Statement of Teaching for Ananda Shankar Bhattacharjee

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My fundamental role as an educator is to share knowledge and create open mindedness and enthusiasm about learning new information in the field of environmental engineering. As the field keeps changing, one of the key goals of my teaching philosophy is to provide a framework for life-long learning. I aim to help students become reflective and collaborative thinkers as well as effective communicators. I believe that the primary role of teachers is to serve as facilitators; and in that role, they should enable students to become responsible for their own learning. I view teaching as a process of encouraging students to make connections between their own experiences and the subject matter. I strive to foster critical thinking and effective problem-solving skills in students to implement in classroom, laboratory and professional environment. Keeping these immense, yet extremely fulfilling responsibilities in mind, the following core principles guide my teaching philosophy**.**

Student-Centered Learning*:* My pedagogical approach focuses on student-centered learning, which I acknowledge the diverse backgrounds, experiences, and needs of various individual students. As a teacher, I always use a variety of active learning strategies such as discussions and group activities to encourage effective communication and collaboration amongst students and instructor. Recognizing that communication styles vary from student to student. I incorporate both collaborative and individual activities into my curriculum plans to support various communication styles. Furthermore, it is essential to constantly evaluate individual learning to accommodate the needs of the students. Weekly individual activities include short quizzes and homework assignments guiding students to recall, interpret, apply, or analyze contents from lectures. Discussions and brainstorming sessions on lecture topics are two examples of engaging activities that enable students to learn from the breadth of perspectives of their peers and help them become more comfortable in expressing their own opinions and ideas. In addition, I use muddiest point technique at the end of each week asking students to turn in a written question about the most difficult or confusing part of the lecture/s for possible discussion the following week. This approach provides an opportunity for all students to voice their opinions. These strategies are effective tools to continuously evaluate the needs of my students in varying context.

Relevant Content: Real-World Applications*:* As an instructor, I encourage questions and critical thinking about the course materials and their relevance to real-world applications. This approach allows me to teach complicated engineering concepts using easy-to-understand examples. It also encourages students to actively participate in classroom activities to discuss the connection between engineering theories and their applications in the real world. I incorporate different communication styles and strive to use technologies such as visual aids to engage students in learning. I lead a project with a graduate and undergraduate student to develop short animated videos to teach high school students a complex biological process of virus infecting bacteria and its applications in engineering. Using these visual demonstrations, high school students became very enthusiastic about microbial ecology and environmental engineering by relating the biology to real-world applications in engineering. As an instructor and facilitator in students' learning, I believe that making the course content relevant to students' lives can significantly increase their interest and attention span.

Incorporating Current Research*:* Introducing current research undertaken to solve real-world issues goes far beyond merely illustrating definitions and equations. It shows the students that the materials discussed in class have significant applicability in their current and future aspects in their everyday lives. While teaching an undergraduate level biological oceanography course, I introduced an open-source bioinformatics software package for analyzing the microbial diversity. The students used this open-source platform to estimate the oceanic microbiome composition. They were able to relate it to published nutrient cycling data from similar sampling stations. The analysis done by the students during the laboratory course provided the opportunity for discussion on how microbial ecology is a critical indicator of ocean health. The hands-on training and incorporation of current research into the lecture plan proved to be very helpful for students, as they were able to link their course work to real-world issues. I would like to continue with this approach as it proved to be successful method for teaching students.

Classrooms As inclusive Learning Communities: My teaching philosophy of student-centered learning, utilizing relevant content, and incorporating current research are purposefully adopted to create an inclusive learning community in all of my classes. I believe in creating a classroom environment where all students are comfortable and enthusiastic to participate in their classes.

Teaching Through Graduate Student Mentoring*:* I intend to serve as a mentor and advisor inspiring undergraduate and graduate students from diverse backgrounds to pursue a degree in environmental engineering. My teaching and mentoring philosophy incorporate the science and practice of engineering by mixing theory and practice. The environmental engineering students need to acquire skills in planning, analyzing, designing, constructing, and operating engineered systems. I will help my mentees develop critical and creative thinking, build self-confidence, train to solve problems, work in a diverse team, uphold professional ethics and social responsibility.

Courses I can teach: Based on my teaching experiences and education, I am excited to teach/co-teach Environmental Process Engineering (EENV 204), Environmental Sampling I (EENV 243), Environmental Sampling II (EENV 242), Environmental Laws and Regulations (EENV 387), and Water and Waste Water Treatment (EENV 403) . I can also develop undergraduate and graduate courses for classroom teaching, online and hybrid Kinetics and Bioreactor Design, Bioreactor Microbiome Engineering/Wastewater Microbiology for engineers. The classroom course will empower undergraduates and graduates to design and operate innovative, efficient water and wastewater treatment biological reactors.