

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

BIOL 421 / APBI 426 – Plant-Microbe Interactions

General Course Syllabus (as of July 2019)

About the Course:

Course Description: The course covers the biochemistry, biology, genetics, and physiology of selected plant-microbe relationships, and the impacts of plant-microbe relationships on society (positive and negative). Students will be introduced to key concepts, tools and techniques for studying plant-microbe interactions, and specific beneficial and pathogenic interactions involving viruses, bacteria, fungi, oomycetes, and plant defense.

Course Format: Lecture and Tutorial

Credits: 3

Prerequisites: BIOL 200 and one of BIOC 202, BIOC 203, BIOL 233, BIOL 234, BIOL 260.

Course Learning Objectives:

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

- Distinguish between the different types of plant-microbe interactions.
- Explain the physiological and biochemical processes underlying the best characterized plant-microbe interactions.
- Recognize conserved processes among plant-microbe interactions.
- Objectively analyze the design and content of current research studies from the scientific literature.
- Draw connections between the biology of plant-microbe relationships and the impacts of these relationships on the ecosystem and human society.

Textbooks and Additional Resources:

No textbook, but course website on Canvas (canvas.ubc.ca)

Grading Scheme:

Assessment	Weight
Midterm examination	20%
Literature discussions	20%
Group presentation (case study)	20%
Final examination (in exam period)	40%
Total	100%

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Midterm and Final Examination Format: includes definitions of key terms, short essays, and long essays. Students will have options for which questions to answer, and will be examined on lecture, reading, and discussion material.

Literature Discussion: involves 6 sessions on research topics in Plant-Microbe Interactions. Current research papers and set of questions will be provided around one week in advance. Students will work in groups to discuss/present the answers during the assigned discussion periods and turn in their answer sheets. Evaluation is based on written answers and participation.

Group presentation format: Each team of ~3 students will develop a story around their assigned topic. They will give a 15 minute oral presentation with Powerpoint slides in the tutorial period at the end of the term. The presentation format used in the course lectures should be used as a guide. Evaluation will be based on quality and appropriateness of the (scientific) content, effectiveness of the organization of the presentation, clarity of oral communication, and participation and team-work.

Schedule of Topics:

Week	Topic
1	Course structure, overview of plant microbe interactions Introduction, motivation, key concepts, tools
2	Beneficial microbes, sign up for case study topics Rhizobium bacteria and nitrogen fixation (Guest expert, Dr. M. Kretschmer)
3	Rhizobium continued/Mycorrhizal fungi Mycorrhizal fungi Literature discussion #1
4	Mycorrhizal fungi Agrobacterium tumefaciens and crown gall disease
5	Literature discussion #2 Viruses
6	Review (Lecture period) & Midterm examination (Tutorial period) Overview of disease and plant immunity
7	Bacterial pathogens – mechanisms of plant disease Bacterial pathogens, continued
8	Literature discussion #3 Fungal pathogens – mechanisms of plant disease Fungal pathogens, continued
9	Fungal pathogens, continued Literature discussion #4

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10	Fungal pathogens, continued Case Study presentations (Tutorial period) Oomycete pathogens
11	Literature discussion #5 Case Study presentations (Tutorial period) Plant immunity
12	Plant immunity Case Study presentations (Tutorial period) Literature discussion #6
13	Plant immunity Case Study presentations (Lecture and Tutorial period) Course review
Date/time TBA	Final 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 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.](#)