

BIOL 402

Experiments in Plant Physiology

Winter Term 2022

CALENDAR DESCRIPTION

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

COREQUISITE BIOL 341/3.0. EXCLUSION *BIOL 301/3.0*. EQUIVALENCY *BIOL 342/3.0*.

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	K. Ko
Contact Information for Instructor	kok@queensu.ca , Phone: 613-533-6155
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 Wet 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.

The following statement on academic integrity builds on a definition approved by Senate and is designed to inform students about the importance of the concept and the potential consequences of departing from the core values of academic integrity. It is highly recommended that this statement be considered.

Queen's students, faculty, administrators and staff all have responsibilities for supporting and upholding the fundamental values of academic integrity. Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility (see www.academicintegrity.org) and by the quality of courage. These values and qualities are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University.

Students are responsible for familiarizing themselves with and adhering to the regulations concerning academic integrity. General information on academic integrity is available at Integrity@Queen's University, along with Faculty or School specific information. Departures from academic integrity include, but are not limited to, plagiarism, use of unauthorized materials, facilitation, forgery and falsification. Actions which contravene the regulation on academic integrity carry sanctions that can range from a warning, to loss of grades on an assignment, to failure of a course, to 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.

The Queen's University Equity Office has the following statement on their webpage for your consideration
<http://www.queensu.ca/equity/accessibility/policystatements/accommodation-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 Student Wellness website at:
<http://www.queensu.ca/studentwellness/accessibility-services/>

Late Policy

Late assignments will be penalized at 5% per day.

Copyright

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