

## COURSE SYLLABUS

### **BIOL 331.3 (01) (82699): Plant Physiology**

MWF 8:30 AM to 9:20 AM, BIOL 124 (Remote teaching via WebEx)

**Lab Sections: Remote lab courses via asynchronous Canvas Modules**

**Synchronous lab discussions**

Thursdays 2:30PM to 4:30PM

Fridays 2:30PM to 4:30PM

**Lab Sections: (Remote lab courses via WebEx)**

Thursdays 1:30PM to 5:20PM (G74B Thorvaldson Building)

Fridays 1:30PM to 5:20PM (G74B Thorvaldson Building)

**Prof. Dr. Byung-Kook Ham**

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**Office hours:** By appointment

### **Catalogue Description**

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

**Prerequisites: Biology 222**

### **Remote Learning Context**

The remote teaching and learning context is new to most, and that all participants in the course should interact with empathy and care.

### **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.
5. 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>

[Academic Courses Policy on Class Delivery, Examinations, and Assessment of Student Learning: Arts and Science Edition.](#)

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: [http://www.usask.ca/university\\_secretary/LearningCharter.pdf](http://www.usask.ca/university_secretary/LearningCharter.pdf)

## Course Overview

This course comprises 50 minutes lecture, three times per week, **beginning on September 4, 2020**. And this class includes **a weekly lab session, starting on September 10<sup>th</sup>, 2020**. 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, 4-25

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, 28-Oct, 7

Ionic requirements;  
Biochemical reactions for nutrient assimilation;

### Solute Transport

Oct, 9-26

Principles of solute transport in plants;

Transport in roots;  
Phloem transport;

**Photosynthesis**

Oct, 28 - Nov, 25

Carbon metabolism – C<sub>3</sub> and C<sub>4</sub>;  
Control of carbon allocation;

**Respiration**

Nov, 27 - Nov, 30

Glycolysis;  
Function of mitochondria;

**Plant Hormone**

Dec, 2 – Dec, 4

**Final Exam Review**

Dec, 7

**Final Exam**

**Midterm and Final Examination Scheduling**

**Midterm Exam Review**

Oct, 19

**Midterm Exam**

Oct, 21

Final examinations may be scheduled at any time during the examination period (Dec, 8 – 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**

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

**Required Resources**

**Textbook:**

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

Textbooks are available from the University of Saskatchewan Bookstore:

<https://bookstore.usask.ca/students.php#MyTextbooks>

**Downloads**

Lecture materials will be available via the course tool (Canvas). Normally, the instructor will post lecture notes after a lecture, however, depending on the course progress, students may download some lecture notes before a class.

### 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:** October 19<sup>th</sup> 2020

**Length:** 50 mins

**Type:** Open-book exam with a limited time. Combination of multiple choice and answering written questions.

**Description:** Based on all lecture topics before the mid-term exam.

#### Final Exam

**Value:** 45% of final grade

**Date:** Consult Final Exam Schedule

**Length:** 3 hours

**Type:** Open-book exam with a limited time. Combination of multiple choice 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.

#### 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 for Laboratory Classes

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”.

## 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>.

## Recording of the Course

### Use of video and recording of the course:

The lectures will be delivered in-live through the WebEx. Video conference sessions in this course may be recorded and made available only to students in the course for viewing via Canvas after each session.

Please remember that course recordings belong to your instructor, the University, and/or others (like a guest lecturer) depending on the circumstance of each session, and are protected by copyright. Do not download, copy, or share recordings without the explicit permission of the instructor.

For questions about recording and use of sessions in which you have participated, including any concerns related to your privacy, please contact your instructor. More information on class recordings can be found in the Academic Courses Policy <https://policies.usask.ca/policies/academic-affairs/academic-courses.php#5ClassRecordings>.

### Required video use:

At times in this course you will be required to have your video on during video conferencing sessions. It will be necessary for you to have use of a webcam built into or connected to your computer. For questions about use of video in your sessions, including those related to your privacy, contact your instructor.

## 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, unless materials are designated as open education resources. 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.

## Integrity in a Remote Learning Context

Although the face of teaching and learning has changed due to covid-19, the rules and principles governing academic integrity remain the same. If you ever have questions about what may or may not be permitted, ask your instructor. Students have found it especially important to clarify rules related to exams administered remotely and to follow these carefully and completely.

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://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php>) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php#IXXIAPPEALS>)

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#AboutAcademicIntegrity>

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://library.usask.ca/academic-integrity.php#AcademicIntegrityTutorial>

## Access and Equity Services (AES) for Students

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 and remote learning please visit <https://updates.usask.ca/info/current/accessibility.php#AccessandEquityServices>

## 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/study/remote-learning.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>.

### 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>).

### 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](https://students.usask.ca) or [updates.usask.ca](https://updates.usask.ca) for more information.

### **Treaty Acknowledgement**

As we engage in Remote Teaching and Learning, I 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. I would also like to recognize that some may be attending this course from other traditional Indigenous lands. I 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.



# ACCESS AND EQUITY SERVICES

## MEDICAL DOCUMENTATION

If you are submitting your completed [AES Medical Questionnaire](#) or a [Psychoeducational Assessment](#) to our office, email is best: [aes@usask.ca](mailto:aes@usask.ca). If you do not have access to a scanner, many smartphones offer that capability either through free apps such as Microsoft Office Lens ([Google Play Store](#) / [Apple App Store](#)) or the built-in [iOS Notes App](#).

## DROP-INS

All scheduled drop-in times are cancelled until further notice. If you would like to book an appointment to speak to an advisor, please call [306-966-7273](tel:306-966-7273) or email [aes@usask.ca](mailto:aes@usask.ca). Please continue to check our [main AES website](#) for updates.

## REGISTRATION AND OTHER APPOINTMENTS

You can still register with AES, though registration appointments will be over the phone or via WebEx. If you have already scheduled an in-person appointment with an AES advisor, this appointment will now be done either over the phone or via WebEx. Someone from AES will reach out to you directly to alert you of this change if they have not already done so. Please do not come to the AES office for your appointment.

## EXAMS

We understand that you have a lot of questions about how your exams will be handled in light of the COVID-19 protocols as we have many of the same questions. The situation is changing very rapidly and we are waiting for more information from the University. We will keep you updated as we learn more. For most recent updates, please visit [the AES Blog](#).

## NOTETAKING

AES students and notetakers are being kept up to date with information via email and PAWS. Please check your email and PAWS announcements, and contact [aesnotetaking@usask.ca](mailto:aesnotetaking@usask.ca) with any questions.

**FOR THE MOST RECENT UPDATES FROM THE UNIVERSITY,  
PLEASE VISIT [UPDATES.USASK.CA](https://updates.usask.ca)**