**ORIGINAL COURSE IMPLEMENTATION DATE:** October 1994
**REVISED COURSE IMPLEMENTATION DATE:** January 2018
**COURSE TO BE REVIEWED: (six years after UEC approval)** December 2020
**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 220 | **Number of Credits:** 4 Course credit policy (105) |
| **Course Full Title:** Genetics<br>**Course Short Title (if title exceeds 30 characters):** | |
| **Faculty:** Faculty of Science | **Department (or program if no department):** Biology |

**Calendar Description:**

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

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|---|---|
| **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 the following: 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):** | |

**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: 90**

**Typical structure of instructional hours:**

| | |
|---|---|
| Lecture hours | 45 |
| Seminars/tutorials/workshops | |
| Laboratory hours | 45 |
| Field experience hours | |
| Experiential (practicum, internship, etc.) | |
| Online learning activities | |
| Other contact hours: | |
| **Total** | **90** |

**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.):** every semester

| | | |
|---|---|---|
| **Department / Program Head or Director:** Allan Arndt | **Date approved:** | November 25, 2016 |
| **Faculty Council approval** | **Date approved:** | January 6, 2017 |
| **Campus-Wide Consultation (CWC)** | **Date of posting:** | March 17, 2017 |
| **Dean/Associate VP:** Lucy Lee | **Date approved:** | January 6, 2017 |
| **Undergraduate Education Committee (UEC) approval** | **Date of meeting:** | March 24, 2017 |

**Learning Outcomes**

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

1. State Mendel's two Laws and relate these to meiosis
2. Calculate map distances and generate restriction enzyme maps
3. Critically interpret data in order to deduce modes of inheritance and predict outcomes of crosses
4. Describe models for the regulation of gene function in cells
5. Explain the techniques and applications commonly used in a modern genetics laboratory
6. Describe how genes can be isolated from the genome of an organism

**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.

**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.** | Klug/Cummings | Concepts in Genetics | ☒ | Pearson | 2014 |
| **2.** | | | ☐ | | |
| **3.** | | | ☐ | | |

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

**Typical Evaluation Methods and Weighting**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Final exam: | 40% | Assignments: | % | Midterm exam: | 30% | Practicum: | % |
| Quizzes/tests: | 12% | Lab work: | 18% | Field experience: | % | Shop work: | % |
| Other: | % | Other: | % | Other: | % | Total: | 100% |

**Details (if necessary):**

**Typical Course Content and Topics**

The major topics included in this course:

1. Basic Mendalian Genetics
2. Mitosis and meiosis
3. Elementary probability
4. Mapping genes on eukaryotic, bacterial and viral chromosomes
5. Basic cytogenetics
6. DNA structure
7. Replication
8. Transcription and translation
9. Cloning and sequencing
10. Control of gene expression
11. Eukaryotic chromosomes

**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