laboratory Experiments:

- Lab 1: Gene Mapping
- Lab 2: Mutagenesis
- Lab 3: Genomics
- Lab 4: DNA Isolation and Quantification
- Lab 5: Transformation and Restriction Enzyme Mapping
- Lab 6: RFLP Analysis and PCR Amplification