UNIVERSITY OF SASKATCHEWAN

Department of Biology

COURSE SYLLABUS – BIOLOGY 222 – THE LIVING PLANT

COURSE TITLE:	BIOL 222 The Living Plant
TERM:	Term 2 [Winter 2022]
CLASS TIME:	MWF 11:30am-12:20pm
CLASS LOCATION:	Online via Zoom in Canvas [Jan 10 – Jan 21]
	Thorvaldson Building, Room 105 [Jan 24 – Apr 8]
LAB LOCATION:	Thorvaldson Building, Room 132
DELIVERY:	In-person (Lecture, Lab)
COURSE CREDITS:	3.0
FIRST DAY OF CLASS	January 10, 2022
LAST DAY OF CLASS:	April 8, 2022
WEBSITE:	Canvas platform at USask
INSTRUCTORS	Dr. Chris Ambrose, Dr. 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

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 by Friday January 21 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 10, 2022. The first lab starts on the week of January 24, 2022 (week 3). Students must attend the lab section for which they have registered on PAWS.

Because of the COVID-19 pandemic and associated concerns for the safety of all students and staff, this course is remotely delivered for the first two weeks (from January 10 to 21). Dr. Ambrose will give lectures live via zoom during the normal class time (MWF 11:30 – 12:20). If the current course restrictions remain in place, Dr. Ham will also deliver lectures live via zoom during the normal class time.

The University's current plan is to return to in-person classes starting on the third week (January 24), but is subject to change depending on the circumstances as they arise. Students will be informed of any decisions regarding this matter.

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. It is available as an e-copy or a hard-copy from the U of S Bookstore. (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 10-14	L1 – L3	Introduction – The Living Plant Basic morphology of vascular plants	Dr. Ambrose [Plant anatomy]
Week 2 Jan 17-21	L4 – L6	Plant cell structure and function	
Week 3 Jan 24 - 28	L7 – L9	Tissues, cell types, meristems, primary and secondary growth.	
Week 4 Jan 31 – Feb 4	L10 – L11	Tissues, cell types, meristem, primary and secondary growth. Leaves.	
Week 5 Feb 7 -11	L1 – L3	Leaf evolutionary trends, Pigments and Photosynthesis (Part I).	Dr. Ham [Plant physiology I]
Week 6 Feb 14 - 18	L4 -review **-midterm**	Leaves and Photosynthesis (Part II). Pre-midterm review/question&answer (Ham and Ambrose) **Friday February 18: Mid-term Exam (Covers All Dr. Ambrose's lectures and Dr. Ham's first three lectures**	
Week 7 Feb 21 - 25	**WINTER MID-TERM BREAK – No classes scheduled!**		
Week 8 Feb 28 - Mar 4	L5 – L7	Leaves and Photosynthesis (Part II). Root structure; Transport.	Dr. Ham [Plant physiology I continued]
Week 9 Mar 7-11	L12 – L14	Plant reproduction Flowers Fruit	Dr. Ambrose [Plant Reproduction]
Week 10 Mar 14-18	L15 – L17	Reproductive mechanisms Embryogenesis Sexual vs. asexual reproduction	
Week 11 Mar 21-25	L8 – L10	Plant nutrition.	Dr. Ham [Plant Physiology II]
Week 12 Mar 28 – Apr 1	L11 – L13	Sensing and signal transduction in plants; Plant hormones (Part I).	
Week 13 Apr 4 – Apr 8	L14 – L15 -review	Plant hormones (Part II); Plant stress responses (abiotic and biotic stresses). **Last class – April 8, final course review/question&answer (Ham and Ambrose)**	

Lab Schedule

Dates	Lab #	Topic
Week 1 Jan 10-14	**NO LAB**	
Week 2 Jan 17-21	**NO LAB**	
Week 3 Jan 24 - 28	Lab 1	**Introduction to Plants and Lab Skills**
Week 4 Jan 31 – Feb 4	Lab 2	**Plant Tissue Systems and Stems**
Week 5 Feb 7 -11	Lab 3	**Embryos, Meristems, Primary and Secondary Growth**
Week 6 Feb 14 – 18	Lab 4	**Leaves and Photosynthesis**
Week 7 Feb 21 – 25	**Mid-Term Break – NO LAB!**	
Week 8 Feb 28 – Mar 4	Lab 5	**Roots**
Week 9 Mar 7 – 11	Lab 6	**Transport**
Week 10 Mar 14 – 18	Lab 7	**Flowers, Fruit, and Sexual Reproduction**
Week 11 Mar 21 – 25	Lab 8	**Sexual Reproduction and Vegetative Reproduction**
Week 12 Mar 28 – Apr 1	Review	**Review**
Week 13 Apr 4 – Apr 8	**Final Lab Exam**	**Final Lab Exam (taken in lab)**

Exam Schedule and Grading Scheme Overview

Lecture Midterm Exam – in class on Friday, February 18, 2022, 11:30 am – 12:30 pm	20%
Laboratory Exam – within your lab section, during the week of Apr 4 – Apr 8, 2022	20%
Lecture Final Exam – arranged by the U of S Registrar; April 9-30, 2022	40%
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 18, 2022, 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 9-30, 2022), 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: Assignments, Quizzes, Lab Reports.
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 April 4 – April 8, 2022.
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 28 – April 1, 2022).

Accessing exam scores

Exam scores will be made available to the student, using Canvas. However, neither the graded Lecture Mid-term 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.

BIOL 222 Learning Outcomes

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 2022, 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 9-30, 2022. 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, 2022.** 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.

Learning and Teaching Context

The past 24 months have been extremely difficult, with trauma and loss experienced by many in our university community and beyond. Transitioning out of the pandemic period is a change and may be challenging, and that all students in this course should interact with empathy and care. Important guidelines are included in the next section to help guide everyone through the term safely.

Important guidelines for this transition term:

During this transition term it is important that we undertake in-person elements of this class safely. In order to do this the university has developed a set of expectations and safety protocols that all students must adhere to if they are to engage in in-person activity.

Throughout the term:

➔ **Protect the pack:** Right now, the impact of student choices and activities when not on campus cannot be separated from time spent on campus. In order to "protect the pack", the university is asking all students who are doing in-person work to be mindful and do whatever possible to lower the risk that you will contract COVID-19 and bring it onto campus.

➔ **Know what is required and expected of you:** One of the critical lessons learned in dealing with COVID-19 is knowing that situations can change and we must be flexible and ready to adjust our safety protocols. Instead of listing all of the relevant information in your course outline, the university has created a webpage where all up-to-date information around returning to campus is listed. **You are responsible** for **regularly** checking the health and safety guidelines https://covid19.usask.ca/about/safety.php#Expectations and knowing what is expected of you throughout the fall term.

➔ **Follow all guidance:** Students are expected to follow all guidance provided by the University's Pandemic Recovery/Response Team (PRT), College/Department, professors, lab instructors, TAs, and any other staff member involved in the in-person academic program activities (e.g., Protective Services, Safety Resources).

➔ **Key channels of communication**: If there is a need for the class to pause meeting in-person for a period of time you will be notified. If this occurs, you will be provided with detailed information on what you will need to do in place of the in-person class sessions (e.g., read content posted in Canvas, complete learning activities in Canvas). All information will be notified through Canvas system.

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. 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)

The University of Saskatchewan is committed to the highest standards of academic integrity (https://academic-integrity.usask.ca/). Academic misconduct is a serious matter and can result in grade penalties, suspension, and expulsion.

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.

Responses to Misconduct

Students are expected to be familiar with the academic misconduct regulations (https://governance.usask.ca/student-conduct-appeals/academic-misconduct.php#About).

- Definitions appear in Section II of the academic misconduct regulations.
- The academic misconduct regulations apply regardless of type of assessment or presence of supervision during assessment completion.
- Students are advised to ask for clarification as to the specific expectations and rules for assessments in all of their courses.
- Students are urged to avoid any behaviour that could result in suspicions of cheating, plagiarism, misrepresentation of facts. Students should note that posting copyrighted course materials (e.g., notes, questions, assignments or exams) to third party websites or services or other forum or media without permission is an academic or non-academic misconduct offense.

Non-academic offenses are dealt with under the Standard of Student Conduct in NonAcademic Matters and Regulations and Procedures for Resolution of Complaints and Appeals.

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 the Office of 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. In order to access AES programs and supports, students must follow AES policy and procedures. For more information, check https://students.usask.ca/health/centres/disability-services-for-students.php#Registration or contact the AES

Office at 966-7273 or aes@usask.ca. Students registered with AES may request alternative arrangements for the Term's Quizzes, the Lab Final Exam, and/or the Lecture Final Exam. However, students must arrange such accommodations by the deadlines established by AES. The instructor(s) shall provide the necessary quiz or Final Exam for students who are being accommodated by AES.

Student Supports

Student Learning Services

Student Learning Services (SLS) offers assistance to U of S undergrad and graduate students. For information on specific services, please see the SLS web site here.

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, brining 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