



# **BOT\*2100 Life Strategies of Plants**

Winter 2018

Sections(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - January 02, 2018

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## **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 Timetable**

- Lectures: 10:00-11:20 AM Tuesdays & Thursdays, THRN 1307 (Thornborough Building)
  - The first lecture is on Tuesday January 9. You are most welcome to ask any questions during lectures, the laboratories, or at any other times.
  - Look through the readings listed in the lecture schedule 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
  - Laboratories start on Wednesday January 17 and Thursday January 18.
  - 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.
  - 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.

### **1.3 Final Exam**

Final examination Saturday April 14, 2:30 - 4:30 PM

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## **2 Instructional Support**

## 2.1 Instructor(s)

**Dr. Ian Tetlow**

**Email:** itetlow@uoguelph.ca  
**Telephone:** +1-519-824-4120 x52735  
**Office:** SC1 4471

Dr. Ian Tetlow was awarded a B.Sc. (Hons) in Plant Science from the Faculty of Agriculture at the University of Newcastle-upon-Tyne, U.K. in 1986. His Ph.D. project, undertaken at University College of North Wales (Bangor), U.K., focused on the physiological responses of plants to attack by biotrophic fungi with an emphasis on the effects of plant pathogens on plant carbon metabolism. Following his Ph.D. Dr. Tetlow began post-doctoral work at the University of Manchester, U.K. studying the regulation of carbon metabolism in non-photosynthetic plastids. Following post-doctoral studies Dr. Tetlow continued to work in the area of non-photosynthetic carbon metabolism and was awarded a Leverhulme Special Research Fellowship, followed by an Industrial Fellowship, both of which were held at the University of Manchester. In 2002 Dr. Tetlow moved to the University of Guelph and is currently an Associate Professor in MCB. Current research interests involve understanding the role of protein-protein interactions and protein phosphorylation in regulating starch metabolism in crop plants and carbon partitioning in oilseed crops. Dr. Tetlow also teaches Metabolism in the Whole Life of Plants (BOT\*4380).

## 2.2 Instructional Support Team

**Lab Co-ordinator:** Dr. Chris Meyer  
**Email:** cmeyer02@uoguelph.ca  
**Telephone:** +1-519-824-4120 x53955  
**Office:** SC1 3507

Dr. Chris Meyer obtained B.Sc. and Ph.D. degrees in Plant Biology from the University of Waterloo. He has contributed to research and teaching in the plant sciences at the Universities of Waterloo, Wilfrid Laurier and Brock. Dr. Meyer continues to explore new approaches in plant science education at Guelph. As the BOT\*2100 Lab Coordinator, he manages all aspects of the teaching laboratory. See the Lab Manual for further details.

## 2.3 Teaching Assistant(s)

**Teaching Assistant:** Cecily Costain  
**Email:** ccostain@uoguelph.ca

- 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).

**Teaching Assistant:** Matthew Carswell  
**Email:** mcarswel@uoguelph.ca

- 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).

**Teaching Assistant:** Gregory MacNeill  
**Email:** macneilg@uoguelph.ca

- 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).

**Teaching Assistant:** Kristen Van Gelder  
**Email:** kvangeld@uoguelph.ca

- 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).

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## 3 Learning Resources

### 3.1 Required Resources(s)

#### Botany (Textbook)

- Botany (6<sup>th</sup> edition) by James D. Mauseth (Jones and Bartlett Learning)
- Available from the bookstore and on 2-hour reserve in the Library

#### Lab Manual (Lab Manual)

The required laboratory manual is: BOT\*2100 Life Strategies of Plants, C.J. Meyer, Department of Molecular and Cellular Biology, College of Biological Science, University of Guelph, © Winter 2018. 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.

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## 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

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.

### 5.1 Lecture

**Tue, Jan 9**

**Topic(s):** Introduction to the course; Evolution of Plants  
**Reference(s):** Readings: Chapters 17 (page 463+) and Chapter 19 (page 511+)

**Thu, Jan 11**

**Topic(s):** Evolution of Plants continued; Life Cycles (seedless plants)  
**Reference(s):** Readings: Chapter 20 (page 539+)

**Tue, Jan 16**

**Topic(s):** Classification, Reproductive strategies  
**Reference(s):** Readings: Chapters 20, 21 and 22 (page 539-587)

**Thu, Jan 18**

**Topic(s):** Angiosperm flowers, Flowering genes  
**Reference(s):** Readings: Chapters 9 (page 221+) and 23 (page 609+) Chapter 14 (page 387)

**Tue, Jan 23**

**Topic(s):** Pollination, Embryogenesis - fruits  
**Reference(s):** Readings: Chapter 23 (page 609+)

**Thu, Jan 25**

**Topic(s):** Seeds - Germination & early growth  
**Reference(s):** Readings: Chapter 9

<b>Tue, Jan 30</b>	
<b>Topic(s):</b>	Meristems, cells differentiating into tissues
<b>Reference(s):</b>	Readings: Chapters 4 & 5
<b>Thu, Feb 1</b>	
<b>Topic(s):</b>	Cell types and tissues
<b>Reference(s):</b>	Readings: Chapter 4 & 5
<b>Tue, Feb 6</b>	
<b>Topic(s):</b>	Organ types - roots and shoots
<b>Reference(s):</b>	Readings: Chapters 5 & 7
<b>Thu, Feb 8</b>	
<b>Topic(s):</b>	Organ types - roots and shoots
<b>Reference(s):</b>	Readings: Chapters 5 & 7
<b>Tue, Feb 13</b>	
<b>Topic(s):</b>	Secondary growth - how plants get bigger
<b>Reference(s):</b>	Readings: Chapter 7
<b>Thu, Feb 15</b>	
<b>Topic(s):</b>	Midterm Examination in class
<b>Mon, Feb 19 - Fri, Feb 23</b>	
<b>Topic(s):</b>	WINTER BREAK
<b>Tue, Feb 27</b>	
<b>Topic(s):</b>	Leaves - structure and function
<b>Reference(s):</b>	Readings: Chapter 6
<b>Thu, Mar 1</b>	
<b>Topic(s):</b>	Photosynthesis - evolution
<b>Reference(s):</b>	Readings: Chapter 10
<b>Tue, Mar 6</b>	
<b>Topic(s):</b>	Photosynthesis - mechanism
<b>Reference(s):</b>	Readings: Chapter 10
<b>Thu, Mar 8</b>	
<b>Topic(s):</b>	Photosynthesis - C acquisition, C3, C4, CAM
<b>Reference(s):</b>	Readings: Chapter 10
<b>Tue, Mar 13</b>	
<b>Topic(s):</b>	Respiration
<b>Reference(s):</b>	Readings: Chapter 11
<b>Thu, Mar 15</b>	
<b>Topic(s):</b>	Inorganic nutrients in soils - N symbiosis
<b>Reference(s):</b>	Readings: Chapter 13
<b>Tue, Mar 20</b>	
<b>Topic(s):</b>	The Fungi (including mycorrhizae)
<b>Thu, Mar 22</b>	
<b>Topic(s):</b>	Water - potential and uptake
<b>Reference(s):</b>	Readings: Chapter 12
<b>Tue, Mar 27</b>	
<b>Topic(s):</b>	Water loss
<b>Reference(s):</b>	Readings: Chapter 12

**Thu, Mar 29**

**Topic(s):** Moving water and sugars around the plant  
**Reference(s):** Readings: Chapter 12

**Tue, Apr 3**

**Topic(s):** Moving water and sugars around the plant  
**Reference(s):** Readings: Chapter 12

**Thu, Apr 5**

**Topic(s):** Review

## 5.2 Important Dates

- January 9: first lecture
- January 17 & 18: first lab for section 1 and section 2 students respectively
- February 15: midterm examination
- April 14: final examination

## 5.3 Independent Study

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.

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## 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 Marking Schemes & Distributions

Name	Scheme A (%)
Midterm	30.00
Laboratory Work	35.00
Final Examination	35.00
Total	100.00

### 6.2 Assessment Details

#### Midterm (30.00%)

**Date:** Thu, Feb 15, 10:00 AM - , 11:20 AM, In class

- 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.
- 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.

### **Laboratory Work (35.00%)**

**Date:** 10 Scheduled Laboratories

- Each lab requires a lab report to be handed in either before you leave the lab, or the following week.
- Labs 1 and 8 are each worth 2% of your final grade, Labs 2 – 5 are each worth 3%, Labs 6 – 7 are each worth 4.5%, and the group project report is worth 10%, for a total of 35% of your final grade.

### **Final Examination (35.00%)**

**Date:** Sat, Apr 14, 2:30 PM - , 4:30 PM, TBA

- The final examination will cover primarily materials not covered in the midterm examination but will include related topics dealt with in the labs.
- 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
- Any problems with examinations or questions arising from them must be resolved immediately.

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## **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.

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## **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/>

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# 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](http://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.

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