UNIVERSITY OF SASKATCHEWAN

COURSE SYLLABUS

COURSE TITLE:	BIOL 331 Plant Physiology		
COURSE CODE:	82699	**TERM:**	Fall 2023
COURSE CREDITS:	3.0	**DELIVERY:**	Lecture & Practicum (Lab)
CLASS SECTION:	01	**START DATE:**	September 6th, 2023
CLASS LOCATION:	Geology 165	**LAB LOCATION:**	G74B Thorvaldson Building
CLASS TIME:	MWF 8:30 AM to 9:20 AM	**LAB TIME:**	Thursdays 1:30PM to 5:20PM
WEBSITE:	Via Course tool (Canvas)		Fridays 1:30PM to 5:20PM

Course Description

This course examines aspects of plant physiology including water relations, utilization of mineral nutrition, translocation, photosynthesis and respiration.

Prerequisites: Biology 222

Land Acknowledgement

As we gather here today, we 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 recognize that in the course of your studies you will spend time learning in other traditional territories and Métis homelands. We wish you safe, productive and respectful encounters in these places.

Instructor Information

Contact Information

Prof. Dr. Byung-Kook (Brian) Ham **Instructor**	#220.9 Collaborative Sciences Research Building	(306) 966-4439 byungkook-brian.ham@usask.ca
Jacey Bell **Lab Coordinator**	#91 Murray Building	(306) 966-4493 jacey.bell@usask.ca

Office Hours

By appointment

Instructor Profile

Dr. Ham is a faculty member in the Department of Biology at University of Saskatchewan and also affiliated with the Global Institute for Food Security (GIFS) as a research chair.

Learning Outcomes

By the completion of this course, students will be expected to:

1. Gain an understanding of the main physiological concepts that control over plant growth and development.
2. Understand the correlation between plant physiological fundamentals and other fields in biology
3. Learn aspects of plant physiology by performing hands-on experiments: Analyze and communicate the results.
4. Apply plant physiological processes to explain solutions that plants face many environmental challenges.

Information on literal descriptors for grading at the University of Saskatchewan and more can be found in the Academic Courses Policy on course delivery, examinations and assessment of students learning: http://students.usask.ca/academics/grading/grading-system.php

Please note: There are different literal descriptors for undergraduate and graduate students.

The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: https://teaching.usask.ca/about/policies/learning-charter.php

Course Overview

This course comprises 50 minutes lecture, three times per week, **beginning on September 6th, 2023**. And this class includes **a weekly lab session, starting on September 14th and 15th, 2023**. The course provides students with a broad range of principles in plant physiology: water relations, xylem and phloem-mediated transport, photosynthesis, respiration, mineral nutrition and plant hormones.

Class Schedule

Water Balance Sep, 6-25

Components of water potential;
Osmosis;
Water movement in plants;
Atmosphere-plant-soil continuum;
Plant Response to water stress;
Energy balance (plant and environment) and water stress;

Mineral Nutrition and Nutrient Assimilation Sep, 27-Oct, 11

Plant mineral nutrition;

Solute Transport Oct, 13-27

Principles of solute transport in plants;
Transport in roots;
Phloem transport;

Photosynthesis Oct, 30 - Nov, 27
Carbon metabolism – C_3 and C_4;
Control of carbon allocation;

Respiration Nov, 29 - Dec, 1
Glycolysis;
Function of mitochondria;

Plant Hormone (Time permitting) Dec, 4– Dec, 6

Final Exam Review Dec, 8

Final Exam

Midterm and Final Examination Scheduling

Midterm Exam Review Oct, 16

Midterm Exam Oct, 18

Final examinations may be scheduled at any time during the examination period (**Dec, 9 – Dec, 23**); **students should therefore avoid making prior travel, employment, or other commitments for this period.** If a student is unable to write an exam through no fault of his or her own for medical or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be given. Students are encouraged to review all examination policies and procedures: **http://students.usask.ca/academics/exams.php**

Length and Mode of Final Examination (where appropriate)

The final examination will be 3 hours in length and consists of short and long answer, multiple choice and multiple answers.

Required Resources

Readings/Textbooks

Plant Physiology and Development, E-text, 7th edition by Taiz, Zeiger, Møller and Murphy. Sinauer Publishing

Textbooks are available from the University of Saskatchewan Bookstore:
https://bookstore.usask.ca/students.php

Downloads
All course materials will be available in the course tool (Canvas)

Supplementary Resources
The instructor and lab coordinator will post a lab manual and schedule to the course tool (Canvas).

Grading Scheme

Mid-term exam	30
Final term exam	40
Lab reports	30
Total	100%

Evaluation Components

Midterm Exam:

Value: 30% of final grade
Date: At the lecture time of October 18, 2023.
Length: 50 min
Type: Combination of multiple choice, multiple answers and answering written questions.
Description: Based on all lecture topics before the mid-term exam. **Note that no phone, laptop, tablet or other electronic or textbook are allowed**. Students should bring their valid U of S student identify card with pencils and erasers. This exam must be completed by students, individually (any remote or on-line exam will not be available to students).

Final Exam
Value: 40% of final grade
Date: Consult Final Exam Schedule
Length: 3 hours
Type: Combination of multiple choice, multiple answers and answering written questions.
Description: The final exam is comprehensive in that it will cover all lecture materials. However, lecture topics delivered after the midterm exam will be emphasized. **Note that no phone, laptop, tablet or other electronic or textbook are allowed**. Students should bring their valid U of S student identify card with pencils and erasers. This exam must be completed by students, individually (any remote or on-line exam will not be available to students). Students must avoid making prior travel, employment, or other commitments for this period.

Laboratory Reports
Value: 30% of final grade
Date: See Laboratory Schedule

Type: Written lab reports
Description: Students will prepare written lab reports with the desired format.

Criteria That Must Be Met to Pass

Students must complete writing **Midterm exam** and **Final exam** in order to pass this course. The final grade will be adjusted only when the student writes the Deferred Lecture Final Exam.

Attendance Expectations

Students should attend all scheduled lab classes and complete all lab experiments during the lab periods. There will be no scheduled make-up labs. Students should submit lab reports on time; late reports will be considered for a reduction in grade (10% reduction/day); no submission of lab reports without a valid excuse will cause a grade of "zero". If students are not able to attend scheduled lab classes, students should contact the lab coordinator (Jacey Bell).

Recording of the Course

This course will not be recorded. Students will be prohibited from recording the course. Students with approval from Access and Equity Services can be discussed with the instructor (Prof. Dr. Byung-Kook Ham) to access lecture materials.

Copyright

Course materials are provided to you based on your registration in a class, and anything created by your professors and instructors is their intellectual property and cannot be shared without written permission. If materials are designated as open education resources (with a creative commons license) you can share and/or use in alignment with the CC license. This includes exams, PowerPoint/PDF slides and other course notes. Additionally, other copyright-protected materials created by textbook publishers and authors may be provided to you based on license terms and educational exceptions in the Canadian Copyright Act (see http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html).

Before you copy or distribute others' copyright-protected materials, please ensure that your use of the materials is covered under the University's Fair Dealing Copyright Guidelines available at https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php. For example, posting others' copyright-protected materials on the open web is not covered under the University's Fair Dealing Copyright Guidelines, and doing so requires permission from the copyright holder.

For more information about copyright, please visit https://library.usask.ca/copyright/index.phpwhere there is information for students available at https://library.usask.ca/copyright/students/rights.php, or contact the University's Copyright Coordinator at mailto:copyright.coordinator@usask.ca or 306-966-8817.

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

Academic Integrity

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.

Students are urged to read the Regulations on Academic Misconduct and to avoid any behaviours that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence.

For help developing the skills for meeting academic integrity expectations, see: https://academic-integrity.usask.ca/students.php

Students are encouraged to ask their instructors for clarification on academic integrity requirements.

All students are encouraged to be aware of the rules for courses set out in the Academic Courses Policy on Class Delivery, Examinations, and Assessment of Student Learning.

Prepare for Integrity

Students are expected to act with academic integrity.

- Students 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 (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 with Access and Equity Services (AES)

Access and Equity Services (AES) is available to provide support to students who require accommodations due to disability, family status, and religious observances.

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.

Students who require accommodations for pregnancy or substantial parental/family duties should contact AES to discuss their situations and potentially register with that office.

Students who require accommodations due to religious practices that prohibit the writing of exams on religious holidays should contact AES to self-declare and determine which accommodations are appropriate. In general, students who are unable to write an exam due to a religious conflict do not register with AES but instead submit an exam conflict form through their PAWS account to arrange accommodations.

Any student registered with AES, as well as those who require accommodations on religious grounds, may request alternative arrangements for mid-term and final examinations by submitting a request to AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.

For more information or advice, visit https://students.usask.ca/health/centres/access-equity-services.php, or contact AES at 306-966-7273 (Voice/TTY 1-306-966-7276) or email aes@usask.ca.

Student Supports

Academic Help for Students

Visit the University Library and Learning Hub to find supports for undergraduate and graduate students with first-year experience, study skills, learning strategies, research, writing, math and statistics. Students can attend workshops, access online resources and research guides, book 1-1 appointments or hire a subject tutor through the USask Tutoring Network

Connect with library staff through the AskUs chat service or visit various library locations on campus.

Enrolled in an online course? Explore the Online Learning Readiness Tutorial.

Teaching, Learning and Student Experience

Teaching, Learning and Student Experience (TLSE) provides developmental and support services and programs to students and the university community. For more information, see the students' web site http://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 (https://students.usask.ca/student-central.php).

Gordon Oakes Red Bear Student Centre

The Gordon Oakes Red Bear Student Centre) is dedicated to supporting Indigenous 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 an intercultural gathering space that brings Indigenous and non-Indigenous students together to learn from, with and about one another in a respectful, inclusive, and safe environment. Visit https://students.usask.ca/indigenous/index.php or students are encouraged to visit the ASC's website https://students.usask.ca/indigenous/gorbsc.php

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. Visit https://students.usask.ca/international/issac.php for more information.