



BOT*3410 Plant Anatomy

Fall 2021

Section(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - September 04, 2021

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-Requisites: 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

All lectures will be delivered online and recorded for asynchronous viewing.

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

The first - Introductory lecture is scheduled for Thursday September 9. The lecture and/or lab slots from Nov 19 to Dec 8 will be used for student presentations.

LABORATORIES

Laboratories will be offered remotely. Live laboratory discussions will be held primarily on

Microsoft Teams. (CourseLink Virtual Classroom is available as a secondary/backup video platform.) These discussions are hosted every **Tuesday from 2:30-5:20 PM, starting September 14.**

1.4 Final Exam

There is no Final exam for this course. Two term tests will be held during the scheduled class time 11.30 AM to 12.50 PM, tentative dates Oct 7 (Test 1) and Nov 11 (Test 2).

2 Instructional Support

2.1 Instructional Support Team

Instructor: Dr. Jaideep Mathur
Email: jmathur@uoguelph.ca
Telephone: +1-519-824-4120 x56636
Office: SC1 4463
Office Hours: Please feel free to contact Dr. Mathur by e mail 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/>> .

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.

2.2 Teaching Assistants

Teaching Assistant (GTA):	Nathan Doner	Caroline Reisiger
Email:	donern@uoguelph.ca	creisige@uoguelph.ca
Telephone:	+1-519-824-4120	

3 Learning Resources

3.1 Required Resources

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 Resources

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.
- 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.

<https://www.uoguelph.ca/counselling/>
<https://www.uoguelph.ca/studenthealthservices/clinic>
<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/>

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 9	Introduction to Plant Anatomy		
2	Sept 14 &	Tools, Techniques	1	Sept 14

Week #	Dates	Lecture topics	Lab #	Lab date
	16			
3	Sept 21 & 23	Techniques; Basic Cell types; Simple tissue; Epidermis	2	Sept 21
4	Sept 28 & 30	Primary Vascular tissue; Xylem & Phloem	3	Sept 28
5	Oct 5 & 7	Primary growth of Stems; Roots [Test #1 – OCT 7th]	4	Oct 5
6	Oct 14	Secondary growth; Wood formation	5	No lab
7	Oct 19 & 21	Leaves and modifications	-	Oct 19
8	Oct 26 & 28	Flowers & Fruits	6	Oct 26
9	Nov 2 & 4	Ecology; Adaptation and specialized anatomy	7	Nov 2

Week #	Dates	Lecture topics	Lab #	Lab date
10	Nov 9 & 11	Economic & Applied Plant Anatomy [Test #2 – NOV 11th]	8	Nov 9
11	Nov 16 & 18	Work on Project presentations	Project	Nov 16
12	Nov 18 & 23	Student presentations	Presentations	Nov 23
13	Nov 25, 30 & Dec 2		Presentations	Nov 25, 30 & Dec 2

5.3 Important Dates

- Tests: Oct 7 and Nov 11
- Lab report grading: see lab manual
- Presentation for the independent project: Nov 18 to Dec 2

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 7 th	Lectures	#1 to #2
Test #2	25% of total	Nov 11 th	Lectures	#1 to #2
Lab report grading	30% of total	See lab manual	Laboratory	#1 to #5
Student presentation	25% of total	Nov 23 to Dec 7 th	Student research	#1 to #7

6.2 Note

Your attendance and participation is necessary for getting the maximum out of this course. Be aware that 55% of your total grade is derived from the virtual labs and self motivated research on the topic of your presentation.

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.

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.selfregulationskills.ca/>

8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964),

and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.
(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

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 grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

9.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

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.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

9.6 Academic Integrity

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 encourages academic integrity. 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.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, 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 that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
