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

BIOL 331 – Developmental Biology

General Course Syllabus (as of September 2019)

About the Course:

Course Description: A course on animal development and its underlying causal principles, as well as introductory embryology. This course will introduce students to the very broad field of developmental biology. It will emphasize the cell biology and signaling pathways (the mechanisms) that underlie animal development, and cover conserved principles of development that occur across evolution. Examples will draw from invertebrate and vertebrate model systems including Drosophila, C. elegans, sea urchins, chick, frog, zebrafish, mice and humans. The course is divided into specific modules where lectures are coordinated with the laboratory assignments.

Course Format: Lecture and Laboratory
Credits: 4
Pre-requisites: Either:
(a) BIOL 201 or
(b) all of BIOL 200, BIOL 260 and one of BIOL 233, BIOL 234.

Course Learning Objectives:

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

- Analyze and evaluate primary literature and examine how the scientific literature informs the understanding of scientific concepts.
- Participate actively in their own learning by integrating independent work with group discussion (or activities) during lecture and laboratory instruction.
- Appreciate and appraise the relationship between laboratory experiments and concepts covered in class.
- Describe and apply knowledge on the genetic, cellular and molecular mechanism that underlie animal development.
- Appreciate how developmental biology integrates, molecular, cellular, physiological and evolutionary biology.
- Predict and explain the implications to organism development following alterations in gene expression or environmental changes.

Textbooks and Additional Resources:

Textbook (optional): Developmental Biology 12th edition (Gilbert/Barresi)

- Available at the UBC bookstore or Amazon.ca.
- 11th or 10th editions are also acceptable.

Online access (recommended): Vade Mecum https://labs.devbio.com/

- This course will use the DevBio Laboratory: Vade Mecum 3 Website by Mary S. Tyler and Ronald N. Kozlowski with adaptations of the laboratories from this site.

- "*DevBio Laboratory: Vade Mecum3* is an interactive Web application that explores the many aspects of developmental biology and lets you see first-hand the fascinating and diverse nature of this field. Access to the site is included with all new copies of the textbook Developmental Biology, Tenth or Eleventh Edition, by Scott F. Gilbert." -Vade Mecum 3 Website

For the lectures: Register your iClickers on Canvas

For the labs (required):

- Lab coat
- Lined notebook
- Waterproof fine-tipped sharpie

Optional: Dissection kit

Piazza (recommended): the course may use Piazza for class discussion. The system is highly catered to getting students help fast and efficiently from classmates, the TA, and the instructor so students are encouraged to post questions on Piazza rather than emailing the instructor directly.

Evaluation:

Sample grade distribution from 2019W1 (subject to change):

Assessment	**Weight**
Lecture (50%)	
• Clicker questions and worksheets	5%
• Midterm	15%
• Final exam	30%
Lab (50%)	
• Prelab quizzes	3%
• Lab notebook and participation	3%
• Lab reports (3) (3rd lab includes CURE project proposal 5% + report 12%)	29%
• Lab exam	15%

DETAILS ON ASSESSMENTS:

Clicker questions and worksheets: Clicker questions during lectures will provide an opportunity to process the information and apply the concepts covered in lecture. Marks are provided for participating and for selecting the correct answer.

Worksheets completed as a part of the pre-lab activities are in place to help students prepare for the upcoming laboratory. Worksheets will be due either before the lecture or will be completed in class in small groups.

Prelab quizzes: The weekly prelab quiz will test concepts from the lectures/readings and the laboratories protocols and objectives.

Lab reports: The purpose of the lab report is to describe and analyze a laboratory experiment that explores a scientific concept so that other scientists might be able to replicate the experiment and investigate the principles of it. There will be three (3) lab reports in total, for each set of laboratory experiments (sea urchin experiments, drosophila experiments, chick embryo CURE experiments). The lab report must also be uploaded to Turnitin.com. There is a 10% per day penalty for late lab report submissions.

Schedule of Topics:

Below is a sample schedule from 2018W (subject to change):

Week	Lecture	Lab
1	Introduction to Embryology	*No Labs*
2	Fertilization	Lab 1: Introduction and Microscopy
3	Early Cleavage and Axis Formation	Lab 2: Fertilization and Early Cleavage
4	Gastrulation	Lab 3: Gastrulation and Polyspermy
5	Gastrulation	Lab 4: Environmental effects on development
6	Midterm Review Session **Midterm**	*No Labs*
7	Gastrulation, Axis induction	Lab 5: Body patterning
8	Axis Induction, Nervous system induction and patterning	Lab 6: Master control genes
9	Nervous system	Lab 7: Chick development – Nervous system
10	Neural crest, Mesoderm	Lab 8: Chick development – Mesoderm
11	Mesoderm	*No Labs*
12	Limb Development	Lab 9: Chick development – Limbs
13	Limb Development, Final Exam Review	**Lab Exam**

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 ae 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.