Philosophy of Teaching and Teaching Methodology

> People don't always remember what you say or even what you do, but they always remember how you make them feel.
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> ~ *Maya Angelou*

My teaching philosophy is to provide a holistic learning culture that fosters students' technical as well as critical-thinking skills, enhances their personal and professional development, and prepares them for the real world and global competencies. These overarching goals are incorporated in a diverse manner in all of my classes and teaching efforts. My mentoring and advising is guided strongly by principles rooted in positive psychology and resilience principles.

#1. Foster students' curiosity and instill and encourage critical thinking skills: My modules and lectures always start with "Why do/should you care?" Once students understand that the material relates to their personal lives, learning turns into deep learning. A number of scientific and political controversies provide engaging discussion material for the classroom. Some examples include: the role of microbes in biofuel production, and agricultural practices and the effect on the gut microbiome. Students connect the classroom exercise with the real-world agricultural problems and thus, their interest in the material excels.

#2. Empower students and provide a punishment-free environment to make mistakes: While I view traditional, textbook-oriented learning as an important part of introductory courses, I believe that authentic research-oriented learning should be incorporated into the curriculum at all levels of undergraduate education. I believe it is more valuable for students to learn how to find, critically evaluate, and synthesize information than it is for them to memorize a set of facts. I would like to empower students to use their microbiological skills and agricultural competencies, scientific reasoning and critical thinking skills, as well as their ability to integrate technical understanding of the subject, to find solutions to a problem of choice. Along the way, they will encounter problems and struggle, which is important for their learning and growing experience. This makes the material more engaging for students (and instructors) and teaches them the skills they need to excel in our information-rich, fast-changing society.

#3. Listen to student voices to transform teaching: I have learned to be a good teacher by always actively listening to my students. Students are valuable resources and undergraduate Teaching Assistants are even more so. Even in my online class, I ask students for feedback a few weeks into the semester. This is important as my perception of the class can differ from how it is received by the students. I also listen to my undergraduate TAs; their advice is priceless. We all need to listen more to our students and involve them in the educational process and provide them with a voice and purpose to their education.

#4. Integration of technology in the classroom, providing an opportunity for hands-on experience on the use of relevant concepts and methods applied to agriculture and microbiology: Using technology in the classroom enhances students' learning, creativity, problem solving and critical thinking. I have developed a true passion for using, integrating and sharing technology in my

teaching activities and also supporting young TAs and peers within the department. Over the years, I came to realize that teaching students the use of technology is as or more important as teaching them the fundamentals from a textbook only. I use a large variety of technology in all my classes and make the tools relevant to the real world and their future careers. This includes excel for data analysis and graphing exercises, a variety of bioinformatics tools for sequence analysis, GIDEON (global infectious disease network database) for pathogen identification, foodsafetyfirst.org for growth curve simulation, to name just a few. This is above and beyond using advanced, state-of-the art equipment like a spectrophotometer, microscope, PCR machine, image analyzer, micropipettes and other lab utensils. For online teaching I also used advanced instructional technology to engage students.

#5. Providing state-of-the-art information on the subject area delivered in an interesting and comprehensible manner: The future of the ideal microbiology laboratory has been discussed for years; yet, few institutions have made radical changes. Incorporating recently developed diagnostic techniques and advances in computer technology and on-line learning tools can motivate the tech savvy "Generation Y" students to learn more and participate in lab activities. Although the standard microbial techniques will have to be taught, the excessive reliance on the traditional approaches to teaching microbiology labs may not adequately prepare students for the real world. It has been my experience that students' learning is enhanced through simultaneous use of technology, wet and dry labs, and discussion of primary research papers. As the field of microbiology has expanded and increasingly become interdisciplinary, the basic microbiology laboratory has to encompass basics of bioinformatics, genomics, molecular biology and modern diagnostic tools. These skills are necessarily to solve many of the problems in agriculture.

#6. Help students make informed career choices. I believe that many of our undergraduate students have limited exposure to the variety of career paths available to them. To address this issue and to help students make informed career choices, I developed a course called "Careers in (Micro)biology – Plan B". In this course, I expose students to various career opportunities available to them, invite general and medical microbiologists to give guest lectures and get them connected to scientists who have successful careers in microbiology or related fields. Students not only get exposed to careers pursued by the guest lecturers but also get connected with the world-class scientist who can become their potential advisor or mentor. Finally, I closely work with students to develop a resume, prepare job applications and perform mock interviews.

#7. Globalize and internationalize my curriculum to foster global citizenship and international awareness: Instilling global citizenship and international understanding are essential to our role as educators in CALS. "Globalization of the Gator Nation" has been my theme since I started teaching at UF in 2010. My unique study abroad program, "Medicine, Microbiology and Health" (ALS4404) explores agricultural and medical applications of microbiology in Holland, Germany, France and Switzerland. "Microbes without Borders" (MCB2006) is part of the International Scholars Program (a medallion program at UF that encourages and rewards students who internationalize their curriculum) and is now also available for dual enrolled high school students. UF's microbiology lab classes, which I redesigned (MCB2000L – Microbiology Lab, MCB3020L – Basic Biology of Microorganisms Lab and MCB3023L – Principles of Microbiology Lab), explore global issues as part of the curriculum. Our career class (MCB3933 – Professional Development in Microbiology and Cell Science) also explores international careers and as undergraduate coordinator and mentor to many, I strongly encourage international internships, study abroad, participation in the International Scholars Program and more.

#8. Excel in and embrace online education. Providing high quality online education is challenging for all of us as we have to learn new tools and skills. However, this is essential to serve our students best. I have worked with instructional designers at UF for two years and I strive to provide highest quality online education.

#9. Provide inclusivity, and positive education and dynamic mentoring. Inclusivity in the classroom and during advising sessions is ever more important during these daring times, when many students suffer. Understanding each group of students and embracing their uniqueness is important. Positive education principles in the classroom and impact the teaching didactics to accomplish inclusivity and integration in any classroom. "Dynamic mentoring" a term I coined, is the integration of a variety of educational and psychological theories to provide personalized mentoring for each and every student regardless of their background, nationality, orientation, career path, etc.

Dynamic Mentoring
Correlating Maslow's needs with mentoring outside the comfort zone:
The zones are different for different students and different situations