



BIOL 4304 Undergraduate Research in Biology

Biology Program

Department of Life Sciences

Instructor Information

Instructor: J. Rodolfo Valdez Barillas (Call me Dr. Valdez)

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Office: Science & Technology Building room 311L

Ecology Research Lab: Science & Technology Building room 361

Field Ecology Laboratory: Portables behind the CAB building Module 104B

0.5 acre outdoor plant growing space: Behind Portables (South of Module 104B)

Course description:

Research experience in biology is a three credit course that gives our students the opportunity to conduct field or/and laboratory ecology research during each academic semester. Students submit a project proposal, conduct their research and turn in a final project report. The course includes University mandatory training and is tailored to your research project and personal interest needs.

Course Objectives

1. Formulate testable research questions and hypotheses
2. Determine realistic goals and objectives
3. Conduct literature research on best methods to be used for collecting and analyzing data
4. Engage in science based discussion with peers and advisors
5. Design experiments based on available time and resources
6. Stay on task and assess project progress
7. Learn and follow best practices in both field and laboratory
8. Use materials and equipment in a laboratory and field setting
9. Troubleshoot challenges using critical thinking and team work
10. Present research findings orally and publish them following a scientific publication format

Recommended resources

- All laboratory equipment and supplies used in the study will be provided by faculty mentor

- Student should bring their own lab coat
- Personal Protective Equipment (PPE) will be provided by instructor
- Students will need to bring adequate clothing for outdoor activities
 - Slacks, jeans, no leggings
 - Closed shoe appropriate for off road walking or hiking (tennis shoes are OK)
 - Long sleeve shirt are recommended as a second layer
 - Hat, cap, bandana is also recommended
 - Water bottle is mandatory for all outdoor work
 - Sunblock and medicine needs are the students responsibility
- Student will also need to use their personal vehicle for work conducted outside of campus

Course policies

Attendance: you are required to attend regularly lab meeting and fulfill minimum hour requirement per week for work conducted in the laboratory or in the field. During the development of the project proposal, literature review research, and data analysis student may conduct work remotely.

Communication: All communication and inquiries to the instructor should be e-mail to jvaldezb@tamusa.edu. Cellphone communication should include texting as first choice, before calling. Communication board and notebook will be available in the laboratory to notify other students or instructor when a consumable is running low, something needs to be replaced or purchased. Regular bi-weekly meeting are required and weekly communication is expected. E-mail communication is important and replies should not wait longer than 48 hours.

Netiquette: Avoid using inappropriate language with others verbally or in written form. All communications, both written and verbal, may be recorded during every online session.

Lab notebook: Student will be provided with laboratory notebook. Notebook belongs to the laboratory, it may be borrowed and used for work outside the lab or at home, but it is expected to be returned. If shared, laboratory notebook most always stay in the lab.

Mentee and Mentorship plan agreement: Student and Mentor will go over a work plan for the semester and will develop a compact (informal academic contract) of goals and objectives developed by mentee and mentor. These will be assessed bi-weekly and modified as needed based on Mentee and Mentor mutual agreement

Project Proposal: Student will have two weeks to develop a project proposal with the guidance of the faculty mentor. Without the project proposal completed, a student cannot initiate their research project

Lab safety and policy: Student will read and become familiar with laboratory safety and procedures for the laboratory work or fieldwork required during their project.

Training: Student needs to complete all necessary training in order to initiate their project.

Peer Mentorship: Peer mentorship is a pedagogical strategy commonly used between working partners or collaborators. The goal is that one peer provides training and guidance to another student. However, peer mentors do not have supervisory roles over each other nor is one expected to abide to the others expectation, if the faculty mentor has not determined such expectations.

Field and lab work: Students will setup lab and field projects and conduct laboratory analysis from field samples or laboratory experiments. Students are expected to dedicate 4 hours a week on their projects. You will spend more time with faculty mentor in the field or in the lab helping, you setup your research, faculty mentor will gradually let you work on your own as you get a good grasp of your work. Work hours are flexible and can be determined on a weekly basis. We will try to always do field work in pairs so lab and field work hours need to be well coordinated.

Research Presentation: You will have the chance to present at the A&M Student Research Symposium (**Spring 2022**), and other meetings (**summer 2022**)

- Students can showcase their research with oral presentations, poster presentations, or roundtable discussions in a synchronous format for the one-day conference. If students have a research project they would like to present, a 150-word abstract must be submitted by TBA.
- Once accepted, the final poster or presentation must be submitted digitally by TBA.

Research proposal outline:

Introduction:

- Research question(s)
- Objective and Hypothesis
 - Research goal and objectives
 - Personal goal and objectives
- Background and justification

Methods

- Materials needed
- Methods and Procedures
- Experimental design
 - Generate table
- Data Analysis (include statistical analysis)
- Timeline (**the timeline is specific for each project following a chronogram format for a three month period**)
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Results

- Expected Results

Final Report outline:

Summary

Introduction:

- Background and justification
- Objective and Hypothesis

Methods

- Study site description
- Experimental procedures
- Materials and equipment needed by experiment
- Data Analysis

Results

- Describe results and present main findings
- Include Tables or Figures with their corresponding descriptive legend on each figure
- Interpretation of results

Discussion

- Interpretation of results
- Compare results with previous research
- Explain relevance of main findings

Conclusion

- Take home message
- Lessons learned

Grading

- Weekly participation (10pts)
- Mentorship plan (10pts)
- Research proposal (20pts)
- Research notebook/journal (20pts)
- Final project report (20pts)
- Research Presentation (poster, article format, Power Point presentation) (20 %)

A = 90 – 100 points

B = 80 – 89.9 points

C = 70 – 79.9 points

D = 60 – 69.9 points

F = <59.9 points

IMPORTANT POLICIES AND RESOURCES

Academic Accommodations for Persons with Disabilities: The Americans with Disabilities Act Amendments Act (ADAAA) of 2008 and the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights protection for persons with disabilities. Title II of the ADAAA and Section 504 of the Rehabilitation Act require that students with disabilities be guaranteed equal access to the learning environment through the provision of reasonable and appropriate accommodation of their disability. If you have a diagnosed disability that may require an accommodation, please contact Disability Support Services (DSS) for the coordination of services. The phone number for DSS is (210) 784-1335 and email is dss@tamusa.edu.

Academic Learning Center: All currently enrolled students at Texas A&M University-San Antonio can utilize the Academic Learning Center for subject-area tutoring. The Academic Learning Center is an appointment based center where appointments are made through the Navigate platform. Students access Navigate through Jagwire in the Student Services tab. The Center is active on campus outreaching to students to highlight services offered. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu or calling (210)-784-1332. Appointments can also be made through JagWire under the services tab.

Counseling Resources: As a college student, there may be times when personal stressors interfere with your academic performance and/or negatively impact your daily functioning. If you or someone you know is experiencing life stressors, emotional difficulties, or mental health concerns at Texas A&M University – San Antonio, please contact the Student Counseling Center (SCC) located in Modular C, Room 166 (Rear entrance) or call 210-784-1331 between the hours of 8:00AM and 5:00PM. All mental health services provided by the SCC are free, confidential (as the law allows), and are not part of a student's academic or university record. SCC provides brief individual, couples, and group therapy, crisis intervention, consultation, case management, and prevention services. For more information, please visit www.tamusa.edu/studentcounseling

In a crisis situation, please walk-in to the Student Counseling Center (SCC) any time between the hours of 8:00AM and 5:00PM to be seen by a licensed clinician. After hours, please contact UPD at 911 or text "HOME" to 741-741 24/7/365 to connect with a trained crisis counselor. The National Suicide Prevention hotline also offers a 24/7/365 hotline at 1-800-273-8255.

Emergency Preparedness: JagE Alert is Texas A&M University-San Antonio's mass notification. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email and/or phone call with instructions and updates. To register or update your information visit: <https://tamusa.bbcportal.com/>.

More information about Emergency Preparedness and the Emergency Response Guide can be found here: <https://www.tamusa.edu/upd/index.html>.

Financial Aid and Verification of Attendance: According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the

institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended the first week of class. Any student receiving federal financial aid who does not attend the first week of class will have their aid terminated and returned to the DoE. Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Jaguar Writing Center: The Jaguar Writing Center provides writing assistance to graduate and undergraduate students in all three colleges. Writing tutors work with students to develop reading skills, prepare oral presentations, and plan, draft, and revise their written assignments. Students can make individual or group appointments with a writing tutor. The Writing Center is located in the Central Academic Building, Suite 208. Appointments can also be made through JagWire under the services tab.

Meeting Basic Needs: Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Dean of Students (DOS@tamusa.edu) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources they may possess.

Military Affairs: Veterans and active-duty military personnel are welcomed and encouraged to communicate, in advance if possible, and special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the Patriots' Casa in-person room 202, or to contact the Office of Military Affairs with any questions at military@tamusa.edu or (210)784-1397.

Religious Observances: Texas A&M University-San Antonio recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

Respect for Diversity: We understand that our students represent diverse backgrounds and perspectives. When we are equity-minded, we are aware of differences and inequalities and are willing to discuss them so we can act to resolve them. The University is committed to building cultural competencies, or the attitudes, skills, and knowledge that enable individuals and organizations to acknowledge cultural differences and incorporate these differences in working with people from diverse cultures. Respecting and accepting people different than you is vital to your success in the class, on campus, and as a future professional in the global community. While working together to build this community we ask all members to:

- Share their unique experiences, values, and beliefs.
- Be open to the views of others.
- Honor the uniqueness of their colleagues.
- Value each other's opinions and communicate respectfully.
- Keep confidential discussions that the community has of a personal (or professional) nature.

- Use this opportunity together to discuss ways in which we can create an inclusive environment in this course and across the A&M-San Antonio community.

The Six-Drop Rule: Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

Statement of Harassment and Discrimination: Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equality of opportunity and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality, diversity, pluralism and the uniqueness of the individual within our state, nation, and world. All decisions and actions involving students and employees should be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, gender identity, or gender expression. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the appropriate offices within their respective units.

Texas A&M University-San Antonio faculty are committed to helping create a safe learning environment for all students and for the university as a whole. If you have experienced any form of sex- or gender-based discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking, know that help and support are available. A&M-San Antonio has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the university. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and other healthcare providers are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the university's Title IX Coordinator. If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact the Student Counseling Center at (210) 784-1331, Modular C.

Students' Rights and Responsibilities:

The purpose of the following statement is to enumerate the essential provisions for the student freedom and responsibility to learn at Texas A&M University-San Antonio. All students are required to follow all policies and regulations as set forth by The Texas A&M University System. This includes the [A&M-San Antonio Student Code of Conduct](#).

Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no university rule or procedure that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the university, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, sexual orientation, genetic information or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university student rules shall be assured a fundamentally fair process.

Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty and the administration.
2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, University Catalog and students must comply with them and the laws of the land.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire university community.
4. A student has the responsibility to recognize the University's obligation to provide an environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notification.
6. We expect that students will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or

Laboratory Attendance Policy

Laboratory courses are unique to your education in that they will provide you with hands-on opportunities to gain the skills and critical thinking processes inherent to the study of biology. For these reasons, we have a strict departmental attendance policy:

1. Attendance is mandatory (see laboratory syllabus for specifics)
2. If you miss more than 3 labs for whatever reason (excused or not) the maximum score you can earn for the laboratory section of a course is 50%.
3. If you miss a lab section for a university excused absence, you may attempt to make up the lab in another lab section if the following criteria are met and directions followed:

a) the absence is considered a university excused absence and was determined to be one by your primary instructor b) you must contact via e-mail both your instructor and the instructor of the section you would like to attend c) you must receive written confirmation that you are able to make up the lab. If you do not receive written confirmation, you will not be allowed to make up the lab.

COVID-19 SYLLABUS ADDENDUM

COVID-19 is a dangerous illness. Above everything else, your health and safety are our concern. The best estimate now is that 20–40% of people infected with the virus have no symptoms. In compliance with safety practices, students are required to complete the COVID-19 student training course. Upon completion, you will receive a certificate with your name and date of completion. If you have yet to complete the course, please do so immediately, as completion is required to return to campus and participate in the Spring 2021 academic semester.

NOTE: If you do not complete this training, you will have a Dean of Students hold on your records, which will prevent adds, drops, and registration.

Students are required to conduct a self-assessment each day before coming to campus to determine if they are exhibiting any signs or symptoms of COVID-19 or have been exposed to COVID-19. Your presence on campus means that you certify that you are not exhibiting any signs or symptoms.

CHECKLIST: If any of the following apply to you, stay home!

1. Have a diagnosis or suspected case of coronavirus;
 2. Are currently exhibiting any of the symptoms associated with COVID-19 as listed on the CDC “Symptoms of Coronavirus” web page <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>—**even one symptom** (e.g., cough or headache);
 3. In the past 14 days have had close (less than six feet) contact with a person who has a lab-confirmed case of COVID-19;
 4. In the past 14 days have had close (less than six feet) contact with a person who is awaiting results of a COVID-19 test because of symptoms or exposure;
 5. In the past 14 days have returned from travel or have traveled through an area with state or local travel restrictions that mandate quarantine upon arrival home.
- Fever or chills (feeling feverish or a measured temperature greater than or equal to 100.0 degrees Fahrenheit)
 - Cough
 - Shortness of breath or difficulty breathing
 - Fatigue
 - Muscle or body aches
 - Headache
 - Loss of taste or smell
 - Sore throat
 - Congestion or runny nose
 - Nausea or vomiting
 - Diarrhea

When in doubt, stay home!

If any of the above apply to you, do NOT come to campus. Instead, contact your professor and the Dean of Students Office dos@tamusa.edu, office phone: (210) 784-1354.

All components of this class, including assessments, can be completed virtually, through Blackboard or other platform used in this class. Office hours will be held via Webex or other platform provided by the instructor.

For lecture classes that include a face-to-face component:

Accommodation for missing class if you meet one of the criteria on the checklist or do not feel comfortable physically attending will be made without penalty. Visitors are not

allowed, and students can attend class only on their designated day for in-person attendance. All students have a responsibility to ensure they are always contributing to a safe learning environment by following all health and safety protocols.

For laboratory classes that include a face-to-face, hands-on component:

Unlike lecture classes with face-to-face components, laboratories are designed to provide hands-on experience and training in particular skills that are difficult to attain online. Thus, if students are registered for a laboratory course with a face-to-face component, it is expected that they physically attend on their scheduled day. However, if students have a documented health issue, are in another high-risk category, or feel uncomfortable attending in person, they may be able to enroll in a section of the course that is designated OLC (on-line class). If no such section exists, which may occur in upper-division courses, it is imperative that students contact their instructors immediately, and accommodations will be handled on a case-by-case basis. Note: You and your instructor may decide that it's in your best interest to finish the course at a later date.

Once enrolled in either a hybrid or a fully on-line section, students may not switch between in-person and on-line learning without instructor approval due to the unique nature of preparing for hands-on activities in a laboratory environment as well as tight regulations on the number of students physically allowed in the laboratory. Accommodation for missing class if you meet one of the criteria on the checklist or do not feel comfortable attending will be made without penalty.

While in the classroom:

1. Sanitize your hands upon entering.
2. Always maintain at least six feet from others, including your instructor and other students.
3. Front-row seating will not be used.
4. Sit in designated seats.
5. Always wear a cloth face covering or surgical mask fully covering your mouth and nose at all times while in the classroom, even if alone.
6. Observe and conform to any markings on the floor indicating appropriate spacing and don't sit in a location that has been marked as being off limits.
7. You may ask questions by raising your hand during class or by emailing the instructor outside of class. Do not approach your instructor before or after class to ask a question or attempt to hand your instructor any document or item, as this does not facilitate social distancing.

While in the laboratory: Special laboratory safety instructions will be provided on the course-specific syllabus, and appropriate training will be provided.

Students who do not live up to these responsibilities will not be permitted to physically attend class. Failure to comply with these health and safety protocols is a violation of the Student Code of Conduct. A student who is not in compliance with these health and safety protocols will not be allowed to remain in the classroom and will be reported to the student- conduct office, which may result in the student being barred from the classroom for the remainder of the semester and may also lead to expulsion from the university.