UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 1992
REVISED COURSE IMPLEMENTATION DATE: September 2016
COURSE TO BE REVIEWED: (six years after UEC approval) February 2022
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 401	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: Molecular Biology **Course Short Title (if title exceeds 30 characters):**	
Faculty: Faculty of Science	**Department (or program if no department):** Biology

Calendar Description:

A study of the techniques employed in molecular biology to study advanced problems and concepts such as gene expression, cell organization, cell function, and the control of cell division and growth. Students will be required to participate in class seminars designed to analyze the recent scientific literature on topics related to the molecular biology of cells.

Prerequisites (or NONE):	One of the following: BIO 304, BIO 312, BIO 320 or BIO 325. Note: As of January 2017, prerequisites will change to the following: 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:

Equivalent course(s):

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	39
Seminars/tutorials/workshops	6
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 30, 2015
Faculty Council approval	**Date approved:**	December 4, 2015
Campus-Wide Consultation (CWC)	**Date of posting:**	January 22, 2016
Dean/Associate VP: Lucy Lee	**Date approved:**	November 20, 2015
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	February 26, 2016

Learning Outcomes

Upon successful completion of this course, students will be able

- Discuss important historical advances in the field of molecular biology
- Explain procedures used in molecular biology and how altering variables within protocols can change the expected outcomes
- Assess pcr primer quality and calculate annealing temperatures
- Annotate sequences with information regarding expression
- Design experiments employing molecular techniques discussed in class
- Describe molecular details of certain biological functions including cell division, sex determination, and development
- Discuss the molecular basis of both human and non-human disease states and how molecular biology has contributed to these

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)

Lecture, demonstration, small group practice, discussion, audio-visual presentation, use of models and charts.

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.	Clark, D., and Pazdernik N.	Molecular Biology	☒	Garland	1994

Typical Evaluation Methods and Weighting

Final exam:	%	Assignments:	10%	Midterm exam	30%	Practicum:	%
Seminar Final:	20%	Lecture Final:	40%	Other:	%	Total:	100%

Typical Course Content and Topics

Part I: Introduction
- chemical principles
- macromolecules

Part II: Molecular Methods
- PCR and primer design
- Blotting and hybridization
- Restriction enzymes and cloning
- Microarrays
- Fluorescence and mapping
- DNA Sequence manipulation
- Diversity in gene expression
- mRNA positioning and processing
- Protein purification
- Protein interactions
- Transgenic expression
- Cellular imaging

Part III: Function
- transport across membranes
- cytoskeleton
- control of cell division and growth
- determination and differentiation
- chemical signaling
- energy production
- photosynthesis

Part IV: Student Seminars
- weekly student seminar presentations
- analysis of seminar material

Laboratory Experiments: Not required for this course