# Course Outline Form: Fall 2016

## General Information

**Course Title:** PLANT MICROBIOLOGY

**Course Description:** In this course, the interaction between plants and microorganisms will be studied. Topics include molecular plant-microbe interactions, plant defenses, bacterial ice nucleation, interactions among plant microbes, root nodulation, mycorrhizae and decomposition of plant litter.

**Credit Weight: 0.50**

**Academic Department:** School of Environmental Sciences

**Campus:** Guelph

**Semester Offering:** Fall 2016

**Class Schedule and Location:** MWF 4:30PM-5:20PM, John T. Powell Building 212

## Instructor Information

Instructor Name: Paul Goodwin

Instructor Email: pgoodwin@uoguelph.ca

Office location and office hours: Room 3239, Bovey Building, MWF, 3:30-4:30

## GTA Information

GTA Name: NA

GTA Email: NA

GTA office location and office hours: NA

## Course Content

### Specific Learning Outcomes:

1. Memorize the ecological and evolutionary concepts underlying plant-microbe interactions.

2. Describe examples of interactions of microbes with different types of plant tissues.

3. Evaluate examples of plant-microbe interactions to recognize similarities and differences between the various types of interactions.

4. Evaluate examples of plant-microbe interactions to integrate the ecological, molecular, physiological and cellular aspects of plant-microbe interactions.

5. Recognize the historical impacts of plant-microbe interactions.

6. Apply the concepts and examples from the course to describe and evaluate a recent primary research article concerning an aspect of a plant-microbe interaction.

### Lecture Content:

Introduction

Types of microbes

Ecological and evolutionary concepts of plant microbiology

Phylloplane microbiology

Leaf and stem microbiology

Disease resistance

Root microbiology

Vascular tissue microbiology

Seed and fruit microbiology

Post-harvest microbiology

Conclusions

### Labs: NA

### Seminars: NA

### Course Assignments and Tests:

| **Assignment or Test** | **Due Date** | **Contribution to Final Mark (%)** | **Learning Outcomes Assessed** |
| --- | --- | --- | --- |
| 1st mid-term exam | Friday, Oct. 7 | 24 | 1, 2, 3, 4, 5 |
| Approval of review essay topic | Friday, Oct. 14 | 2 | 6 |
| 2nd mid-term exam | Friday, Nov. 4 | 24 | 1, 2, 3, 4, 5 |
| Review essay | Friday, Nov. 18 | 20 | 6 |

Additional Notes:

- Hard copy only to be submitted forApproval of review essay topic and Review essay.

- Mid-term exams are taken in class periods.

- Exams are to be completed in pen only. Essay questions are to be completed using full sentences and paragraphs.

- Exams will be returned for review in class and then collected following its discussion. Please doNOT make notes directly on the graded exam. Notes can be made on a separate paper in pencil.

-Students can arrange with the instructor to review the correct exam answers from the grading key without potential re-grading of their exam. However, a request for a review of a student’s own exam can result in an increase or decrease in the exam grade.

### Final examination date and time: Monday, Dec. 12, 11:30-13:30

### Final exam weighting: 30%

## Course Resources

### Required Texts: NA

### Recommended Texts (on reserve in library):

1. Plant Microbiology, by R. Campbell (phylloplane, parasites, rhizosphere).
2. Fungal Biology, by J. Deacon (pathogenicity, mutualism, biological control).
3. Plant Pathology, by G.N. Agrios (pathogens, host resistance, pathogen taxonomy).
4. Plant defense: warding off attack by pathogens, herbivores and parasitic plants, by D. Walters [electronic resource] (virology, agrobacterium, disease resistance).
5. Plant surface microbiology, by A. Varma [electronic resource] (phylloplane adaptations, ice nucleation, grass endophytes)
6. Example paper for the review essay: Quorum sensing by *Pseudomonas syringae* pv. *syringae* and its potential inhibition by bacterial epiphytes.

### Lab Manual: NA

### Other Resources:

Lecture notes, illustrations and hand-outs for the course are not available on the web.

### Field Trips:

Walking tour of plant diseases at the University of Guelph Arboretum. (During one lecture period in the second or third week of the course.)

### Additional Costs: NA

## Course Policies

### Grading Policies:

- Exams are graded for knowledge of specific lecture material.

- Questions on the 2nd mid-term exam primarily, but not entirely, covers lecture material following the 1st mid-term exam.

- Points will be subtracted from exams for any incorrect statements in an answer, but the grade cannot go below zero for an individual question.

- Approval of Review essay topic and Review essays will be penalized by 10% for each working day late (5:00 PM deadline) and can become a negative mark.

### Course Policy on Group Work:

Group work is not allowed.

### Course Policy regarding use of electronic devices and recording of lectures:

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

## University Policies

### Academic Consideration:

The University of Guelph is committed to supporting students in their learning experiences and responding to their individual needs and is aware that a variety of situations or events beyond the student's control may affect academic performance. Support is provided to accommodate academic needs in the face of personal difficulties or unforeseen events in the form of Academic Consideration.

Information on regulations and procedures for Academic Consideration, Appeals and Petitions, including categories, grounds, timelines and appeals can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml).

### Academic Misconduct:

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Detailed information regarding the Academic Misconduct policy is available in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml).

### Accessibility:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS), formerly Centre for Students with Disabilities (CSD), as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca or visit the [Student Accessibility Services website (http://www.uoguelph.ca/csd/)](http://www.uoguelph.ca/csd/).

### Course Evaluation Information:

End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions used as an important component in the Faculty Tenure and Promotion process, and as valuable feedback to help instructors enhance the quality of their teaching effectiveness and course delivery.

While many course evaluations are conducted in class others are now conducted online. Please refer to the [Course and Instructor Evaluation Website](https://courseeval.uoguelph.ca/) **for more information.**

### Drop period:

The drop period for single semester courses starts at the beginning of the add period and extends to the Fortieth (40th) class day of the current semester (the last date to drop a single semester courses without academic penalty) which is listed in [Section III (Schedule of Dates) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/).

The drop period for two semester courses starts at the beginning of the add period in the first semester and extends to the last day of the add period in the second semester.

Information about Dropping Courses can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/).

## Additional Course Information

**Approximate Schedule:**

Date Activity

Friday, Sept. 9 First Class

Monday, Oct. 10 Thanksgiving (no class)

Wednesday, Nov. 30 Last Regularly Scheduled Class

Friday, Dec. 2 Reschedule of Thanksgiving (Monday schedule)

**Approval of Review Essay Topic:**

A hard-copy of your review essay title and selected references is required to approve your choice of topic and primary research article. The review essay topic approval included the title of the review essay which should be specific and directly related to the primary research article that is the focus of the review essay. Below the title on the same page, include the bibliographic information (authors, year, title, journal, volume, pages) of 5 selected pertinent references (but no more than 5) obtained from a computer search using AGRICOLA, CAB Abstracts, Life Sciences Database, and/or other databases in the library. One of these 5 must be your primary research article that was published in the last 4 years, which should be marked “PRIMARY RESEARCH ARTICLE” and MUST include the abstract from that article. All references must be available in the University of Guelph Library. A “resubmit” mark indicates that changes are required for the topic to be approved, and a revised version must be submitted to the instructor within the following 7 days from when it is returned. All review essays must have an approved review essay topic.

**Review Essay:**

Students are required to submit a 6-8 page hard copy of double-spaced text (6-8 pages excludes the cover page, references, appendix with tables or figures), which reviews a topic related to the mechanisms of how plants and microorganisms interact (not disease management, infection cycles, nor pathogen detection). The focus is a primary research article that was published in the last 4 years. A primary research article contains results/data. Primary research articles are the basis of all scientific knowledge in modern times, and the ability to read, analyze and place primary research articles in context is an important scientific skill. The review essay begins with an introduction of the specific topic followed by the relevant background needed to understand the results of the primary research article. That is followed by at least one full page of a general description of the results/data in the primary research article along with the conclusions of the primary research article. Do not include details about methods. Provide only enough of a general description of methods so that the results are understandable. The last part of the review essay is a description as to how the primary research article advances our understanding. Do not use any lecture notes or websites (other than e-journals) as reference material, and only minimal use (1-2 references at most) of textbooks. I would expect 12-24 references with the “PRIMARY RESEARCH ARTICLE” marked in the reference list as per the example essay paper on reserve in the library. Cover page, margins, type size and spacing must follow the example essay paper on reserve. No sub-headings or quotations allowed. No figures or tables are allowed. Because there is a close link between thought and expression, the review essay will be graded for the quality of written expression as well as for content.