

BIOL 402

Experiments in Plant Physiology

Winter Term 2020

CALENDAR DESCRIPTION

Laboratory-based course emphasizing experimental approaches to understanding the principles of plant physiology covered in BIOL 341/3.0.

LEARNING HOURS 114 (36Lb;24T;6O;48P)

PREREQUISITE A minimum GPA of 2.0 in the Biological Foundations List.

COREQUISITE BIOL 341/3.0.

GENERAL SCHEDULE: On a weekly basis, this course uses a two hour preparatory tutorial followed by a three hour lab for conducting the experiments on another day later in the week. All preparatory tutorials and labs are held in BIOSC 3306.

| | |
|---|---|
| Course Instructor & Lab Instructor | K. Ko B. Vanderbeld |
| Contact Information for Instructors | kok@queensu.ca , Phone: 613-533-6155 vanderb@queensu.ca , Phone: 613-533-6000 x77438 |
| Office Hours | Please schedule by email or through other means |
| TA: | TBD |
| TA Contact Information | TBD |
| TA Office Hours | Please schedule by email or through other means |

Learning Objectives

The main goal of Biol 402 is to help students acquire a comprehension of experimental plant biology. The course explores various lab exercises in plant cell biology, physiology, anatomy, bioinformatics, and biochemistry.

The course objectives, broadly speaking, are to help students to:

- (i) understand plant biology through experimental methods
- (ii) understand the scientific method of hypothesis development and testing
- (iii) learn a number of new technical skills applicable to a broad range of scientific endeavours

Learning Hours:

The table below provides an **estimate** of hours of study for Biol402. This is for general reference purposes only and is not intended to describe the precise duration of time the course will require. The nature of assignments will vary year to year and thus the allocation of time to various activities will vary accordingly. A 3.0-unit course would normally require a total of 110 to 130 total learning hours (or hours on task) and Biol402 will fall within that window on any given calendar year. It is prudent to keep in mind however that time commitment to some tasks will vary widely among students depending upon individual aptitude, level of background, etc.

| <i>Teaching method</i> | | <i>Average hours per week</i> | <i>Number of weeks</i> | <i>Total hours</i> |
|------------------------|------------------------|-------------------------------|------------------------|--------------------|
| In-class hours | Lectures | | | |
| | Seminars | | | |
| | Laboratories | 3 | 12 | 36 |
| | Tutorials | 2 | 12 | 24 |
| | Group learning | | | |
| | Individual instruction | | | |
| Other | Online activities | 1 | 6 | ~6 |
| | Private study | 4 | 12 | ~48 |
| Total learning hours | | | | ~114 |

Course Outline

The course explores a broad range of concepts in experimental plant physiology. Topics covered may vary somewhat year-to-year, and are subject to change, but generally include lab exercises on photosynthesis/respiration, plant enzyme analysis, growth and development, phytohormones, genomics/bioinformatics, protein electrophoresis/western blotting, and gene expression. In addition, a major independent project is carried out (in pairs) during the final weeks of the course and allows students to participate in discovery-based research where they conduct experiments of their own design. Students present their project to the class in the final lab slot (and the tutorial slot if necessary). Regular pre-lab quizzes and proposed work-plans are used throughout the course to help students come prepared for the labs and to gauge their understanding of course material. The lab test conducted near the end of the course covers all material from the course prior to the independent projects. The nature of graded assignments will vary year-to-year but could include one or more of the following: in-class quizzes, online quizzes/assignments, major independent lab project (in pairs), lab write-ups, participation in discussions in class, class presentation (on your project topic).

Textbooks/Readings

There is no assigned text for this course. Lab documents will be posted on the course's onQ website.

Tentative Grading Scheme

| Component | Weight (%) | Date |
|--|--|----------------------------------|
| Lab write-ups (6 labs, grading weight varies) | 35% Total: Lab 1 5% Lab 2 5% Lab 3 5% Lab 4 10% Lab 5 5% Lab 6 5% | As scheduled throughout the term |
| Independent Project | 42% Total: proposal 7% peer assessment 5% research report 20% presentation 10% | Late in the term |

| | | |
|-----------------------------|-------------|--|
| Prep Quizzes and Work-plans | 8% (4 X 2%) | As scheduled throughout the term (for 4 of the 5 Labs) |
| Lab test | 15% | Late in the term |

Grading Method

In this course, some components may be graded using numerical percentage marks. Other components may receive letter grades, which for purposes of calculating your course average will be translated into numerical equivalents using the Faculty of Arts and Science Letter Grade Input Scheme.

When letter grades are employed, the following scale will be employed for purposes of calculating your course average:

Arts & Science Letter Grade Input Scheme

| Assignment mark | Numerical value for calculation of final mark |
|------------------------|--|
| A+ | 93 |
| A | 87 |
| A- | 82 |
| B+ | 78 |
| B | 75 |
| B- | 72 |
| C+ | 68 |
| C | 65 |
| C- | 62 |
| D+ | 58 |
| D | 55 |
| D- | 52 |
| F48 (F+) | 48 |
| F24 (F) | 24 |
| F0 (0) | 0 |

Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

| Grade | Numerical Course Average (Range) |
|--------------|---|
| A+ | 90-100 |
| A | 85-89 |
| A- | 80-84 |
| B+ | 77-79 |
| B | 73-76 |
| B- | 70-72 |
| C+ | 67-69 |
| C | 63-66 |
| C- | 60-62 |

| | |
|----|--------------|
| D+ | 57-59 |
| D | 53-56 |
| D- | 50-52 |
| F | 49 and below |

Academic Integrity and Queen's Code of Conduct

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and conduct conform to the principles of academic integrity. Information is available from the instructor of this course and on the Biology Department's website:

(<http://biology.queensu.ca/academics/undergraduate/prepare-yourself/>). Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulations on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Accommodation Policy, Exam Conflicts, and Other Conflicts

Students who feel they need accommodations for disabilities or extenuating circumstances, or have a conflict between exams or other commitments should consult the Biology Department's website for details about how to proceed (<http://biology.queensu.ca/academics/undergraduate/prepare-yourself/>). In general, the earlier your instructor is apprised of an extenuating circumstance, the more likely an accommodation can be made. Students are encouraged to be proactive in anticipating difficulties, when it is possible to do so.

Late Policy

Late assignments will be penalized at 5% per day.

Copyright

Course material for Biol402 is copyrighted and is for the sole use of students registered in Biol402.

The material used in this course arises from two main sources, the course instructor and the registered students in the course. This material is thus designed for use as part of Biol402 at Queen's University and is the property of the instructor and students unless otherwise stated. Third party copyrighted materials (such as book chapters and articles) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law.

Copying this material for distribution (e.g. uploading material to a commercial third-party website) can lead to a violation of Copyright law. Find out more about copyright here:

<http://library.queensu.ca/copyright>

Disability Accommodations Statement Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Wellness Services (SWS) and register as early as possible. For more information, including important deadlines, please visit the SWS website at:

<http://www.queensu.ca/studentwellness/>