UNIVERSITY OF THE FRASER VALLEY

**ORIGINAL COURSE IMPLEMENTATION DATE:** September 1992
**REVISED COURSE IMPLEMENTATION DATE:** September 2022
**COURSE TO BE REVIEWED** (six years after UEC approval)**:** January 2028
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 401 | **Number of Credits:** 3 Course credit policy (105) |

**Course Full Title:** Molecular Biology
**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:**

A study of the techniques employed in molecular biology covering concepts such as gene expression, cell organization, cell function, and the control of cell division and growth. Incudes analysis of classic and current scientific literature.

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|---|---|
| **Prerequisites (or NONE):** | BIO 201, BIO 202, and BIO 220. |
| **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**

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|---|---|
| Lecture/seminar hours | 39 |
| Tutorials/workshops | 6 |
| Supervised laboratory hours | |
| Experiential (field experience, practicum, internship, etc.) | |
| Supervised online activities | |
| Other contact hours: | |
| **Total hours** | **45** |

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:**
Annually *(Every semester, Fall only, annually, etc.)*

| | |
|---|---|
| **Department / Program Head or Director:** Gregory Schmaltz | **Date of meeting:** October 1, 2021 |
| **Faculty Council approval** | **Date of meeting:** November 5, 2021 |
| **Undergraduate Education Committee (UEC) approval** | **Date of meeting:** January 28, 2022 |

**Learning Outcomes:**

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

1. Discuss important historical advances in the field of molecular biology.
2. Explain procedures used in molecular biology and how altering variables within protocols can change the expected outcomes.
3. Design experiments employing molecular techniques discussed in class.
4. Analyze original research papers.
5. Describe molecular details of certain biological functions including DNA replication, DNA modification and transcription. .
6. Communicate orally and in writing current findings in molecular biology.

**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, in-class discussions, student presentations.

**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.** | Alberts et al. | Molecular Biology of the Cell | ☒ | Norton | 2014 |
| **2.** | | | ☐ | | |
| **3.** | | | ☐ | | |
| **4.** | | | ☐ | | |
| **5.** | | | ☐ | | |

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

**Typical Evaluation Methods and Weighting**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lecture Final exam: | 40% | Assignments: | 30% | Field experience: | % | Portfolio: | % |
| Midterm exam: | 30% | Project: | % | Practicum: | % | Seminar Final: | % |
| Quizzes/tests: | % | Lab work: | % | Shop work: | % | Total: | 100% |

**Details (if necessary):**

**Typical Course Content and Topics**

**Introduction**

- Chemical principles
- Macromolecules

**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

**Seminars**

- Weekly seminar discussions
- Student presentations