

**SUL ROSS STATE UNIVERSITY - BIO 4405/5407 - PLANT PHYSIOLOGY - SPRING SEMESTER 2019**

**Prof:** Jim Zech  
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**Office Hours:** By appointment or W: 9:30 – 11:00 A.M., 1:00 – 2:00 P.M.; TTH: 9:30 - 11:00 A.M.

**Time and Place:** Lecture: T/TH: 8:00 - 9:15 A.M.; 101 WSB (SRSU); ?? (MC)  
 Lab: T: 3:00 - 4:50 P.M., 206 WSB (SRSU); See Ms. Schenkman (MC)

**Text:** *Plant Physiology*; Frank B. Salisbury and Cleon W. Ross, 4th Edition OR *Plant Physiology*, Taiz and Zeiger; Various Papers; *Plant Physiology: A Laboratory Manual for Biology 4405*, J. C. Zech

**Tentative Class Schedule and Reading Assignments:**

WK	DATE	LECTURE TOPICS	CHAPTERS (S&R)	LAB
1	1/22	Introduction	Rv Apx A; p. 173-176	
	1/24	Introduction/Definitions		No Lab (1/22)
2	1/29	Define Plant Physiology	(Rv 1)	Introduction (1/29)
	1/31	Fundamentals of Chemistry	(Rv 1)	Planting: Peas (2/5)
3	2/5	Fundamentals of Chemistry	Rv Apx A; p. 173-176	Planting: Soybeans (2/12)
	2/7	Plant Cells	1	Water (2/19)
4	2/12	Water: Properties	2	Pigments (2/26)
	2/14	Water: Diffusion	2	Photosynthesis - Convince Me (3/5)
5	2/19	Water: Osmosis	3	Photosynthesis - Convince Me (3/12)
	2/21	Water: Water Potential	3	Spring Break (3/19) - No Lab!
6	2/26	Water: Plant Cell	3	Tropisms (3/26)
	2/28	<b>EXAM 1: Water</b>	-	Tropisms (4/2)
7	3/5	Transpiration	4	Tropisms (4/9)
	3/7	Stomates	4	Soybean Harvest (4/16)
8	3/12	Cohesion Tension	5	Hormones (4/23)
	3/14	<b>EXAM 2: Transpiration/Cohesion Tension</b>	-	Hormones (4/30)
9	3/19	<b>SPRINGBREAK</b>		<b>Lab Exam/Papers Due (5/7)</b>
	3/21	<b>SPRINGBREAK</b>		
10	3/26	Photosynthesis	10,11,12	
	3/28	Light Reactions	10	
11	4/2	Light Reactions	10	
	4/4	Light Reactions	10	
12	4/9	<b>EXAM 3: Light Reactions</b>	-	
	4/11	Calvin Cycle	11	
<b>W</b>	4/12	<b>LAST DAY TO DROP ANY COURSE WITH A W</b>		
13	4/16	Calvin Cycle, C-4	11	
	4/18	C-4, CAM	11	
14	4/23	CAM	11	
	4/25	<b>EXAM 4: Dark Reactions</b>	-	
15	4/30	Translocation	8	
	5/2	Translocation	8	
16	5/7	Hormones	17,18	
	5/9	<b>DEAD DAY – NO CLASS</b>		
17	5/15 (Wednesday)	<b>FINAL EXAM (8:00 A.M. - 10:00 A.M.; Final Topics and Selectively Comprehensive)</b>		

**ESTIMATED POINT DISTRIBUTION (TBD = To Be Determined):**

Individual Lecture Topic Exams:	TBD (± 100 points each)
Final Exam	TBD
Lab Exam/Practical:	100
Lab Reports: 2 @ 75	150
plantphys.com:	100 (Grad Credit Only)
Literature Review	100 (Grad Credit Only)
<b>TOTAL POINTS CLASS:</b>	<b>TBD</b>

**GRADING:** Your final grade in Plant Physiology will be determined by the total points you receive divided by the total points possible and the scale listed below. There will be no deviation from this scale.

Grading Scale (percent of total points): A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 59 and lower

## STUDENT LEARNING OUTCOMES:

- SLO1 The student will be able to demonstrate an understanding of basic biological concepts, including but not limited to evolution via natural selection, cell theory, and the role and function of DNA.
- SLO2 The student will be able to demonstrate utilization of various field techniques toward addressing scientific questions in the specific discipline. These field techniques can include, but are not limited to, plant collection and processing, various animal collection techniques, ecological surveying and sampling, and biodiversity indexing.
- SLO3 The student will be able to use biological instrumentation to solve biological problems using standard observational strategies.
- SLO4 The student will develop writing skills by summarizing and critiquing recent relevant biological literature.

## OBJECTIVES OF THIS COURSE (INCLUDING LAB):

- Analyze the characteristics of water, applying them to plant function and structure.
- Explore the route of transpiration, applying the basics of movement.
- Understand the reactions of photosynthesis, including the alternatives of carbon fixation.
- Explore the route of translocation, applying the basics of movement.
- Understand the effect hormones have on plants.
- Understand the nitrogen cycle, and explore the effects of high and low nitrogen soils.
- Understand terminology relevant to biological laboratory and field work.
- Explore the applications of scientific skills and knowledge to daily living.
- Understand the safe and proper use of laboratory and field equipment and supplies.
- Understand the principles of experimental laboratory research and proper reporting techniques.

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**RULES TO LIVE BY:** This lecture has been scheduled for 1 hour 15 min. and the lab for approx. 2 hrs. You should plan to be here for the **ENTIRE** time block. I will start at the hour, plan to be on time. Bring your text to class and read any applying material before coming to class. Keep the classroom clean. No tobacco, eating, drinking, **PHOTOS**, cheating, **CELL PHONES, Feet on Furniture**, sleeping, etc. Always handle laboratory material with care. **READ ALL PAPERS** assigned and be ready to contribute to the discussion. Papers read will be fair game for exam questions. **WHEN WORKING IN THE GREENHOUSE** be responsible for your plants only, do not do something (e.g., watering) that will affect others. **Failure to follow proper greenhouse conduct will result in the termination of your project and the points associated with it.**

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**ABSENCES: MY BEST ADVICE IS DON'T BE.** Regular attendance is expected and required to pass the course. If you must miss class see me **BEFORE** class or inform me **BEFORE** class so other arrangements can be made. I will not give make-up exams unless I am contacted **BEFORE** the absence and/or presented with a written valid medical excuse or documentation of other valid reasons such as sickness or death in the family. Exams must be made up within 1 week of their originally scheduled date. Because of its complicated nature and the time involved in putting it together, the final lab exam/practical must be taken on the date scheduled with no make-up available.

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**LAB REPORTS:** You will be required to write two lab reports based upon separate experiments completed this semester. You will be writing them as if you were submitting them to the *American Journal of Botany* for publication. *American Journal of Botany* format will be provided. Don't wait until the last minute to begin! Consider writing as information and data are made available!

**plantphys.com (GRAD CREDIT ONLY):** Find your favorite Plant Physiology web page and be prepared to give the class a virtual tour! (I'm looking for the WOW factor, video, animation, etc.)

**LITERATURE REVIEW (GRAD CREDIT ONLY):** Review 10 current (within the last year) journal articles which cover some aspect of Plant Physiology. For each article be sure to include: (1) a proper citation; (2) a summary; and (3) your impression.

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**DISTANCE EDUCATION STATEMENT:** Students enrolled in distance education courses have equal access to the university's academic support services, library resources, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should submit online assignments through Blackboard or SRSU email (*e-mail for Plant Phys!*), which require secure login information to verify students' identities and to protect students' information. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU webpage.

**DISABILITIES INFORMATION:** Qualified students with disabilities needing academic or other accommodations to ensure full participation in the programs, services and activities at SRSU should contact Counseling and Accessibility Services, 112 Ferguson Hall, Box C-122, 432-837-8203.