



BOT*2100 Life Strategies of Plants

Fall 2017

Sections(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - September 06, 2017

1 Course Details

1.1 Calendar Description

This course introduces the structures and processes used by plants in the greening of our planet, and how and why plants are basic to the functioning of the biosphere. This course includes hands-on experience in examining the cells, tissues and architectures of plants as well as selected processes of plant function.

Pre-Requisite(s): 2 of BIOL*1050, BIOL*1070, BIOL*1080, BIOL*1090

1.2 Course Description

This course introduces the structures and processes used by plants in the greening of our planet, and how and why plants are basic to the functioning of the biosphere. This course includes hands-on experience in examining the cells, tissues and architectures of plants as well as selected processes of plant function.

1.3 Timetable

Lectures: 10:00-11:20 Tuesday & Thursday, **RICH 2529 (Richards Building)**

Look through the readings listed in the lecture schedule (to follow below) **ahead** of time to get the most out of this course. You can print out the notes on Courselink but these are NOT complete so you are expected to **take notes during lecture**.

Labs: 2:30-5:20 Wednesday (section 1) OR Thursday (section 2), **SCIE3304**

Make sure that you read the pertinent lab exercises **ahead** of time. Consider any questions posed in each exercise; they can help you in completing the LAB REPORTS.

You are welcome to ask any questions during lectures, the laboratories or at any other times. I welcome contact via email and am happy to set up office meetings.

1.4 Final Exam

Mid-Term Exam: Tuesday October 24th

Final Exam: Friday December 8th

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructor(s)

Ian Tetlow

Email: itetlow@uoguelph.ca

Telephone: +1-519-824-4120 x52735

Office: SC1 4471 (laboratory 4409)

2.2 Instructional Support Team

Lab Co-ordinator: Chris Meyer

Email: cmeyer02@uoguelph.ca

Telephone: +1-519-824-4120 x53955

Office: SC1 3507

2.3 Teaching Assistant(s)

Name	Details
Cole Anderson	cander07@uoguelph.ca
Cecily Costain	ccostain@uoguelph.ca
Gregory MacNeill	gmacne01@uoguelph.ca
Matthew Carswell	mcarswel@uoguelph.ca

2.4 Teaching Assistants

The TAs are responsible for dealing with your questions and making sure that you understand the procedures. In addition, they will be able to give you help in getting all the exercises to work.

They will grade the LAB REPORTS that are handed in at the end of laboratories (see Grades).

3 Learning Resources

3.1 Required Resources(s)

Raven Biology of Plants (Textbook)

Raven Biology of Plants, 8th Edition, 2013 by R.F. Evert and S.E. Eichhorn

Available from the bookstore and on 2-hour reserve in the Library.

Lab Manual (Lab Manual)

BOT*2100 Life Strategies of Plants, C.J. Meyer, Department of Molecular and Cellular Biology, College of Biological Science, University of Guelph, © Fall 2017.

You are responsible for bringing this manual to every laboratory. The charge also covers the cost of your project handout and other additional handouts that you will receive later in the semester.

Courselink (Website)

<https://courselink.uoguelph.ca>

This course will make use of the University of Guelph's course website (*via* Courselink). Consequently, you are responsible for all information posted on the Courselink page for BOT*2100. Please check it regularly.

3.2 Recommended Resources(s)

Undergraduate Calendar (Website)

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/>

The source of information about the University of Guelph's procedures, policies and regulations, which apply to undergraduate programs.

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Critically evaluate ideas and arguments by gathering and integrating relevant qualitative and quantitative information, assessing its credibility, and synthesizing evidence to formulate a position.
2. Accurately and effectively communicate ideas, arguments and analyses in graphic, oral and written form.
3. Collaborate effectively as part of a team by demonstrating mutual respect, and an ability to set goals and manage tasks and time lines.
4. Apply scientific methods and processes to generate and interpret scientific data using

quantitative, qualitative and analytical methodologies and techniques.

5. Demonstrate knowledge in the molecular and chemical composition of plants and their relationships to structure and function.
 6. Demonstrate knowledge in the fundamental vegetative and reproductive attributes of plants.
 7. Demonstrate knowledge in the interaction of plants with biotic and abiotic factors.
 8. Demonstrate knowledge in plant diversity and genetic variability and their relationship to evolution, speciation and adaptation.
 9. Demonstrate the use of modern techniques in plant research.
 10. Demonstrate skills to study plants in field or laboratory settings.
 11. Interpret the evolutionary history of plants through an examination of phylogenetic trees.
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5 Teaching and Learning Activities

5.1 Important Dates

September 7th: first lecture

September 20th and September 21st: first lab for section 1 and section 2 students respectively

October 24th: midterm examination

December 8th: final examination

5.2 Course Content

Lectures

Lectures will be in **RICH (Richards Building) Room 2529**

Lectures are on:

Tuesdays at 10:00 - 11:20 AM

Thursdays at 10:00 - 11:20 AM

The first lecture is on **Thursday September 7th**. You are most welcome to ask any questions during lectures, the laboratories, or at any other times.

Laboratories

Laboratories will take place in Room 3304 in the Science Complex.

Laboratories are on:

Wednesdays at 2:30 – 5:20 PM

Thursdays at 2:30 – 5:20 PM

Laboratories start on **Wednesday September 20th** and **Thursday September 21st**.

Make sure that you read the pertinent lab exercises **ahead** of time. Consider any questions posed in each exercise; they can help you in completing the LAB REPORTS. **Remember that you will be examined on laboratory-based material in the mid-term and final examinations.**

5.3 Note

You will require a minimum of 6 hours of **independent study** per week (reading, checking your notes, preparing for the lab) to really get the most out of this course. You will be asked to complete a **Course/Instruction and Teaching Assistant Evaluations** using **Courselink**. The evaluation surveys and comments will be given to the instructors after final grades have been submitted.

5.4 Lectures

Dr. T. Akhtar (lectures 1-11 and mid-term)

Dr. I. Tetlow (lectures 12-22 and final exam)

Week	Date	Topic	Readings (Evert & Eichhorn, 8 th edition)
1	Sept 7 th	Introduction to the course; Evolution of Plants	3-10, 246-248, 253-254, 348-358, 366-390

2	Sept 12 th	Evolution of Plants continued; Life Cycles (seedless plants)	391-456 but focus on 406-407, 410-411, 422-423, 442-443
3	Sept 14 th	Classification, Reproductive strategies	234-243, 457-465, 155-162, 169-171
4	Sept 19 th	Angiosperm flowers, Flowering genes	465-476, 477-492, 604-609, 668-670
5	Sept 21 st	Pollination, Embryogenesis - fruits	465-476, 526-532, 492-496
6	Sept 26 th	Seeds - Germination & early growth	472-473, 532-537, 675-676
7	Sept 28 th	Meristems, cells differentiating into tissues	42-62, 63-71, 538-541, 560-564, 579-583
8	Oct 3 rd	Cell types and tissues	541-555
9	Oct 5 th	Organ types - roots and shoots	558-569, 571-577, 579-588, 607-613
	Oct 10 th	FALL STUDY BREAK NO CLASSES	
10	Oct 17 th	Secondary growth - how plants get bigger	614-635, 569-571
11	Oct 19 th	Leaves - structure and function	588-602, 607-613

Oct 24th Mid-term Examination in class

12	Oct 26 th	Photosynthesis - evolution	94-106, 122-124
13	Oct 31 st	Photosynthesis - mechanism	125-135
14	Nov 2 nd	Photosynthesis - Carbon acquisition, C3, C4, CAM metabolism	135-148
15	Nov 7 th	Respiration	94-95, 107-121
16	Nov 9 th	Inorganic nutrients in soils - N symbiosis	683-700, 718
17	Nov 14 th	The Fungi (including mycorrhizae)	Chapter 14, and 700-701, 280-281, 312-315
18	Nov 16 th	Water - potential and uptake	78-85, 657-658
19	Nov 21 st	Water loss	519-520, 703, 711- 712, 720
20	Nov 23 rd	Moving water and sugars around the plant	708-727
21	Nov 28 th	Moving water and sugars around the plant	708-727
22	NOV 30 th	Review	

Final examination Friday December 8th (location TBA)

Note: Reduced versions of the lecture slides will be available on Courselink – it is suggested that you print them out and bring them with you to the lecture so you can take additional notes.

5.5 Laboratories

Week	Date	Lab #	Lab Title
1	Sept 20-21	1	Evolution of plants, life cycles & flower morphology
2	Sept 27-28	2	Seeds structure & germination Seedling growth and morphology
3	Oct 4-5	3	Seedling growth & morphology (continued) Meristems Identifying different cell types
4	Oct 11-12	4	Photomorphogenesis Root and stem anatomy
5	Oct 18-19	5	Leaf anatomy Epidermis and stomatal complexes

6	Oct 25-26	6	Photosynthesis in C3 and C4 plants Hill reaction Starch detection in leaves
7	Nov 1-2	7	Visualizing water transport Measuring osmosis Observing cell turgor and plasmolysis
8	Nov 8-9	8	Symbiotic plant-microbe interactions Introduction to the group projects
9	Nov 15-16		Group project work
10	Nov 22-23		Group project work
11	Nov 29		No lab scheduled – due date for group project reports

6 Assessments

Your grade for the course will be determined from the total results of one midterm examination, laboratory work including an independent project and a final examination.

6.1 Midterm Examination

The **MIDTERM EXAMINATION** will be held in class at **10:00 – 11:20 a.m. on Thursday February 16th**. It will contribute **30%** towards your final grade. Since the midterm examination occurs during a lecture period no alternative time will be scheduled. If you miss the midterm examination due to illness please notify us immediately or bring documentation as soon as possible.

6.2 Final Examination

The **FINAL EXAMINATION** will be on **Friday December 8th** (2:30-4:30 p.m., room to be announced). This examination will contribute **35%** towards your final grade. The final examination will cover primarily materials not covered in the midterm examination but will include related topics dealt with in the labs.

6.3 The Examinations

The examinations will cover the lecture AND laboratory materials. The examinations will consist of an array of multiple choice questions, some questions that require concise written answers, and analysis of visual materials. The answers to the midterm examination will be posted in the laboratory. The midterm examination will be returned to you. Any problems with examinations or questions arising from them must be resolved immediately.

6.4 Labs

LABORATORY WORK contributes **35%** towards your final grade. The grades come from:

10 scheduled laboratories that each require a lab report to be handed in either before you leave the lab, or the following week. Lab #1 is worth 2%, Labs #2-5 are worth 3%, Labs#6-7 are worth 4%, Lab #8 is worth 3%, and the group project report is worth 10%, for a **total of 35%** of your final grade.

7 Course Statements

7.1 Illness & other authorized absences

If you are absent during laboratory periods, the midterm or final examination, for legitimate medical or other authorized reasons, please make sure you contact us. Provide supporting documentation as soon as you are able.

8 Department of Molecular and Cellular Biology

Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.
<http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be

found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.uoguelph.ca/~ksomers/>

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The regulations and procedures for [Academic Consideration](#) are detailed in the Undergraduate Calendar.

9.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for [Dropping Courses](#) are available in the Undergraduate Calendar.

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas

9.6 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.

The [Academic Misconduct Policy](#) is detailed in the Undergraduate Calendar.

9.7 Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The [Academic Calendars](#) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.
