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

BIOL 415 – Evolutionary Processes in Plants

General Course Syllabus (as of November 2019)

About the Course:

Course Description: A course on the experimental and comparative analysis of evolutionary processes, speciation, and phylogenetic patterns in plants. Emphasis will be on the evolution of land plants, of which approximately 300,000 species are extant today.

Course Format: Lecture
Credits: 3
Prerequisites: BIOL 336. BIOL 324 is recommended.

Course Learning Outcomes:

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

- Describe how plants evolve, including their origin and diversification.
- Summarize and critically evaluate information from scientific literature.

This course has two major goals. The first goal is for students to gain a better understanding of how plants evolve. Plants provide food, oxygen, shelter, clothes, and many of the drugs protecting against disease. Plants mitigate pollution, lessen climate change, contribute to healthy watersheds, control erosion, provide habitat for animals, and add beauty to the places we live. Thus, there is considerable incentive for understanding their origin and diversification.

The second goal is to help students transition from textbook learning to learning from the scientific literature. To ease the transition, the course will employ a lecture/discussion format and focus on high-profile case studies and/or reviews of important topics in plant evolution.

Textbooks and Additional Resources:

There will be no textbook for this class. All readings will be from refereed journal publications, provided on the course website on Canvas (canvas.ubc.ca).

Grading Scheme:

Assessment	Weight
Paper summaries (1% each)	25%
Quizzes	20%
Written research proposal (20% each)	40%
Presentation of research proposal	5%
Paper presentation/discussion	5%
Participation	5%

DETAILS ON ASSESSMENTS

This seminar course will be a series of short lectures and discussions. Grades will be based on preparedness as demonstrated by paper summaries/discussion points, on participation in class, and on the proposed experiments.

- **Preparation.** To encourage preparation of the participants and to allow time for integration and synthesis before class, each student should provide a one-paragraph summary of each paper as well as a list of three or four salient points/questions for discussion. Summaries will be graded on a scale of 0 to 6 points. Please avoid all types of plagiarism!
- **Discussion**. Each student will be asked to lead one weekly discussion, by preparing a 5-10 minute presentation on the papers to be discussed, and pose guiding questions to encourage discussion among their peers.
- **Experiments.** Students will propose two experiments that ought to be done to advance existing knowledge on evolution. For each experiment, students would prepare an approximately 5-page write up explaining (a) the question that motivates the proposed study; (b) why it is important; (c) the appropriate methodology; (d) predicted results; and (e) the potential significance of the findings. In addition, students will be asked to summarize one of these experiments for the class in the last few days of the semester.

There will also be short bi-weekly quizzes on lecture material to encourage students to review and synthesize important information and concepts. The questions will be mostly short answer or occasionally multiple choice.

There will be a 10% penalty for each day an assignment is late or awaiting revision.

Schedule of Topics:

A sample schedule from 2018W2 is below. Discussion sessions will be held weekly.

Theme	Week	Lecture Topics
Introduction	1	- Introduction
Evolution of Populations	2	- Genetic drift & population structure - Gene flow
	3	- Phylogeography - Local adaptation
	4	- Coevolution - Mating system evolution - **Introduce research proposal assignment**
	5	- Sexual system evolution
Plant Speciation	5	- The nature of plant species - **Group discussion of ideas for research proposal**
	6	- Reproductive isolation - Chromosomal speciation - **Bring/discuss proposal outlines**
	7	- Polyploid speciation - Hybrid speciation
	8	- Speciation and macroevolution - **First Research Proposal Due**
Plant Evolution and Us	8	- Plant conservation genetics
	9	- Climate change and plant evolution - Weed evolution
	10	- Plant domestication - Crop diversity
Plant Genome Evolution	11	- Population genomics of adaptation - Paleopolyploidy - **Bring/discuss proposal outlines**
	12	- Nuclear genome evolution - Organelle genome evolution
	13	- **Project presentations-I** - **Project presentations-II** - **Project presentations-III** - **Second Research Proposal Due**

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.