

# Teaching Philosophy Statement

## Introduction

My teaching philosophy centers on the belief that physics and the natural sciences should be both deeply understood in theory and vividly relevant in the real world. I strive to cultivate in students a robust conceptual foundation in science while simultaneously igniting their curiosity through practical applications. Having taught at the university, secondary school, and research internship levels, I have learned that students engage best when they see how abstract principles connect to their lives and future challenges. My goal is to create an interactive, interdisciplinary learning environment where students become independent thinkers. In the intimate classes of a liberal arts setting, I focus on discussion-based learning, problem-solving, and mentorship to empower each student to take ownership of their education.

## Diverse Teaching Experiences and Adaptability

I have been fortunate to teach and mentor students across a wide spectrum of educational settings, which has shaped my adaptable teaching style. At the university level, I served as a Teaching Assistant for undergraduate courses including Calculus I & II and Electricity and Magnetism. In these roles at the University of California, Merced and during my earlier graduate studies at Missouri State University, I led discussion sections and lab sessions, held office hours, and guided students through challenging problem sets. I also gained experience in secondary education, teaching Grade 11 and 12 Physics at Nobel Academy in Nepal. In that high school environment, I learned to distill complex concepts (like Newtonian mechanics or basic electromagnetism) into fundamental principles and engaging demonstrations appropriate for younger learners. Additionally, I have mentored *Research Experience for Undergraduates (REU)* students and summer interns at Los Alamos National Laboratory, supervising their projects and introducing them to research methods. These cumulative experiences – from high school classrooms to advanced research labs – have honed my ability to communicate science clearly and enthusiastically to students with varying backgrounds. They also taught me to be attentive to each student's needs and learning style, whether that means moving slower through calculus fundamentals or posing extra challenges to stimulate an advanced learner.

## Theory Meeting Real-World Application

A cornerstone of my teaching is the integration of theoretical knowledge with real-world application. I encourage students to appreciate that the equations and laws learned in class *describe phenomena in the world around them*. For example, when teaching Calculus or Physics, I often illustrate concepts with practical examples: explaining exponential decay through radioactive dating, or demonstrating electromagnetic induction with a simple generator coil in class. While at UC Merced, I collaborated with faculty to incorporate computational simulations into physics courses so students could numerically model projectile motion or electrical circuits, linking mathematical solutions to tangible outcomes. In high school physics, I had students build small solar ovens and windmill models to connect thermodynamics and energy conversion to everyday problems. I believe this approach aligns well with Deep Springs' emphasis on hands-on learning in a working community. Learning in a rural ranch setting provides countless opportunities for science to come alive – from understanding the thermodynamics of desert weather, to applying biology and chemistry in the farm's agriculture. I plan to design assignments and labs that leverage our environment: for instance, analyzing the energy output of the college's solar panels or studying the physics of water pumping systems on the ranch. By

continually bridging theory and practice, I aim to produce not only skilled thinkers, but also capable doers who can apply scientific reasoning to any task.

### **Interdisciplinary and Student-Centered Learning in a Liberal Arts Context**

Coming from a diverse academic background, I am a strong proponent of interdisciplinary education and the liberal arts ethos. I see physics and natural science as deeply interconnected with other fields – mathematics, engineering, environmental studies, even philosophy and literature. In my teaching, I often draw these connections. For example, while teaching Electricity and Magnetism, I might discuss the historical context of Maxwell's equations or the ethical implications of nuclear physics. In a liberal arts setting like Deep Springs, such connections enrich the curriculum and show students the broader impact of scientific knowledge. Moreover, with the small class sizes and seminar-style courses at Deep Springs (cohorts of around 13 students each year), I can tailor my teaching to individual interests. I envision offering special-topics tutorials that might combine, say, physics with sustainable agriculture (solar irrigation systems) or computational science with policy (energy modeling for climate action). My aim is to encourage students to pursue curiosity beyond traditional disciplinary boundaries, which fosters creativity and a deeper engagement with learning.

Critically, I maintain a student-centered approach in all my teaching. This means encouraging active participation, critical thinking, and a sense of ownership in the classroom. I view myself not just as a lecturer, but as a mentor guiding students to discover answers for themselves. In practice, I employ open-ended questions, group problem-solving activities, and Socratic discussions. I listen carefully to student questions and feedback, adapting my methods as needed. My experience with student self-governance in academic settings – such as mentoring student-led projects – has taught me that when students have agency, they rise to the challenge with remarkable independence and initiative. At Deep Springs, I would welcome the fact that students help shape the curriculum and even choose faculty. I am prepared to be both a teacher and a collaborator in the learning process, aligning with the college's tradition of empowering students to direct their education.

### **Fostering Independence, Curiosity, and Mentorship**

Above all, my teaching philosophy prizes fostering independence and curiosity in students. Science is not a collection of facts to memorize, but a process of asking questions and seeking answers. I encourage students to approach problems with curiosity – to ask “why?” and “what if?” – and I guide them in figuring out how to find the answers. In my mentoring of interns at Los Alamos, I made a point to have students define their own sub-projects and troubleshoot issues, with me acting as a supportive guide. This builds confidence and problem-solving skills. I plan to implement similar practices at Deep Springs by supervising student research projects and independent studies where students can explore a topic of their choice (for example, analyzing an aspect of local geology, or designing a small experiment related to solar energy). By giving students structured freedom, I help them develop as self-motivated learners – a quality that Deep Springs explicitly cultivates through its self-governance and labor system.

Mentorship is a natural extension of my teaching. In a small community, learning extends beyond the classroom. I take pride in being approachable to students – whether they need academic help or personal advice. As a mentor, I model enthusiasm, integrity, and resilience. For instance, when I taught at Nobel Academy, I would stay after class to help interested students tinker with electronics and discuss their college aspirations. At UC Merced, I often advised undergraduates on research opportunities and career paths in STEM. I will bring this same dedication to mentorship at Deep Springs, being available to students during study halls, joining them in work projects, and engaging in

nightly discussions in the boarding house. Such close interaction not only aids their academic growth but also allows me to learn from students' perspectives, creating a reciprocal learning environment.

In summary, my teaching philosophy is to educate the whole student: imparting rigorous scientific knowledge, connecting it to real-world purpose, encouraging interdisciplinary exploration, and nurturing independent thought and responsibility. Deep Springs College's pillars of academics, labor, and self-governance align perfectly with these values. I am excited by the prospect of teaching in an environment where I can know each student personally and tailor education to ignite each individual's potential. Through interactive classes, hands-on projects, and steadfast mentorship, I will strive to equip Deep Springs students with both the expertise and the values needed to become leaders and servants of humanity in the scientific realm and beyond.