



## COURSE SYLLABUS

<b>COURSE TITLE:</b>	BIOL 331 Plant Physiology	<b>TERM:</b>	Fall 2021
<b>COURSE CODE:</b>	82699	<b>DELIVERY:</b>	Lecture & Practicum (Lab)
<b>COURSE CREDITS:</b>	3.0	<b>START DATE:</b>	September 3 <sup>rd</sup> , 2021
<b>CLASS SECTION:</b>	01	<b>LAB LOCATION:</b>	G74B Thorvaldson Building
<b>CLASS LOCATION:</b>	Geology 165	<b>LAB TIME:</b>	Thursdays 1:30PM to 5:20PM Fridays 1:30PM to 5:20PM
<b>CLASS TIME:</b>	MWF 8:30 AM to 9:20 AM		
<b>WEBSITE:</b>	Via Course tool (Canvas)		

### 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 #220.9 Collaborative Sciences (306) 966-4439  
**Instructor** Research Building byungkook-brian.ham@usask.ca

Jacey Bell #91 Murray Building (306) 966-4493  
**Lab Coordinator** 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 and Teaching Context

We appreciate all students to register the BIOL331 (in-person) in 2021-2022 Term 1. The past 18 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.

## 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. Improve the ability to read and interpret current scientific literature with criticism.

Apply plant physiological processes to explain solutions that plants face many environmental challenges.

Information on literal descriptors for grading at the University of Saskatchewan can be found at: <http://students.usask.ca/academics/grading/grading-system.php>

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

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>

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 3, 2021**. And this class includes **a weekly lab session, starting on September 9<sup>th</sup>, 2021**. 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, 3-24

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

### **Mineral Nutrition and Nutrient Assimilation**

Sep, 27-Oct, 6

Ionic requirements;  
Biochemical reactions for nutrient assimilation;

### **Solute Transport**

Oct, 8-25

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

### **Photosynthesis**

Oct, 27 - Nov, 24

Carbon metabolism – C<sub>3</sub> and C<sub>4</sub>;

Control of carbon allocation;

**Respiration**

Nov, 26 - Nov, 29

Glycolysis;

Function of mitochondria;

**Plant Hormone (Time permitting)**

Dec, 1– Dec, 3

**Final Exam Review**

Dec, 6

**Final Exam**

**Midterm and Final Examination Scheduling**

**Midterm Exam Review**

Oct, 13

**Midterm Exam**

Oct, 15

Final examinations may be scheduled at any time during the examination period (**Dec, 6 – 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 answer, essay, multiple choice and multiple answers.

**Required Resources**

**Readings/Textbooks**

*Plant Physiology and Development, 6th edition by Taiz, Zeiger, Møller and Murphy. Sinauer Publishing*

Textbooks are available from the University of Saskatchewan Bookstore:

<http://www.usask.ca/bookstore/>

**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	45
Lab reports	25
Total	100%

## Evaluation Components

### Midterm Exam:

**Value:** 30% of final grade

**Date:** At the lecture time of October 15, 2021.

**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.

### Final Exam

**Value:** 45% 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.

### Laboratory Reports

**Value:** 25% 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 **all course elements (midterm exam, final exam, laboratory reports and group presentation)** in order to pass this course.

## 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, or 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. And students will be prohibited from recording the course.

## 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.php> where 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

### **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 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)

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. 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](mailto: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.

For information on AES services for Fall 2021 please visit:

<https://students.usask.ca/health/centres/access-equity-services.php#Fall2021Information>

## Student Supports

### Academic Help for Students

The University Library offers a range of learning and academic support to assist USask undergrad and graduate students. For information on specific services, please see the Learning page on the Library web site <https://library.usask.ca/support/learning.php>.

Remote learning support information <https://students.usask.ca/remote-learning/index.php>  
Class and study tips <https://students.usask.ca/remote-learning/class-and-study-tips.php>



Remote learning tutorial [https://libguides.usask.ca/remote\\_learning](https://libguides.usask.ca/remote_learning)  
Study skills materials for online learning <https://libguides.usask.ca/studyskills>  
A guide on netiquette, principles to guide respectful online learning interactions  
<https://teaching.usask.ca/remote-teaching/netiquette.php>

## **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>.

## **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>).

## **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](http://students.usask.ca) for more information.