

*This syllabus is a general representation of the course as previously offered and is subject to change.*

## **BIOL 463 – Gene Regulation in Development**

### General Course Syllabus (as of January 2020)

#### **About the Course:**

**Course Description:** In this course, the main goal is for students to develop the ability to think and ‘function’ like a successful and thoughtful scientist, while gaining a solid understanding of some of the main principles and concepts in gene regulation and general developmental biology. Course content includes an examination of multiple mechanisms that regulate gene expression in the context of animal development, examples of epigenetic determination, and some of the techniques commonly used to investigate them.

**Course Format:** Active lecture. All lessons include group discussions and other interactive elements, and the course heavily relies on various forms of group work.

**Credits:** 3

**Prerequisites:** BIOL 335 and one of BIOL 201, BIOC 202, BIOC 203. (BIOL 331 is recommended.)

#### **Course Learning Outcomes:**

The main goal of this course is for students to develop the ability to think and ‘function’ like a successful, thoughtful, and collegial scientist. The second goal of the course is for students to gain a solid understanding of some of the main principles and concepts in gene regulation and general developmental biology. After all, one needs to understand a topic well in order to ask interesting questions and to grasp the information provided in the literature.

By the end of this course, students should be able to:

- Develop attitudes and skills of a successful, thoughtful, and collegial scientist (in their approach to questions, concepts, facts, tasks, challenges, gaps in knowledge, working with others, and new evidence).
- Search, identify, manage and produce (scientific) information effectively.
- Develop questions, hypotheses and models, and make predictions.
- Design experiments to test a given hypothesis and analyze and interpret data.
- Demonstrate mastery of specific content elements covered in class.
- Be proactive and constructive when working with others.
- Change their opinions and values in response to new, solid evidence.

## **Textbooks and Additional Resources:**

There is no textbook for this course. Required and supplemental readings will be available from the course Canvas site; these may include review articles, notes, Internet material, primary publications, etc.

## **Evaluation:**

Evaluation is based on a series of quizzes, group projects, group assignments, and individual reflections. Specific assessment activities and their relative weight vary by year - please contact the instructor for more information.

## **Schedule of Topics:**

The course begins with an introduction to the major concepts and techniques in development, gene regulation, and epigenetics. For the remaining  $\frac{3}{4}$  of the term the course includes selected topics that vary depending on the year and on student interest. For more information about a specific year's topics and schedule, please contact the instructor.

Sample past topics include: cis-regulatory elements, long non-coding RNAs and complex gene loci, genomic imprinting and neurogenetic syndromes, inheritance of epigenetic marks, and phenotypic defects due to misregulation of genes.

A sample schedule of topics from 2019W1 is below:

<b>Week</b>	<b>Module</b>
1	Introduction to the Course;
2	Developmental processes; Epigenetics
3	Epigenetics continued; Case Study: analyzing and proposing a comprehensive model to explain a particular developmental difference
4	Case Study - analyzing and proposing a comprehensive model to explain a particular developmental difference
5	
6	
7	Hox genes regulation and developmental functions
8	
9	
10	
11	Special Topic: X-chromosome inactivation in mammals
12	
13	Flex Week

## ***University Policies:***

*UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.*

*UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.*

*UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.*

*UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.*

*Details of the policies and how to access support are available on [the UBC Senate website](#).*