



# **BOT\*3410 Plant Anatomy**

Fall 2018

Section(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - August 24, 2018

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## **1 Course Details**

### **1.1 Calendar Description**

The intricate internal structure of plants is explored in this course. The development, pattern and significance of cells, tissues and organs will be emphasized as well as the histological and microscopical methods used to study them. The lab emphasizes interpretation of plant structure as it relates to function.

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

### **1.2 Course Description**

The intricate internal structure of plants is explored in this course. The development, pattern and significance of cells, tissues and organs will be emphasized along with the histological and microscopical techniques used to study them. The lab emphasizes interpretation of plant structure as it relates to function.

### **1.3 Timetable**

#### **LECTURES**

Lectures will be held in SSC 3315.

Lectures are scheduled on Tuesdays and Thursdays from 11:30 am – 12:50 pm.

The first lecture is scheduled for Thursday September 8. The last three lectures and/or lab slots will be used for project preparation and presentations. The last day of class is Thursday Nov.30.

#### **LABORATORIES**

Laboratories are held in SSC 3315.

Laboratories are scheduled on Tuesdays from 2:30 pm – 5:20 pm.

First Lab: Laboratories will commence on Tuesday, September 12.

## 1.4 Final Exam

There is no Final exam for this course. Two term tests will be held, tentative dates Oct 11 (Test 1) and Nov 15 (Test 2).

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## 2 Instructional Support

### 2.1 Instructor(s)

**Dr. Jaideep Mathur**

**Email:** jmathur@uoguelph.ca  
**Telephone:** +1-519-824-4120 x56636  
**Office:** SC1 4463

**Office Hours:** Dr. Mathur maintains an open door policy. Please feel free to contact him whenever you have course related questions or problems.

Dr. Jaideep Mathur obtained his B.Sc., M.Sc. and Ph.D. in Botany and spent the period between 1992 and 2004 as a scientist in various International institutions. His early research work resulted in providing a molecular-genetic basis for the presence and developmental role of Brassinosteroids, a group of plant hormones and was followed by his discovery of an actin related protein (ARP) 2/3 complex as a major regulator of plant cell shape development. Dr. Mathur's present research focuses on understanding plant development and interactions with the environment through the use of numerous cell biological and molecular-genetic tools. His lab is renowned Internationally for its expertise with fluorescent protein aided live-imaging of subcellular interactions. For more information visit <<https://mathurlab.github.io/>> .

### 2.2 Instructional Support Team

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

Dr. Chris J. 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\*3410 Lab Coordinator, he manages all aspects of the teaching laboratory. See the Lab Manual for further details.

### 2.3 Teaching Assistant(s)

**Teaching Assistant:** Mark Minnow PhD  
**Email:** mminow@uoguelph.ca

**Teaching Assistant:** Alexandra Ficht PhD  
**Email:** ficht@uoguelph.ca

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## 3 Learning Resources

### 3.1 Required Resource(s)

### **Laboratory Manual (Lab Manual)**

The Laboratory Manual will be available online through the Plant Anatomy CourseLink website. This manual includes all the necessary information for conducting lab exercises.

## **3.2 Recommended Resource(s)**

### **Teaching Plant Anatomy (Textbook)**

Teaching Plant Anatomy by Peterson, L. et al. 2008.

A copy of the textbooks will be available in the Library on a two-hour course reserve. Copies are also available for consultation in the lab.

On the Plant Anatomy CourseLink site, there will also be links to a number of useful websites.

### **Esau's Plant Anatomy (Textbook)**

Esau's Plant Anatomy, 3rd Ed. Ray Evert. 2006.

A copy of the textbooks will be available in the Library on a two-hour course reserve. Copies are also available for consultation in the lab.

On the Plant Anatomy CourseLink site, there will also be links to a number of useful websites.

## **3.3 Campus Resources**

The Academic Calendar is the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>

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

- Make an appointment with a program counsellor in your degree program.  
<http://www.bsc.uoguelph.ca/index.shtml> or  
<https://www.uoguelph.ca/uaic/programcounsellors>

***If you are struggling to succeed academically:***

- 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/>

***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/>

***If you have a documented disability or think you may have a disability:***

- The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: <https://www.uoguelph.ca/csd/>
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## 4 Learning Outcomes

### 4.1 Course Learning Outcomes

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

1. Proper identification of plant anatomical and morphological traits.
  2. Learning how to link plant structure with function and habitat.
  3. Enhanced observational skills.
  4. Advanced microscopy, and digital imaging skills.
  5. Maintaining comprehensive, research-oriented notes and observations.
  6. Effectively search for primary scientific literature.
  7. Communication skills from preparing written lab reports and a scientific research presentation.
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## 5 Teaching and Learning Activities

### 5.1 Learning Goals & Rationale

This course is designed to give students a working knowledge of the structure of vascular plants and introduce some of the methods used by plant anatomists to investigate plant structure. It is primarily a 'hands-on' laboratory course with cooperative, self-directed learning components. Students will have the opportunity to learn various microscopy techniques and apply these to a major project where they study plant structure as it relates to adaptation to the environment and its importance to humans.

Lectures and presentations will be given only to clarify topics pertinent to successfully completing the course. For the major "independent" project, an economically important plant provided to each student pair would be studied using the methods taught in class and laboratories. Completed assignments should include relevant images and diagrams with a written description of the findings. Further details on the assignments will be provided in class.

You will be conducting weekly lab exercises and your independent projects along with one partner. You will make one, final, oral (PowerPoint aided) presentation as a pair on your assigned project plant on a specific date towards the end of the semester. This will be followed by questions and discussion. The results of this project are based entirely on you and your partner's own evaluation of the anatomy of your plant. The lab reports and midterm exam will be considered and marked as an 'individual effort'.

## 5.2 Course Content

| Week #                                 | Dates          | Lecture topics   | Lab #   | Lab date |
|--|----------------|--|---------|----------|
| 1                                      | Sept 6         | Introduction to Plant Anatomy                          |         |          |
| 2                                      | Sept 11 & 13   | Tools, Techniques                                      | 1       | Sept 11  |
| 3                                      | Sept 18 & 20   | Techniques; Basic Cell types; Simple tissue; Epidermis | 2       | Sept 18  |
| 4                                      | Sept 25 & 27   | Primary Vascular tissue; Xylem & Phloem                | 3       | Sept 25  |
| 5                                      | Oct 2 & 4      | Primary growth of Stems; Roots                         | 4       | Oct 2    |
| 6                                      | Oct 11         | Secondary growth; Wood formation                       | -       | No lab   |
| <b>[Test #1 – OCT 11<sup>th</sup>]</b> |                |  |         |          |
| 7                                      | Oct 16 & 18    | Leaves and modifications                               | 5       | Oct 16   |
| 8                                      | Oct 23 & 25    | Flowers & Fruits                                       | 6       | Oct 23   |
| 9                                      | Oct 30 & Nov 1 | Ecology; Adaptation and specialized anatomy            | 7       | Oct 30   |
| 10                                     | Nov 6 & 8      | Economic & Applied Plant Anatomy                       | 8       | Nov 6    |
| 11                                     | Nov 13 &       | Project lab work                                       | Project | Nov 13   |

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**[Test #2 – NOV 15<sup>th</sup>]**

|    |             |                       |                     |
|----|-------------|-----------------------|---------------------|
| 12 | Nov 20 & 22 | Project lab work      | Project Nov 20      |
| 13 | Nov 27 & 29 | Project presentations | Project Nov 27 & 29 |

### 5.3 Important Dates

- Tests: Oct 11 and Nov 15
- Lab report grading: see lab manual
- Presentation for the independent project: Nov 27 or 29 The last date to drop this course, without academic penalty, is Friday November 2<sup>nd</sup> (the 40<sup>th</sup> class day).

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## 6 Assessments

### 6.1 Methods of Assessment

| Form of Assessment   | Weight of Assessment | Due Dates of Assessment                  | Course Content | Learning Outcomes Addressed |
|----------------------|----------------------|--|----------------|-----------------------------|
| Test #1              | 20% of total         | Oct 11 <sup>th</sup>                     | Lectures       | #1 to #2                    |
| Test #2              | 25% of total         | Nov 15 <sup>th</sup>                     | Lectures       | #1 to #2                    |
| Lab report grading   | 25% of total         | See lab manual                           | Laboratory     | #1 to #5                    |
| Project presentation | 30% of total         | Nov 28 <sup>th</sup> or 30 <sup>th</sup> | Laboratory     | #1 to #7                    |

### 6.2 Note

Your attendance and participation in all laboratory periods are necessary for completing and being successful in this course. Be aware that 55% of your total grade is derived from lab-related work. This includes submission of the laboratory reports on two occasions, delivering an oral presentation for the independent project, plus being in attendance for all the student presentations. Failure to submit or participate in any of these lab modules by the advertised due date will result in a mark of zero for that specific component. Clearly, your final mark will be a reflection of your overall enthusiasm and dedication to the lab work during the entire semester.

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## 7 Course Statements

### 7.1 Grading

If you are absent, do not participate, or do not submit by the due date one or more of the course assessments (quizzes, midterm, lab notebook grading, project presentations, project report), for legitimate medical or other authorized reasons, please make sure that you contact the instructor or lab coordinator at the earliest. Provide supporting documentation as soon as you are able to. Inability to inform within three days, or not providing valid documentation will result in a mark of zero for that specific assignment.

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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.
- 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: [Chemistry & Physics Help](#) and [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.
  - [Student Health Services](#) is located on campus and is available to provide medical attention.
  - 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](#).
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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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