

COURSE SYLLABUS – BIOLOGY 222 – THE LIVING PLANT

COURSE TITLE:	BIOL 222 The Living Plant
TERM:	Term 2 [Winter 2023]
CLASS TIME:	MWF 11:30am-12:20pm
CLASS LOCATION:	Thorvaldson Building, Room 105
LAB LOCATION:	Thorvaldson Building, Room 132
DELIVERY:	In-person (Lecture, Lab).
COURSE CREDITS:	3.0
FIRST DAY OF CLASS	January 4, 2023
LAST DAY OF CLASS:	April 5, 2023
WEBSITE:	Canvas platform at USask
INSTRUCTORS	Dr. Chris Ambrose, Dr. Byung-Kook (Brian) Ham, Ms. Gillian Murza

Lab Times

Section 1	Mondays	1:30 PM - 4:20 PM
Section 2	Mondays	6:00 PM - 8:50 PM
Section 3	Tuesdays	8:30 AM - 11:20 AM
Section 4	Tuesdays	1:30 PM - 4:20 PM
Section 5	Wednesdays	1:30 PM - 4:20 PM
Section 6	Wednesday	6:00 PM - 8:50 PM
Section 7	Thursdays	8:30 AM - 11:20 AM
Section 8	Thursdays	1:30 PM - 4:20 PM
Section 9	Thursdays	06:00 PM - 08:50 PM

Instructors

	Lecturers	Lab Coordinator
Prof. Chris Ambrose Room 220.7 Collaborative Science Research Building Telephone: (306) 966-4409 chris.ambrose@usask.ca	Prof. Byung-Kook (Brian) Ham Room 220.9 Collaborative Sciences Research Building Telephone: (306) 966-4439 byungkook-brian.ham@gifs.ca	Ms. Gillian Murza, M.Sc. Rm 94 Murray Building Telephone: (306)-966-4425 gillian.murza@usask.ca

Office Hours: By appointment.

Course Description

We will examine the organization of the plant body and how cells, tissues, and organs function and contribute to growth, development, and reproductive success. The course will deal broadly with plant biology, emphasizing flowering plants, and providing the foundation for senior courses on plants.

Prerequisite(s): BIOL 120.3.

Note: BIOL 121.3 is strongly recommended. Students with credit for BIOL 202.3 or BIOL 205.3 may not take this course for credit.

Mandatory Completion of USask Academic Integrity Tutorial:

Value: 0% of final grade but completion required as a lab prerequisite

Date: Due on the first day of week 2 (Monday January 9 at 4:30 pm)

Format: Online tutorial here: <https://libguides.usask.ca/AcademicIntegrityTutorial>

Description: We want to ensure a learning and teaching environment with a high standard of academic integrity for BIOL 222. Scientists and other professionals are held to these high standards, and it is appropriate that we ensure this in our courses. The U of S has developed some outstanding web-based resources to help students understand and practice academic integrity. This includes an opportunity to complete three modules dealing with various aspects of academic integrity. You will be sent a certificate on completion of each of the modules. As a BIOL 222 student, you are required to complete the **first module** and upload your certificate as a Canvas Assignment. It is acceptable if you have received these certificates as a requirement in other courses. This assignment will be graded as complete/incomplete (i.e., it does not contribute to your final course grade) but it serves as a prerequisite for the Canvas module containing the BIOL 222 Lab content. The certificate must be uploaded and graded before you will be able to access the BIOL 222 Lab content. We also recommend that you complete the other two modules.

Course Format Overview

This course consists of 50 minutes of lecture, three mornings per week, beginning on January 4, 2023. The first lab starts on the week of January 16, 2023 (week 3). Students must attend the lab section for which they have registered on PAWS. Lectures will not be recorded.

Course Materials and Resources

Lectures

Instructors will make lecture notes available to students on Canvas learning platform at USask, which students can access using Course Tools. Students are highly encouraged to attend all lectures to take their own notes.

Labs

There are 8 different topics plus a week of review lab, such that most weeks of the course will feature a lab exercise to be completed in-person. Directions that guide completion of each lab will be made available to all students early in the week of that particular topic, such that students can examine those guidelines before their enrolled lab section. Further details will be provided within your lab section.

Textbook

To supplement the course material, a recommended (not required) textbook is "*Raven – Biology of Plants*", 8th edition, W.H. Freeman & Company, by R.F. Evert and S.E. Eichhorn. Note that acquisition of an earlier version of this textbook is satisfactory.

Lab Manual

The 2022 version of the Lab Manual is essential for successful completion of the labs in this course. The Lab Manual is already available for purchase from the U of S Bookstore. It is also a great supplement for the lecture component because it has excellent and concise introductions / backgrounds, vocabulary lists, and images. It is very useful.

Class Schedule

Week # Dates	Lecture #	Lecture Topics	Instructor
Week 1 Jan 4-6	L1 – L2	Introduction – The Living Plant Basic morphology of vascular plants	Dr. Ambrose [Plant anatomy]
Week 2 Jan 9-13	L3 – L5	Plant cell structure and function	
Week 3 Jan 16-20	L6 – L8	Tissues, cell types, meristems, primary and secondary growth.	
Week 4 Jan 23-27	L9 – L11	Tissues, cell types, meristem, primary and secondary growth. Leaves.	
Week 5 Jan 30 - Feb 3	L1 – L3	Leaf evolutionary trends, Pigments and Photosynthesis (Part I).	Dr. Ham [Plant physiology I]
Week 6 Feb 6-10	L4 L5 midterm	Leaves and Photosynthesis (Part II). Pre-midterm review/question&answer (Ham and Ambrose) Friday February 10: Mid-term Exam , covers all of Dr. Ambrose's lectures and Dr. Ham's first three lectures.	
Week 7 Feb 13-17	L6 - 8	Leaves and Photosynthesis (Part II). Root structure; Transport.	
Week 8 Feb 20-24		WINTER MID-TERM BREAK – No classes scheduled!	
Week 9 Feb 27 – Mar 3	L9 – L11	Leaves and Photosynthesis (Part II). Root structure; Transport.	Dr. Ham [Plant physiology I continued]
Week 10 Mar 6-10	L12 – L14	Plant reproduction Flowers Fruit	Dr. Ambrose [Plant Reproduction]
Week 11 Mar 13-17	L15 – L17	Reproductive mechanisms Embryogenesis Sexual vs. asexual reproduction	
Week 12 Mar 20-24	L12 – L14	Plant nutrition.	Dr. Ham [Plant Physiology II]
Week 13 Mar 27-31	L15 – L17	Sensing and signal transduction in plants; Plant hormones (Part I).	
Week 14 Apr 3-5	L18 review	Plant hormones (Part II); Plant stress responses (abiotic and biotic stresses). Last class – Wednesday April 5, final course review/question&answer (Ham and Ambrose)	

Lab Schedule

Week	Dates	Lab No.	Topic
1	Jan. 4-6	NO LAB	NO LAB
2	Jan. 9-13	NO LAB	NO LAB
3	Jan.16-20	Lab 1	Introduction to Plants and Lab Skills
4	Jan. 23-27	Lab 2	Plant Tissue Systems and Stems
5	Jan. 30-Feb. 3	Lab 3	Embryos, Meristems, Primary and Secondary Growth
6	Feb. 6-10	Lab 4	Leaves and Photosynthesis
7	Feb. 13-17	Lab 5	Roots
8	Feb. 20-24	NO LAB	Mid-Term Break
9	Feb. 28-Mar. 4	Lab 6	Transport
10	Mar. 6-10	Lab 7	Flowers & Fruit
11	Mar. 13-17	Lab 8	Sexual Reproduction
12	Mar. 20-24	Review	Review
13	Mar. 27-31	Final Lab Exam	Final Lab Exam
14	Apr. 3-5	NO LAB	NO LAB

Exam Schedule and Grading Scheme Overview

Lecture Midterm Exam – in class on Friday, February 10, 2023, 11:30 am – 12:30 pm	20%
Lecture Final Exam – arranged by the U of S Registrar; April 10-29, 2023	40%
Laboratory Exam – within your lab section, during the week of March 27-31, 2023	20%
Laboratory Assignments, Quizzes, Lab Reports – as assigned throughout the term	20%
Total	100%

Exam and Assignment Details

Lecture Midterm Exam

Value: 20% of the final course grade.
Date: Friday, February 10, 2023, 11:30-12:20, Thorvaldson room 105
Duration: 50 minutes.
Format: multiple choice
Description: Coverage will include all of Dr. Ambrose's lectures to date (Lectures 1-11), and Dr. Ham's first three lectures. Note that no phones, laptops, tablets or other electronic or written materials are allowed. Please bring your valid U of S student card plus an HB pencil and eraser.

Lecture Final Exam

Value: 40% of the final course grade.
Date: Consult the Term 2 Exam Schedule (April 10-29, 2023), arranged by the Registrar. **Students must avoid making prior travel, employment, or other commitments for this period.** Students are encouraged to review all [University examination policies and procedures](#).
Duration: Three hours
Format: Multiple choice, 100 questions.
Description: This exam is comprehensive in that it will cover all lecture material. However, material delivered since the Lecture Midterm Exam will be emphasized. Note that no phones, laptops, tablets or other electronic or written materials are allowed. Please bring your valid U of S student card plus an HB pencil and eraser.

Laboratory Assignments

Value: 20% of the final course grade.
Date: Items are assigned throughout the term.
Format: Two quizzes, one written report, and 3 or 4 hand-in assignments.
Description: Each student will work independently (unless specified otherwise) to prepare these items that relate to the laboratory (practical) portion of the course.

Laboratory Final Exam

Value: 20% of the final course grade.
Date/Time: Within your regular lab period, during the week of March 27 – March 31, 2023.
Format: Combination of spot test identifications plus practical exercises such as dissections, hand-sectioning, staining, drawing, and labeling.
Description: This exam is comprehensive, its coverage including the weekly laboratory exercises and demonstration materials presented during Labs 1-8. To help prepare for this exam, students are strongly encouraged to take advantage of their Lab review session (in lab during week of March 20 – 24, 2023).

Accessing exam scores

Exam scores will be made available to the student, using Canvas. However, neither the graded Lecture Midterm exam, nor the Lab or Lecture Final Exams, shall be returned by the instructor(s) to the student. The lab report and the weekly lab worksheets/assignments will be annotated and returned to the student.

Learning Outcomes for BIOL 222

Upon successful completion of this course, you will:

1. Understand both basic and advanced functions of plants, spanning the mechanisms and strategies of their development, growth, physiology, reproduction, and interactions with their environment.
2. Show proficiency in the ability to understand and interpret plant parts (e.g., stems, leaves, roots, flowers), including application of stains (dyes) that help distinguish cell types and tissues such that you can appreciate the differentiation in plant organs that translates to the diverse functional role of plant cells and tissues within the plant body.
3. Learn how to correctly operate microscopes (compound, dissecting) plus utilize an image-capture system that facilitates the production of images (e.g., stained stem in cross-section) which can then be labeled to correctly identify the section's anatomical features, such as various tissues and cell types.
4. Have a basic understanding that plants are diverse (e.g., not all plants reproduce in the same way - seeds versus non-seed plants), although by necessity the lectures and labs will emphasize angiosperms (flowering plants), which are the most dominant plant group that students will encounter.
5. Apply Microsoft Office programs like Excel Graphics and Powerpoint to prepare simple graphs of plant-science data.
6. Learn to work efficiently as an individual, and within groups.

Criteria That Must Be Met to Pass this Course

Students are required to write the Lecture Mid-term Exam, the Lecture Final Exam and the Lab Final Exam in order to be eligible to pass this course.

Students who do not write the Lecture Final Exam in April 2023, will be assigned a final course grade of 49%, or lower according to their performance on the course's other term work, along with a grade comment of INF (Incomplete Failure). The final grade will be adjusted only when the student writes the Deferred Lecture Final Exam (see below).

Missed Exam Policy

The Lecture Mid-term, Lab Final Exam, and Lecture Final Exam should be written, individually, on the dates scheduled above.

If a student is unable to write a Lecture Mid-term or the Final Lab Exam through no fault of his or her own for a medical or other valid reason, **the student must contact the instructor or lab coordinator, respectively, by email within 24 hrs of the date of the missed exam**, in order to explain her/his absence and to initiate discussions about a possible Deferred Lecture Mid-term, or Final Lab Exam. Permission may then be granted for the student to write a deferred exam.

The Examinations Division at U of S will schedule final course examinations between April 10-29, 2023. Students should therefore avoid making travel, employment, or other commitments for this period. **Unlike for a missed Lecture Mid-term, or the Lab Final Exam, students who miss the Lecture Final Exam must contact their College to apply for permission to write a Deferred Lecture Final Exam in mid-June, 2023.** Deferred exams may utilize a different format than the regular exam, at the sole discretion of the instructor(s). Students are encouraged to review all University examination policies and procedures: <https://policies.usask.ca/policies/academic-affairs/academic-courses.php#7Examinations>

Instructor Profiles

Dr. Ambrose is an associate professor in the Department of Biology. In addition to BIOL 222, he teaches BIOL 325 – Plant Cells and Tissues, and BIOL 120 – The Nature of Life. His area of research is plant cell and developmental biology. Dr. Ham is an assistant professor in the Department of Biology, and is a Research

Chair in the Global Institute of Food Security (GIFS) at U of S. He also teaches BIOL 331 – Plant Physiology. His specialized area of research are plant molecular biology and physiology. Ms. Murza is responsible for coordinating all aspects of the laboratories for BIOL 222. Your lab group will also be assigned a laboratory Teaching Assistant (TA) who will help you during your lab period. TAs are senior undergraduate or graduate students at the U of S who work under the supervision of Ms. Murza.

Treaty Acknowledgement

As we engage in Remote Teaching and Learning, we would like to acknowledge that the Saskatoon campus of the University of Saskatchewan is on **Treaty Six Territory** and the **Homeland of the Métis**. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. We would also like to recognize that some may be attending this course from other traditional Indigenous lands. We ask that you take a moment to make your own Land Acknowledgement to the peoples of those lands. In doing so, we are actively participating in reconciliation as we navigate our time in this course, learning and supporting each other.

Recording of Course Material

Lectures will not be recorded, so come to class. Students also are not allowed to record any aspect of this course, except with the permission of the instructors or as provided for by arrangements with the Office of Access and Equity Services (AES).

Copyright

All previously published material used in this course is made available under the fair-use provisions of Canadian copyright legislation. The instructor retains copyright of his or her own work. Students shall refrain from redistributing any material provided to them, except upon receipt of permission of the instructor.

Student Feedback

The Department of Biology or the instructors may survey students regarding the course. This assessment is generally done near the end of the term.

Integrity Defined (from the Office of the University Secretary)

Prepare for Integrity - Students are expected to act with academic integrity.

- Students are encouraged (required for BIOL 222) to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community (tutorial link: <https://libguides.usask.ca/AcademicIntegrityTutorial>) .
- Students can access campus resources that support development of study skills, time and stress management, and ethical writing practices important for maintaining academic integrity and avoiding academic misconduct.

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct (<https://governance.usask.ca/student-conduct-appeals/academic-misconduct.php> - [StudentAcademicMisconductRegulations](#)) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<https://governance.usask.ca/student-conduct-appeals/non-academic-misconduct.php>)

For more information on what academic integrity means for students see the Academic Integrity section of the University Library Website at: <https://library.usask.ca/academic-integrity.php>

You are encouraged to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community - <https://libguides.usask.ca/AcademicIntegrityTutorial>

There are also valuable resources on the Integrity Matters website: <https://academic-integrity.usask.ca/>

Examinations through the Office of Access and Equity Services (AES)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals at any time. Those students who are registered with AES with mental health disabilities and who anticipate that they may have responses to certain course materials or topics, should discuss course content with their instructors prior to course add / drop dates. In order to access AES programs and supports, students must follow AES policy and procedures. . In order to access AES programs and supports, students must follow AES policy and procedures. For more information or advice, visit <https://students.usask.ca/health/centres/access-equity-services.php>, or contact AES at 306-966-7273 or aes@usask.ca.

Students registered with AES may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

Student Supports

Academic support for students

Visit the [Learning Hub](#) to learn how the University Library supports undergraduate and graduate students. Attend online or in-person workshops, review online resources or book 1-1 appointments for help with:

- First year experience
- Research
- Study strategies and skills
- Writing
- Math and Statistics

Teaching, Learning and Student Experience

The Teaching, Learning and Student Experience Unit (TLSE) focuses on providing developmental and support services and programs to students and the university community. For more information, see <https://students.usask.ca/>

College Supports

Students in Arts & Science are encouraged to contact the Undergraduate Student Office and/or the Trish Monture Centre for Success with any questions on how to choose a major; understand program requirements; choose courses; develop strategies to improve grades; understand university policies and procedures; overcome personal barriers; initiate pre-career inquiries; and identify career planning resources. Contact information is available at: (<http://artsandscience.usask.ca/undergraduate/advising/>)

Financial Support

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central at <https://students.usask.ca/student-central.php>.

Aboriginal Students' Centre

The Aboriginal Students' Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, bringing Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC's Facebook page (<https://www.facebook.com/aboriginalstudentscentre/>) to learn more.

International Student and Study Abroad Centre

The International Student and Study Abroad Centre (ISSAC) supports student success and facilitates international education experiences at USask and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students in their transition to the University of Saskatchewan and to life in Canada. ISSAC offers advising and support on matters that affect international students and their families and on matters related to studying abroad as University of Saskatchewan students. Please visit students.usask.ca or updates.usask.ca for more information.

Recommended Technology for Remote Learning

Students are reminded of the importance of having the appropriate technology for remote learning. The list of recommendations can be found at <https://students.usask.ca/remote-learning/tech-requirements.php>.

University of Saskatchewan Grading System (for undergraduate courses)

Exceptional (90-100) A superior performance with consistent evidence of

- a comprehensive, incisive grasp of the subject matter;
- an ability to make insightful critical evaluation of the material given;
- an exceptional capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

Excellent (80-90) An excellent performance with strong evidence of

- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a very good capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

Good (70-79) A good performance with evidence of

- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative and/or logical thinking;
- a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.

Satisfactory (60-69) A generally satisfactory and intellectually adequate performance with evidence of

- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material;

- a moderate ability to examine the material in a critical and analytical manner.

Minimal Pass (50-59) A barely acceptable performance with evidence of

- a familiarity with the subject material;
- some evidence that analytical skills have been developed;
- some understanding of relevant issues;
- some familiarity with the relevant literature and techniques;
- attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner which are only partially successful.

Failure <50 An unacceptable performance.

From: <http://students.usask.ca/academics/grading/grading-system.php>

More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at: <http://policies.usask.ca/policies/academic-affairs/academic-courses.php>