Department of Plant Biology
Franklin College of Arts and Sciences
UNIVERSITY OF GEORGIA

Excellence in Teaching Portfolio

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Personal Statement

My name is Derek Denney and I am a 5th year PhD student in Plant Biology. I am writing to be considered for UGA's Excellence in Teaching Award. I am a talented and experienced teacher, and I am actively engaged in enhancing my teaching qualifications to further influence students' growth and development—whether it be in scientific inquiry or other career paths.

As a graduate student, I have taught over 600 students at two institutions. I've taught in online, in-person, and hybrid formats. Regardless of the setting or the course, I've learned that no two classrooms are the same. When I first began teaching at UGA, I quickly learned that to be a successful instructor and facilitator, I had to engage students with the material and help them become focused in ways I had not encountered at my previous institution. This required my continual improvement as an instructor and finding innovative ways to increase student learning outcomes. To that end, I enrolled in courses that would increase my teaching acumen with the desire to complete UGA's Interdisciplinary Graduate Certificate in University Teaching.

Graduate teaching experiences in the Department of Plant Biology are generally limited to lab teaching assignments. Grad students only get opportunities to lecture outside of a lab when a faculty member cannot teach for some reason; therefore, it is a rare occurrence to lead a course as a graduate student. I have been fortunate to lead a course twice. In my situation, I was asked to co-lecture an upper division Plant Taxonomy course on short notice, as a faculty member was retiring for health reasons, leaving my fellow grad student co-instructor and I with few teaching materials. This allowed us to make significant updates to the curriculum. In Spring 2020, I implemented projects and assignments I had developed as part of my certificate in University Teaching coursework. The realization of the project was cut short as the COVID-19 pandemic interrupted our in-person teaching model. Nevertheless, I gained experience outside the normal scope of graduate teaching, and I was energized by the opportunity to contribute to the curriculum.

In Fall 2021, I received an NIH T32 training fellowship, which prevented me from teaching that academic year. However, this fellowship provided multiple mentoring workshops, which further honed my teaching toolkit. Additionally, I frequently met with the graduate students who were teaching Plant Taxonomy in Spring 2021 to brainstorm and share my teaching materials. We used my teaching project to collect data and present results at a national Botany conference. In Spring 2022, I was asked to teach Plant Taxonomy again. During this second iteration, my co-instructor and I implemented a course-based research module that enabled students to collect real data for scientific analysis. This project was exciting and fulfilling to me, my co-instructor, and the students. This portfolio will elaborate on this project, and outline ways in which I have gone beyond the normal graduate student teaching duties by prioritizing my professional development in teaching, providing mentorship to students, and conducting outreach on-campus.

These teaching experiences influenced my desire to be a faculty member. My goals were further solidified when I became a member of the Future Faculty Fellows Program, where I gained skills that I look forward to implementing in future courses. I am enthusiastic about teaching and helping others grow, especially in the exciting realms of science! I appreciate your consideration of my application for the Excellence in Teaching Award.

Teaching Philosophy Statement

I value personal growth and development, constantly seeking out knowledge, and I take great joy in supporting others as they pursue their personal aspirations. I strive to support others with compassion, empathy, and kindness. These core values motivate me, and they are reflected in my approach to teaching. I believe enthusiasm for learning flourishes in environments where students are encouraged to be curious learners, appreciated for their diversity of thoughts and experiences, and welcomed with feelings of safety and belonging. My role as an educator is to create these environments and actively improve my skills as a facilitator and educator.

Advancing my teaching practices – The variety of my teaching experiences – from labs to lectures and in online, in-person, and hybrid formats – has shown me that no two classrooms are the same. Continual learning and application of new teaching tools and skillsets is essential to better accommodate the needs of students. This motivates me to adapt my teaching to new strategies and technologies, and to pursue classes on effective teaching strategies, implementing new curriculum, and focusing on students. I seek corrective feedback from as many avenues as possible, and I endeavor to approach teaching with flexibility. I draw value from disciplines outside my own, and I seek out a variety of voices, from within and from without my field, to gain insights on best practices in teaching. Teaching is not just imparting knowledge but being engaged in a constant learning experience to become a better teacher.

Creating an engaging environment – My role as an instructor is to engage with students to facilitate their own curiosity in learning. I implement a variety of approaches to inspire students' active learning. Employing active learning strategies allows students to synthesize information, to analyze their ideas with others, and to get to know their peers. It is not only information, but also ideas in contact that enhance learning. My goal is to make every classroom interaction one in which students are engaging with one another and with the material. Students become independent seekers of knowledge when they engage in the course material in this manner, creating a more meaningful learning experience.

Appreciating diversity in the classroom – I recognize that each student's identity and background influence the learning process. I seek to foster an environment where students can be authentic while they engage with everyone in the class, including me. To create welcoming environments, I share my background, challenges, and educational path transparently with students. I learn every student's name. I talk with students conversationally before I begin a lecture. I invite students to share their struggles and their successes with me. I assign group work by carefully considering each student and their abilities to create balanced teams that maximize each students' strengths. All these methods help me humanize our learning environment and open the floor to students to share their diverse perspectives.

Teaching beyond the classroom – Learning and teaching extend beyond the classroom. I employ the principles outlined above to mentoring opportunities outside of formal classroom settings. As a mentor, I act as a sounding board for student concerns. I practice active listening, empathy, and asking valuable questions as ways to help mentees learn in "real-world" situations. When I mentor, I strive to create an environment in which mentor and mentee can learn together.

As I have applied these principles in teaching, I have seen an increase in student satisfaction with my teaching, I have learned and used new teaching skills, and I have been a more effective mentor and instructor.

Description of Courses Taught

UNIVERSITY OF GEORGIA

Instructor of Record

PBIO 4650/6650 – Plant Taxonomy Spring 2020, 2022
Enrollment: 27-30 students, including undergraduate and graduate students
Description: This course was originally in person but was interrupted by the COVID-19 pandemic and became an online course in 2020. In 2022, we offered a hybrid format with lectures available online and in-person. The course taught principles of taxonomy, systematics, land plant evolution, and field botany. It included plant identification and plant collections. The course consisted of a lecture and lab portion.
Responsibilities: As co-instructor, I designed and implemented a new curriculum with another grad student. We designed all the materials for the lectures and labs, as well as the exams and projects. This included writing the syllabus, planning the lecture and lab schedules, and purchasing required materials for the course. We graded all assignments and provided final grades. I co-taught the entire course in the spring of 2020 but only co-taught the lectures in spring 2022, as a third graduate student taught the lab portion. We created a research project that introduced students to modern and classical plant taxonomy research as well as generated data for scientific use.

Laboratory Teaching Assistant

BIO 1108L – Organismal Biology Lab Spring 2019
Enrollment: 24 students per lab section; 2 lab sections
Description: This was an entry-level biology course designed for science majors. It was a writing-intensive lab course designed to teach basic scientific writing, experimental design, and a variety of lab techniques.
Responsibilities: As a lab TA, I was responsible for an introduction lecture and assisting the students as they completed their experiments. I graded all their assignments, presentations, and lab reports as well as led field trips to off-campus locations throughout the semester.

PBIO 3650 – Plant Ecology Fall 2019
Enrollment: 65 students
Description: This course was designed for upper-division science majors, primarily in plant biology or a related field. It included a lab component and lecture portions that were taught in a flipped classroom format.
Responsibilities: As TA for the lecture, I primarily answered questions students had about the material related to the lecture portion of the class. I served as a writing coach and read drafts of papers to provide individual feedback for their lab portion of the class. I also helped implement new teaching demonstrations with the instructor to explain plant ecology concepts.

PBIO 2500E – Natural Communities of Georgia Fall 2021
Enrollment: 23 students
Description: This was an online course for students of any background. The course was designed to teach students about the natural communities of Georgia and their ecosystems. Students completed a nature walk term project and weekly online assignments and assessments.
Responsibilities: As the TA for this course, I graded online discussions and engaged with students to dig deeper into the subject matter. I worked with students individually as they completed small-stakes assignments about their chosen location for their final project. I provided feedback on their projects and helped them with plant identification techniques.

WASHINGTON STATE UNIVERSITY

Laboratory Teaching Assistant

Biology 106 – Introductory Biology: Organismal Biology Fall 2014 – Fall 2017
Enrollment: Each section had 25 students; I taught 3 sections each semester over 6 semesters (18 total lab sections)
Description: This course was an introductory course for science majors. It involved weekly labs with quizzes, experiments, and exams as well as a written report on a multi-week experiment.
Responsibilities: I prepared quizzes, lectures, and assignments. I also graded the lab reports and provided feedback on early drafts. During my tenure, I helped develop a new, inquiry-based curriculum with active learning modules that was put in use in 2015. I also developed new portions of the lab manual for the students to use as part of this curriculum update.

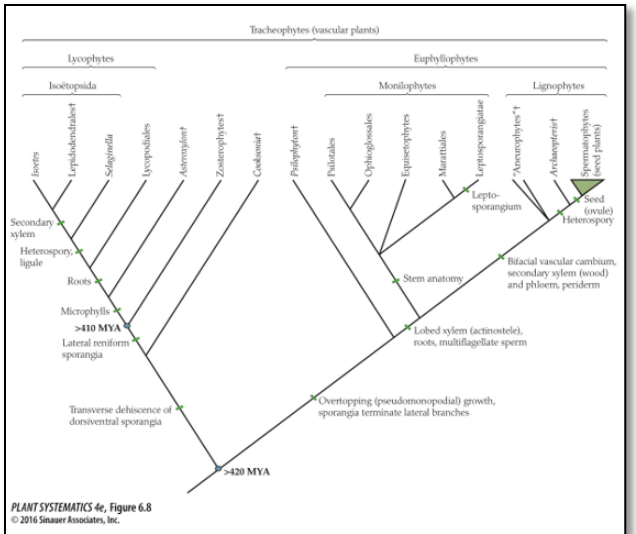
Biology 372 – General Ecology Spring 2018
Enrollment: One lab section of 16 students
Description: This course was intended for upper-division biology students with weekly labs, field trips, semester-length experiments, and a final paper and presentation, as well as a lab notebook that was maintained throughout the semester.
Responsibilities: I taught a lab lecture weekly and helped students as they worked through their experiments. I lead field ecology field trips and taught lab and field techniques. I graded their coursework and provided feedback on their lab notebooks and experimental designs. I was also responsible for setting up and taking down the lab each week with two other TAs. Together, we designed the course materials and a new semester-length experiment.

Sample Teaching Materials

Plant Taxonomy Labs

One of the purposes of the lab portion of PBIO 4650/6650 is to reinforce lecture materials. Traditional approaches instruct students to memorize terminology, species names, or plant descriptions. This approach often lacks a clear connection to the lecture and is daunting. I redesigned the labs to include an inquiry-based approach and center it around images or slides from lectures so students can make direct connections to their notes from class while in the lab. I include thought-provoking questions in the lab handouts to guide students towards the key traits used for plant identification. An example of a lab handout is shown on the right.

Additionally, students are given a knowledge check that reinforces their observations in the lab. These assessments are designed to have students explain key concepts in their own words and ultimately bridge connections between their observations and the lecture material (below left).



Lycophytes

3. *Sellaginella* – This is the sole genus of the family Sellaginellaceae. They have scale-like leaves and two ***spore*** types (meaning one is a megaspore and one is a microspore). Can you identify the two types in the strobilus cross section? Which spore type is female and which is male?

4. *Lycopodium dendroideum*, *L. clavatum*, and *L. ludiculum* (club mosses) are at this station. Note the location of the ***sporangia*** on these specimens, if present. The microscope has a cross section of a strobilus. Are these spores heterosporous or homosporous?

5. *Psilotum nudum*, whisk fern – Note the reduced "leaves" (called enations, with no vascular tissue) and sporangia in clusters. How many (on average) are present in each cluster? This is a diagnostic feature of this species.

Monilophytes

6. *Equisetum hyemale* (scouring rush) is one species of the only living genus of Equisteceae. It is known as a living fossil because many fossils exist in Equisetaceae, but only the genus *Equisetum*

1. What are some similarities and differences between moss life stages that you noticed?

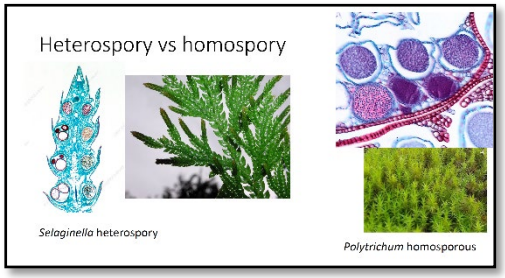
2. *Selaginella* is heterosporous or has two spore types. What spore is the female and which spore type is male? How do you know? How does this compare to other examples of male and female gametes or spores in biology?

3. How many sporangia did the *Psilotum* fern have?

4. What do dimorphic fronds look like? How can you tell them apart?

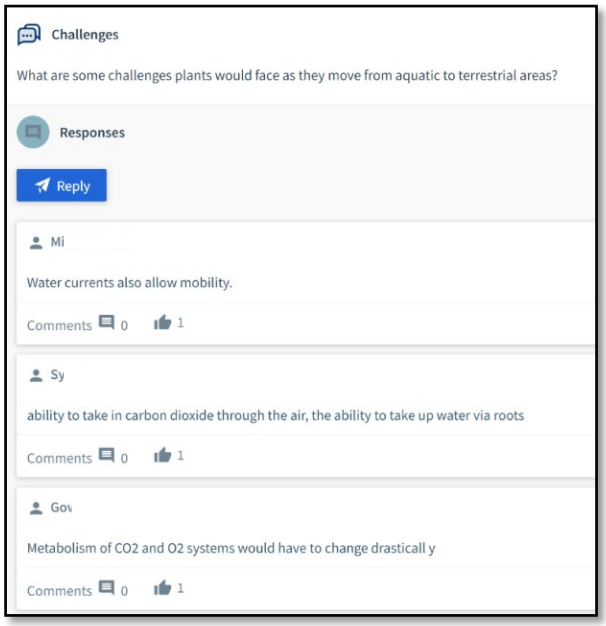
5. What is the difference between the gametophyte and sporophyte stages of a moss vs a fern?

Finally, after a lab is completed, I utilize the same specimens from the lecture classroom to review and reinforce the material we covered in the lab. When possible, I bring in the live specimen as well as create a lecture slide for students to review (below right).



Plant Taxonomy Lectures

One of the greatest challenges with plant taxonomy is the sheer amount of material that could be covered in the course (over 300,000 species of plants!) coupled with unfamiliar terminology and latinized scientific names. It is easy for students to feel overwhelmed and lost as they navigate these foreign concepts and languages.



In my lectures, I incorporate multiple places to stop and assess student understanding of the material. I do this using low-stake knowledge checks and accomplish this with a variety of active learning strategies in small groups or in pairs. Whether online or in-person, technological tools are helpful to direct conversations. For example, I use TopHat to allow students to answer questions anonymously, in groups, or as part of a Think-Pair-Share activity (left). Another tool I enjoy using is Google Jamboard. Jamboards are great ways to incorporate students' ideas and discussions into lectures, and I can include the class's ideas into the handouts for everyone to review. The Jamboard pictured below is an example of student work. To investigate the concept of taxonomy, I provided pictures of objects and tasked students with organizing the images in small groups, resulting in discussion and exploration (right).

Additionally, at the end of every lecture, I have an anonymous online TopHat submission available for students to ask clarifying questions they may think of outside of class. As students study the material outside of class, they can ask questions which I will then be able to address in the following lecture.

Finally, I realize much of the course relies on being able to recognize identifying traits. Memorization of this information can be difficult for students, especially when we discuss plants growing in other regions of the world that they may never experience in person. As much as possible, I make exams conceptual rather than about rote species memorization. Whenever plant identification is used on larger-stake assessments, I allow students to use their notes. I am also conscious of making exams equitable and accessible for everyone by considering a range of abilities.

Innovative Teaching Projects

Coupling iNaturalist with traditional plant collections to teach plant biodiversity
Role: Co-lecturer

Course-based undergraduate research experiences (CURE) are innovative learning experiences that provide students with real opportunities to generate data for outside stakeholders. Using these principles, I developed a course project to give students experience generating plant taxonomy data that can be used outside of the classroom. I implemented the project in class with my co-instructor. The purpose of this experience was to familiarize students with historical and contemporary tools used by botanists and explore the benefits of each research method.

I tasked students with completing a physical plant collection and creating voucher specimens to deposit into an herbarium. Plant species were identified using online tools, dichotomous keys, local flora literature, and herbaria records. Students also recorded data on iNaturalist, an online repository of plant and animal observations, to document plant species. Students exchanged data to provide peer-reviewed feedback on how to improve their digital collections and received feedback from myself and my co-instructor. Additionally, the data was made available publicly so many students received feedback on iNaturalist from experts around the globe.

Each student collected data according to their interests. Some focused on plants in their backyard while others traveled to surrounding states or countries to collect their specimens. As part of the collecting process, students learned about permitting and were required to get proper permissions prior to collecting. To accommodate students who did not have access to technology or sufficient areas to search for plants, we organized optional class-wide collecting field trips.

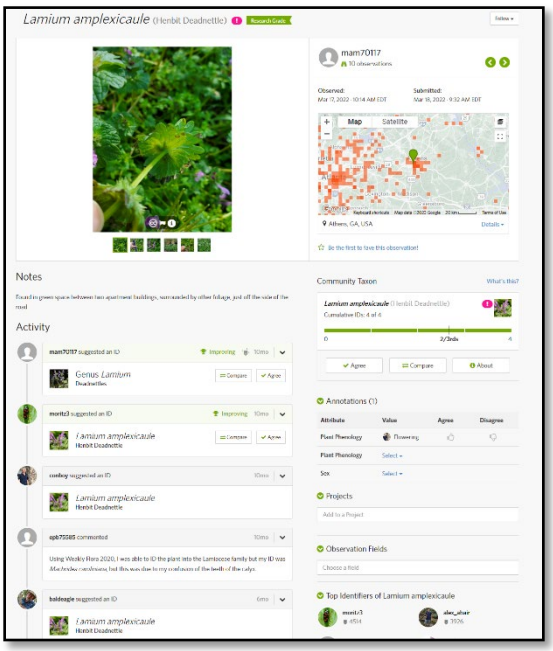
Undergraduates were expected to collect at least 25 plants while graduate students were tasked with at least 50 specimens. As instructors, we helped students collect by using multiple low-stake assignments throughout the semester to ensure sufficient progress. This allowed students to get individualized feedback throughout the project as well as to increase the quality of the data generated by each student.

At the end of the semester, we used a lecture period to discuss the merits of the techniques. Students found a combination of modern and classical approaches increased their understanding of plant diversity and created more robust data for research. By the end of the semester, the students prepared their physical collections for deposit into the UGA herbarium and their research-grade iNaturalist observations had been made available to the broader scientific community. Collectively, the Spring 2022 students added 575 observations of 238 species to iNaturalist and produced over 400 physical specimens for deposit in the herbarium. These data are immediately available for research and have been used by 139 members of the broader scientific community, as evidenced by this iNaturalist statistics image on the right.

Sample Student Work

Digital plant collection

As part of this project, we asked students to identify their peers' plant specimens using dichotomous keys. I provided prompts to help the students consider how to improve the data. They then used these questions to address their peers on iNaturalist. An example of a student's work is below left. Below right is the online platform in which students interacted. This shows interactions from other scientists as well. In this example, a student provided their feedback and other users responded with species verification to get the specimen to the highest quality possible – research grade.



Specimen 2

1. What is the species ID of this specimen?

   Prunus laurocerasus

2. Did your ID match the ID suggested by the observer/identifiers on the project? If not, why do you think that was the case?

   I got Lyonia lucida for my ID and I think that has to on my part. I felt relatively ok doing the first part of the key, but it was much harder to make decisions when two options were concerning the carpels and flowers. I could not see the carpels and the flowers don't appear to have petals (if so, I had a hard time seeing them).

3. What other features would you need or like to see in the images to identify the specimen more easily?

   Maybe a closer up image of the flowers so better see if there are any sepals, petals, or tepals. Also, try to incorporate a picture between the vines of the plant behind the shrub to show that it is not a part of the shrub.

Physical plant collection

Students collected physical specimens over the course of the semester and used a variety of methods to identify the plants. Although not required, some students mounted their specimens on archival paper in preparation for herbaria usage, such as this specimen to the left. All students turned in physical collections with labels documenting the species, its location, and other information about the plant and its environment. Through multiple low-stakes assignments, we provided feedback on the labels and identification of the specimens. In this case, the following feedback was provided to the student.

Feedback to student: This is a beautiful specimen! It is missing some information on the label. What plant family does it belong to? Where was it collected? You should include country, state, county, and other locality data in addition to the GPS coordinates. What other plants did you find growing near this specimen?

Professional Development and Training

Relevant Teaching Awards

Future Faculty Fellows Program 2022
The Future Faculty Fellows Program (3FP), sponsored jointly by the Graduate School and the Center for Teaching and Learning, is a year-long professional development program that brings together 15 innovative and dedicated teaching assistants from across campus to talk about, reflect upon, and improve their teaching, while contributing to their preparation for the academic job market and the rigors of their first faculty positions.

Pedagogical Coursework

GRSC 7770 – Graduate Seminar on Teaching (3 credits) Spring 2019

WIPP 7001 – Pedagogy of Writing in the Disciplines (3 credits) Spring 2019

EDIT 6150E – Introduction to Digital Learning (3 credits) Summer 2019

Outreach and Community Engagement

TA Café, Athens, GA 2022

Georgia Science and Engineering Fair, Senior Division Judge, Athens, GA 2021

Mentor, PlantingScience.org 2015 - Present

Mastering Plant Science Team Liaison, PlantingScience.org 2015-2018

Bilingual (Thai) biology tutor, Pullman, WA & Salt Lake City, UT 2014-2018

Mentorship

Caroline McConnell, *2022 – present*
Ron Saler, *2022 – present*
Nikhil Manocha, *2022- present*
Jane Aloi, *2022 – present*
Leena Patel, *2022*
Edward Gildea, *2022*
Andrew Klutz, *2022*
Saisri Tangirala, *2022; UGA YoungDawg*
Erica Nash, *2021; UGA SUNFIG (REU)*
Pratik Patel, *2021 – 2022*
Ian Volmer, *2021 – 2022*
Manav Kumar, *2022*
Kira Hills, *2021 – 2022*
Zoe Bunch, *2021 – 2022*
Anthony Lee, *2021*
Natalie Hogan, *2019 – 2020*

Relevant Presentations

* indicates undergraduate mentee

1. *Patel, P., **Denney, D**., and J.T. Anderson. Anthocyanin absorption with varying [CO_2] concentration and temperature. *UGA CURO Symposium*, Athens, GA. 2022.
2. *Nash, E., **Denney, D**, and J.T. Anderson. Freezing Tolerance on an Elevational Gradient. Poster. *SUNFIG Genetics Symposium*, Athens, GA. 2021.
3. McNair, M., Zenoble, M., and **D. Denney**. Teaching Taxonomy in "Unprecedented Times." *Botany: Virtual.* 2021.

Evaluation of Teaching

	S 2019 †	F 2019	S 2020 *†	F 2021	S 2022 * †
	BIO 1108L	**PBIO 3650**	**PBIO 4650/6650**	**PBIO 2500E**	**PBIO 4650/6650**
The assignments were useful for learning	3.08	3.72	4.71	4.83	4.67
The course challenged students to think and learn	3.38	4.00	4.64	4.83	4.67
The course was well-organized	2.72	4.00	4.58	4.83	4.67
The student was able to comprehend the material Δ	2.81	4.36	4.61	4.67	4.67
How would you grade this course?	2.99	4.45	4.84	4.83	4.84
The instructor comes prepared to teach each class period	4.31	4.45	4.80	4.30	4.92
The instructor uses class time effectively	3.97	4.27	4.74	4.50	4.75
The instructor communicates fairly and effectively	3.82	4.36	4.77	4.50	5.00
The instructor is enthusiastic about the material α		4.50	4.80	4.50	5.00
The instructor is willing to help students.	4.28	4.60	4.80	4.50	5.00
The instructor stimulates student's interests	3.40	4.32	4.80	4.50	5.00
The instructor's grading policy is fair	2.31	4.41	4.80	4.50	5.00
Encourages students to think for themselves α		4.50	4.80	4.50	5.00
The instructor grades quizzes and assignments fairly α		4.55	4.80	4.33	5.00
How would you grade this instructor?	3.48	4.80	5.00	4.83	5.00

Questions were answered on a 1-5 scale with 5 being the highest and 1 being the lowest.
* Indicates co-lecturer
† Indicates average of all sections
Δ Course evaluations were changed after this semester. Evaluations were based on a 1-5 scale with 3 being 'the course was aimed at my level of comprehension,' 1 being too easy and 5 being too difficult.
α These questions were added beginning in Fall 2019 and were therefore not included in Spring 2019 evaluations

Select Qualitative Feedback

PBIO 4650/6650 – Plant Taxonomy

- Derek did an awesome job teaching plant taxonomy! I really liked the examples he provided, which put the material into context and made everything easier to remember. It felt like we were being taught by someone who is in our shoes and he was very relatable.
- Organized and knowledgeable about course material. Interested and enthusiastic about the materials covered in class.
- This class would not have had the impact it did on me if I did not have Derek and Mark as my instructors! They were amazing!
- Derek always came to class prepared and ready to get started once class time began. He also reminded the class of upcoming assignments and project milestones that were approaching.
- Derek is an effective teacher because he understands how students learn and what an effective workload is.
- Derek was very thorough with his lectures and never had a problem answering anyone's questions in person or online. He was always very aware of the online portion of the class

and tried making everything as easy as possible for everyone. He was also enthusiastic about the material we were learning and always shared cool facts with us. Lastly, Derek and the other TA, Justine made a point to make sure none of us were stressing over our exams, especially the final. It was a really pleasant and fun experience that I hope future classes get to enjoy as well.

- Derek is an excellent teacher. He is knowledgeable and is constantly trying to improve his teaching style. He has been approachable and will always help any student that needs it. You can tell that he has worked hard on this class and I think because of his work ethic the students give him a lot of respect.

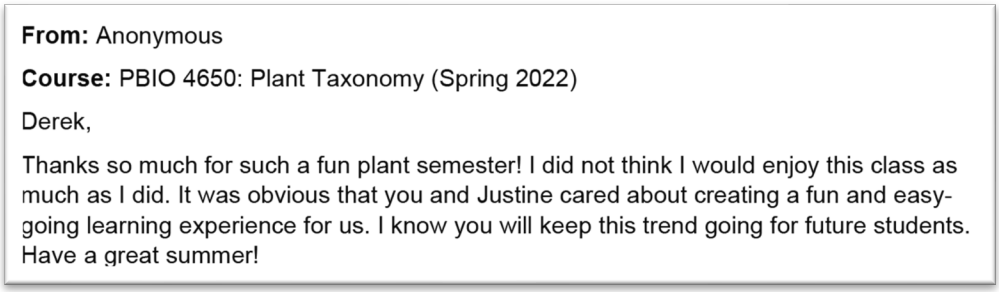
PBIO 3500 – Plant Ecology

- Derek is willing to help students out when they have questions about the in-class assignments.
- Derek was extremely helpful in explaining concepts that were not understood easily during assignments. He was very willing to help, which I appreciated as a student who often felt lost in this class.
- Derek was amazing! He was very very helpful if we had questions to ask him and he seemed very knowledgeable about the content of the class. He has probably been one of the best TAs/grad student that I have encountered at UGA.

BIOL 1108L – Organismal Biology Lab

- Derek was a phenomenal instructor in terms of holding student's interest and describing the work he assigned. Overall, his class was very enjoyable and I would honestly take it again.
- Overall Derek was great, he did a good job at explaining things. I really liked him because of how nice he was whenever I had a question for him.
- I really liked how detailed and thorough your feedbacks to our assignments were. The feedbacks are really helpful and showed stuff that I do wrong that I never considered before.
- Derek was helpful in helping students improve on their assignments.
- He was always prepared for class and was energetic. Even though the class itself was poorly designed, Derek always did a good job of trying his best to make the most out of our time. I appreciated his effort and energy, but overall he was very good.

Note received from the "Thank a Teacher" program at the Center for Teaching and Learning



From: Anonymous

Course: PBIO 4650: Plant Taxonomy (Spring 2022)

Derek,

Thanks so much for such a fun plant semester! I did not think I would enjoy this class as much as I did. It was obvious that you and Justine cared about creating a fun and easy-going learning experience for us. I know you will keep this trend going for future students. Have a great summer!