

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

BIOL 352 – Plant Physiology II: Plant Development

General Course Syllabus (as of August 2019)

About the Course:

Course Description: An introduction to the processes involved in growth and development: cell division, tissue culture, meristems, differentiation, and the action of major growth regulators, and photomorphogenesis. Emphasis is on experimental approaches.

Course Format: Lecture, Laboratory, and Tutorial. (2 hours lecture/week; 3 hours lab/week; optional 1-hour tutorial/week.)

Credits: 3

Prerequisites: Either:

- (a) BIOL 200 and one of BIOL 233, BIOL 234; or
- (b) FRST 302. (CHEM 233 is recommended.)

This course is restricted to students in year: ≥ 3 .

Course Learning Objectives:

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

- Obtain an understanding of concepts, processes, and experimental approaches related to the physiology of plant growth and development.
- Understand how the scientific process can be used to answer questions concerning the control of plant development. Students will be asked to:
 - use specific experimental approaches to answer questions and test hypotheses.
 - interpret new data in light of their understanding of concepts and processes.
- Understand how to use the various biological approaches (genetic, biochemical and physiological) to study the control of plant growth and development.
- Appreciate the practical importance of plant development.

Thus, in addition to learning **what** is known about plant development, students will be asked to learn **how** this is known and to use this information to solve problems.

Textbooks and Additional Resources:

Required Text:

Taiz, L., Zeiger, E., Moller, I.M., and Murphy, A. Plant Physiology and Development, sixth edition (2015).

Supplementary Reference Material:

Selected articles, book chapters, and other material will be given. Supplemental Videos can be found in the resources folder of the course website.

i-Clickers:

Clickers will be used in lectures and tutorials. Students must ensure they register their PRS number on Canvas so that it is synchronized with their student number.

Website:

<https://canvas.ubc.ca/>

(Students will need aCWL ID and password to access the course website)

Evaluation:

As a guideline (may change with year), the final mark for each student will be based upon the following components:

Assessment	Weight
Lab, based on: <ul style="list-style-type: none">written Journal-style lab reports,a research project proposal, andresearch presentations and attendance(evaluated by instructor and TAs).	35%
Clicker questions (participation mark)	5%
Homework (online)	5%
Midterm Exam	20%
Final exam (cumulative)	35%

Course Policies:

- In order to pass the course, students must pass both the lab and the lecture components separately.**
- An individual student's marks for each of the three components, lab grade, midterm exams and final exam will be counted (**No grades will be dropped**).
- Final exam will be **cumulative**: All lecture and tutorial material may be covered.
- Students will require a valid excuse (e.g. illness, verified by a medical practitioner's certificate) for missing a quiz or midterm exam.

Schedule of Topics:

Below is a sample schedule from 2018W2 (subject to change). The lecture and tutorial topics may change with year.

Tutorials will be focused on solving problems relevant to lecture materials. Attendance at tutorials is optional but recommended.

Unit	Lecture	Tutorial
1	Introduction to Plant Hormones and Signal Transduction (~3 lectures, 2 tutorials) <ul style="list-style-type: none"> • Introduction to Plant Hormones • Intracellular and Intercellular hormonal signaling • Regulatory levels in hormonal signaling 	<i>Tutorial 1: Molecular Biology Techniques refresher</i> <i>Tutorial 2: Problem Solving: Hormonal signaling and regulation</i>
2	Embryogenesis and Germination (~6 lectures, 3 tutorials) <ul style="list-style-type: none"> • Introduction to Plant Development • Tissue Specification • Radial Patterning • Cell fate determination • Germination – Hormonal Requirements • Germination – Regulation 	<i>Tutorial 3: Problem Solving: Embryogenesis and Tissue specification</i> <i>Tutorial 4: Problem solving: Cell Fate and Radial patterning</i> <i>Tutorial 5: Problem solving: Germination</i>
3	Seedling Growth (~4 lectures, 2 tutorials) <ul style="list-style-type: none"> • Auxin Biosynthesis and homeostasis • Auxin transport • Phototropic and Gravitropic responses • Auxin Signaling 	<i>Tutorial 6: Problem solving: Auxin biosynthesis and homeostasis</i> <i>Tutorial 7: Problem solving: Auxin Responses and Signaling</i>
	Midterm Exam: 50 minutes	
4	Making Flowers and Fruits (~5 lectures, 3 tutorials) <ul style="list-style-type: none"> • Meristem establishment, Identity and Maintenance • Floral Organ Specification • Floral Meristem Identity • Environmental regulation of flowering • Fruit development and ripening 	<i>Tutorial 8: Problem Solving: Auxin Signaling</i> <i>Tutorial 9: Problem Solving: Floral organ specification and identity</i> <i>Tutorial 10: Problem Solving: Regulation of flowering and ripening</i>
5	Senescence (~2 lectures, 1 tutorial) <ul style="list-style-type: none"> • Stages of plant senescence • Regulation of senescence 	<i>Tutorial 11: Problem Solving: Problem Solving Senescence</i>
6	Developmental and Environmental Integration (~3 Lectures, 1 Tutorial, 1 Exam Review Exercise)	<i>Tutorial 12: Problem Solving: Hormonal Signal Integration</i>

	<ul style="list-style-type: none">• Environmental Signal integration: Flowering / Stomatal Regulation• Developmental Signal integration: Cell Division / Cell Expansion• In class Learning Objectives review• In class Exam Exercises Practice	
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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](#).