# BIOL 6100-029

Adv. Topics in Biology: Plant physiological theory and techniques
Fall 2021

# 1 Course Description

Students in this course will learn mechanistic theory and techniques commonly used in the field of plant physiology. The course will focus on data acquisition at scales from the organ to the whole-plant. Theory will be taught through reading of primary literature, which will be combined with the teaching of techniques in the lab and field.

## 1.1 Class Time and Location

Wednesdays 9:00-9:50 or otherwise agreed upon

Experimental Sciences Building II (ESB II) Room 409 or or otherwise agreed upon.

## 1.2 Instructor

Dr. Nick Smith

ESB II Room 402D

806-834-7363

nick.smith@ttu.edu

*Meetings by appointment*

### 1.3 Recommended Texts

Plant Physiological Ecology (2nd Edition; 2008) by Lambers, Chapin, and Pons

The book can be accessed from Springer here: `https://www.springer.com/us/book/9780387783406`. Click on "Access this title on SpringerLink." It can also be accessed through the TTU library.

Plant Physiology and Development (6th Edition) by Taiz, Ziegler, Moller, and Murphy

## 2 Mode of Instruction

All instruction will be done face-to-face unless the university directs classes be taught online (see next section).

## 3 Contingency Statement

If Texas Tech University campus operations are required to change because of health concerns related to the COVID-19 pandemic, it is possible that this course will move to a fully online delivery format. Should that be necessary, students will need to have access to a webcam and microphone for remote delivery of the class. Additionally, students will need to have access to Zoom software.

## 4 Course Materials

All course materials, including lecture slides, readings, activities, and code will be posted to a GitHub repository for the course. The primary repository address is `https://github.com/SmithEcophysLab/ecophys_theory_fall2021`.

# 5 Learning Objective

This course will broadly focus on understanding the theory behind techniques used in plant physiology, with a focus on those use in plant physiological ecology. The course will also use hands-on lessons to teach students how to perform those techniques. Class activities will be based on discussion and dissemination of ideas, including classic and recent scientific literature. Topics will be flexible and modified to match student interests where possible.

# 6 Attendance Policy

Attendance is strongly recommended. The course assessments will be done during class (see below).

# 7 Course Assessment

## 7.1 *Participation and Engagement*

Being an active and engaged participant in the class will benefit your understanding of material as well as your peers'. Examples include asking questions, providing feedback, and facilitating discussion. Participation and engagement of each student will be monitored during each class period and will constitute the only assessment.

# 8 Grading

Participation and Engagement: 100%

# 9 Grading Scale

A: $\geq$ 90%

B: 80 – 90%

C: 70 – 80%

D: 60 – 70%

F: $\leq$ 59.9%

# 10 Missing In-class Activities

Students will be required to be in class to receive participation and engagement points. Please contact Dr. Smith if you plan to miss class for a university function *prior to class*. If class is missed due to an illness, please let Dr. Smith know as soon as possible (see COVID illness based absence policy below).

## 10.1 Illness Based Absence Policy

If at any time during this semester you feel ill, in the interest of your own health and safety as well as the health and safety of your instructors and classmates, you are encouraged not to attend face-to-face class meetings or events. Please review the steps outlined below that you should follow to ensure your absence for illness will be excused. These steps also apply to not participating in synchronous online class meetings if you feel too ill to do so and missing specified assignment due dates in asynchronous online classes because of illness. If you are ill and think the symptoms might be COVID-19-related:

- Call Student Health Services at 806.743.2848 or your health care provider. After hours and on weekends contact TTU COVID-19 Helpline at [TBA].
- Self-report as soon as possible using the Dean of Students COVID-19 webpage. This website has specific directions about how to upload documentation from a medical provider and what will happen if your illness renders you unable to participate in classes for more than one week.
- If your illness is determined to be COVID-19-related, all remaining documentation and communication will be handled through the Office of the Dean of Students, including notification of your instructors of the period of time you may be absent from and may return to classes.
- If your illness is determined not to be COVID-19-related, please follow steps below.

If you are ill and can attribute your symptoms to something other than COVID-19:

- If your illness renders you unable to attend face-to-face classes, participate in synchronous online classes, or miss specified assignment due dates in asynchronous online classes, you are encouraged to visit with either Student Health Services at 806.743.2848 or your health care provider. Note that Student Health Services and your own and other health care providers may arrange virtual visits.
- During the health provider visit, request a "return to school" note;
- E-mail the instructor a picture of that note;
- Return to class by the next class period after the date indicated on your note.

# 11 TTU COVID-19 Policy Reminders

The Texas Tech University System has implemented a mandatory Facial Covering Policy to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests that there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Because of the potential for transmission of the virus, and to be consistent with the University's requirement, students in this class are to wear a mask/facial covering before, during, and after class. Observing safe distancing practices within the classroom by spacing out and wearing a mask/facial covering will greatly improve our odds of having a safe and healthy in-person class experience. Any student choosing not to wear a mask/facial covering during class will be directed to leave the class and will be responsible to make up any missed class content or work.

COVID-19-related links:

- Student Affair COVID-19 (`https://www.depts.ttu.edu/studentaffairs/SACOVID19.php`)
- Student COVID-19 Protocol (`https://www.depts.ttu.edu/communications/emergency/coronavirus/provostdocs/Student_COVID-19_Flowchart_07-21-20.pdf`)
- TTU Commitment (`https://www.ttu.edu/commitment/`)

# 12 Special Considerations

## 12.1 Disabling Condition

Any student who, because of a disability, may require special arrangements in order to Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact Dr. Smith as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.

## 12.2 Religious Holy Days

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

# 13 Academic Integrity

As stated in the Texas Tech University catalog, “The attempt of any students to present as their own work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenses liable to serious consequences, possibly suspension.” This statement applies to cheating in whatever manner, including plagiarism.

# 14 TTU Resources for Discrimination, Harassment, and Sexual Violence

Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the Office for Student Rights and Resolution, (806)-742-SAFE (7233) or file a report online at `titleix.ttu.edu/students`.

Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are:

- TTU Student Counseling Center, 806-742-3674, `https://www.depts.ttu.edu/scc`. Provides confidential support on campus.
- TTU 24-hour Crisis Helpline, 806-742-5555. Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.
- Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, `https://voiceofhopelubbock.org`. 24-hour hotline that provides support for survivors of sexual violence.
- The Risk, Intervention, Safety and Education (RISE) Office, 806-742-2110, `https://www.depts.ttu.edu/rise/`. Provides a range of resources and support options focused on prevention education and student wellness.
- Texas Tech Police Department, 806-742-3931, `http://www.depts.ttu.edu/ttpd/`. To report criminal activity that occurs on or near Texas Tech campus.

# 15 LGBTQIA

I, Dr. Smith, identify as an ally to the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community, and I am available to listen and support you in an affirming manner. I can assist in connecting you with resources on campus to address problems you may face pertaining to sexual orientation and/or gender identity that could interfere with your success at Texas Tech. Please note that additional resources are available through the Office of

LGBTQIA within the Center for Campus Life, Student Union Building Room 201, www.lgbtqia.ttu.edu, 806.742.5433.

# 16 Online Classroom Civility

Texas Tech University is a community of faculty, students, and staff sharing an expectation of cooperation, professionalism, respect and civility in all forms of university communication and business. This expectation applies to all interactions in a classroom setting where an exchange of ideas and creative thinking should be encouraged and where intellectual growth and development are fostered. As we consider ways in which we maintain a productive and cooperative online environment, many of the same standards from a face-to-face instruction transfer to the online setting. In this way, at the instructor's discretion, disruptive behavior may result in disciplinary referrals pursuant to the Texas Tech University Code of Student Conduct. Students are expected to maintain online behaviors that are conducive to learning.

Examples of behavior that may be considered disruptive include:

- Disrupting the flow of a class session(s) by making off-topic comments.
- Enabling or participating in online classroom hijacking ("Zoombombing") by participating in online classroom streams without being enrolled in the course or by sharing streaming classroom links with parties not enrolled in the course.
- Spamming, hacking, or using TTU or Blackboard platforms for commercial purposes.
- Cyberbullying or online harassment.
- Habitually interfering with or stopping instructional delivery

## Schedule of Topics by Week

25/08/21 – Introductions, semester planning, and goals

01/09/21 – Why plant physiology?

08/09/21 – Photosynthesis I: basics

15/09/21 – Photosynthesis I lab

22/09/21 – Photosynthesis II: response curves

29/09/21 – Photosynthesis II lab

06/10/21 – Respiration

13/10/21 – Respiration lab

20/10/21 – Water potential

27/10/21 – Water potential lab

03/11/21 – NO CLASS

10/11/21 – Tissue chemistry

17/11/21 – Tissue chemistry lab

24/11/21 – NO CLASS

01/12/21 – Semester wrap-up