Katherine Slyman
TEACHING STATEMENT
kslyman@ad.unc.edu
https://tarheels.live/slyman/

Introduction

Having my undergraduate degree in mathematics education has given me a unique perspective in what it means to be an effective teacher. Over the last ten years, I have had the opportunity to teach a wide range of courses, with students ranging in age from middle school to graduate students. Teaching at two academic institutions and two high schools allowed me to teach students of diverse cultural and educational backgrounds, trained me to cultivate a high level of comfort in the classroom, and facilitated my development and growth as an instructor. My success in the classroom comes from my teaching methods and philosophies, and my continuous self-assessment. I am committed to actively engaging students in highly-structured courses where my students learn valuable critical thinking and problem-solving skills.

My ultimate objective as a teacher is to make sure the students have a fundamental understanding of the material that is being taught, and to be able to apply it in further mathematics courses and beyond, across other disciplines. I emphasize and encourage logical and critical thinking skills that can be applied inside and outside of the classroom. I want my students to have a growth mindset, understanding they are beginning a journey in the course. If they do not understand initially, that is okay, and we will work together to facilitate continuous improvement. This creates an environment that optimizes student learning.

My teaching style and philosophy continue to change. To develop as an educator, I attend workshops and trainings to better understand the best practices in active learning, inclusive teaching practices, and diversity in academia. I ask for feedback throughout the semester from my students and reflect on my end of course teaching evaluations. Experienced faculty and peers observe my courses, and I observe them. This elicits continuous feedback between us and I gain outside perspectives. I enjoy collaborating on course materials and like to share ideas and develop content with peers. This continuous self-evaluation allows me to grow as an educator, helping my future students.

Below are the highlights of my teaching pedagogy, following by evidence of my teaching effectiveness, and a table of courses I have taught.

Student-Centered Learning

I arrive in the classroom early to walk around and talk with students, giving them the opportunity to ask any questions before class begins and to build rapport. Class begins and ends with reminders, relevant due dates, and other pertinent information for that week to help students stay up to date on tasks I have assigned.

The class consists of a combination of interactive lectures and group work of 2-4 students. In lecture, I have graphical, analytical, and when appropriate, physical examples to highlight the concept in a variety of modalities, as multiple ways of engaging with the material benefits all students. Throughout lecture, I ask guiding questions such as "what do you think the next step should be" or "how can we apply this concept here", to take students from applying and analyzing to evaluating and creating knowledge.

I often ask students to compare answers with a partner or discuss as a large group. I believe one of the best ways to learn is by explaining one's thoughts to others and thus I give ample time for collaborative learning, giving an opportunity for students to explain concepts to their fellow classmates. Whenever there is partner or group work, I walk and talk around the classroom, reminding students of steps or misconceptions, and I look at their work and listen to their discussions. I can observe if students are working productively or unproductively. If it is an unproductive struggle, I bring everyone's attention back to me and go through another problem together before having them retry group work.

The exercises I provide range in purpose from reinforcing initial concepts to using applications to take the problem into real life. When dealing with students of different aptitudes, I create my problem sets to also include a variety of problems that cover different levels of difficulty. I build on the previous examples, starting with the easiest and adding more complexity until it is an intricate problem. I then provide multiple solutions for students to aid them in connecting topics and concepts. I also provide examples related to a wide range of social issues. For instance, in my differential equations class, we studied population crashes by over-harvesting, spread of disease, and extremist political opinions. Students learn the math related to these issues and get to discuss the role of different factors as a class.

I use a variety of active learning strategies in the classroom to provide students with a more equitable

chance to participate in class. Specific techniques include Think-Pair-Share, allowing students to first think individually about a problem and then to share their ideas with a partner, and anonymous polling on Poll Everywhere. These techniques aid in student engagement as some students may feel uncomfortable speaking aloud in class and are more likely to express their thoughts in small groups. With practice, students learn to talk comfortably about math and become more involved in the classroom. For example, while teaching differential equations, I split students into groups and within each group they had to derive Euler's Formula. Afterwards, each group selected a spokesperson to present one step of their solution to the class.

To aid in the effectiveness of my teaching, I make use of the interests of my students, use technology to provide visualizations, and use engaging language. After several semesters of remote teaching, I brought new tools into the physical classroom including graphical demonstrations with Desmos, recording lectures, posting notes, using interactive whiteboards on Explain Everything, and posting 5-minute videos of me working out an extra example. These resources aim to reach students of all abilities and backgrounds, ensuring equity amongst my students.

Inclusive Learning Environment

I bring my love and enthusiasm for mathematics into the classroom, and I strive to create a safe learning environment. The students and I work together to establish a positive error culture in the classroom, in which students should not be afraid to ask questions, and where mistakes while learning are normalized and expected. Together we determine why the mistake happened and how to correct it moving forward.

On the first day of class, I have the students introduce themselves to their neighbors and talk to those around them to establish relationships with others in the classroom. I also have them fill out index cards with what they prefer to be called, their pronouns, major, and interests. I am determined to learn all student names by the end of the first week of classes. I can then call and address them by name, and establish personal connections with my students that I can use to help motivate them. After exams, I send emails to those who showed increased performance, highlighting their growth, and I reach out to those who did poorly, offering them time to meet personally. Knowing my students and showing I care about them makes them more willing to ask questions in class or attend office hours. This level of comfort in the classroom, and with me, help change attitudes of students and help them grow in their math abilities.

I encourage participation in office hours. However, not all students will be able or willing to attend office hours and these students may benefit more from online tools and resources. For example, an online forum like Piazza allows students to post questions about course content, respond to questions from their peers, and receive direct feedback from the instructor.

Assessment

In addition to using summative assessments to evaluate how much my students have learned, I use formative assessments regularly in the classroom to gauge and evaluate how my students are feeling about the material as I teach it. I can see what needs to be reiterated, taught in a different manner, or if I need to spend more time on a concept. One example of a formative assessment that I use is asking my students to hold up one, two, or three fingers to describe how they are feeling about the material, where one means feeling bad and three means feeling great. Students are comfortable enough to put up one finger when necessary, as together we established a classroom culture where we normalized incremental improvement. I can easily see how the students are feeling and can make the decision to continue in the lecture or do more examples and/or group work to help solidify the current concepts.

For homework, I give a mix of straight-forward exercises, real life applications, and open-ended questions that are more exploratory in nature. The application and open-ended questions help develop critical thinking. I then create my summative exams to be based on the main topics, with questions to indicate different levels of mastery by students. I use a backward design approach when writing exams, and thus I consider the learning objectives of the course first. In pursuit of scholarship in student learning, I began implementing cognitive wrappers in Summer 2022. These wrappers are used to direct students to review their exam performance, and my feedback, with an eye toward adapting their future learning.

On this page is evidence of effectiveness in the form of awards, student evaluation excerpts, and trainings. A teaching portfolio is available upon request. This portfolio includes samples of syllabi, lessons, exams, and worksheets, and all of my student and faculty evaluations.

Awards and Recognitions:
• J. Burton Linker Award, *awarded to one math graduate student by the UNC Math Department annually for excellence in teaching.*
• Senior Teaching Fellowship, *awarded to one math graduate student by the UNC Math Department annually, and involves co-teaching first-year math graduate students to be effective instructors.*

Selected Professional Development Trainings:
• Beyond Think-Pair-Share: 10 Strategies for In-Class Small Groups
• Pedagogies of Care and Compassion
• Workshop for Inclusive Teaching Practices
• LGBTQ+ Allyship in the Classroom Workshop

Excerpts from Student Evaluations on the Following Themes:
Inclusive Learning Environment:

- She is so wonderful when it comes to making an open environment that encourages questions. I've never felt more comfortable to ask consistent and detailed questions, and I could tell other people did too. She's super encouraging and takes her teaching very seriously.
- She also would always answer everyone's questions and normalized people asking questions to create a safe and open learning environment.
- She periodically asks if we understand/that concept or example went ok for us during class is so so so powerful and helpful in making us feel accepted, appreciated, valued, respected, and heard in the classroom.
- As a student with a learning disability she the best professor I have had at UNC to really understand my needs as a student and provided me fully with the resources I needed.
- Professor Slyman knew every single one of our names on the first day of class. She ALWAYS used a students name when referring to them.
- She is able to connect with the students beyond just the subject matter and takes a real interest in what we have going on outside the classroom and who we are.

Challenging, Rewarding Course:

- She considers student perspective and is open to feedback even before course evaluations, which meant that she continued to improve the quality of the class throughout the semester. I didn't feel like I was just memorizing equations to pass an exam, everything felt like I had actually learnt it.
- I am beyond thankful to have had the pleasure of being her student. I can honestly say that she has inspired a new passion for learning in me, a passion I will carry not only throughout the rest of my time at Chapel Hill, but also throughout the rest of my life.
- This course definitely challenged me, but it was a challenge that will benefit me in the future.
- Guidelines were clear and it always felt like I was being challenged rather than tricked in exams and quizzes.

Active and Collaborative Learning:

- Her teaching logic is great and actively involved students in class.
- There were many opportunities to work with other classmates throughout this course, hearing how others solved problems enhanced my understanding of the concepts.
- Everyone can comment their thoughts and ideas on different equations and explain where their thinking comes from.
- She is a very good, engaging teacher who made learning math fun.

Courses Taught

Below are the courses I have taught at both university and high school levels, the amount of times I taught each course, and the class size per course.

University Level Courses

Course Name	Times Taught	Class Size
Teaching Seminar	1	17
Differential Equations	1	23
Business Calculus	2	46, 50
Precalculus	2	56, 72
Calculus I	5	30
Multivariable Calculus	1	30
Methods of Applied Math for the Comprehensive Exam	1	12

High School Level Courses

Course Name	Times Taught	Class Size
AP Calculus	1	15
Precalculus	1	30
AP Statistics	2	10, 13
Trigonometry	2	30