Teaching Statement: Kateryna Husar

Portfolio link: https://kathusar.github.io/

Guiding Philosophy: From Memorization to Mastery

My teaching philosophy is grounded in a statement from my eighth-grade teacher: **"I can't teach you everything in this subject, so my goal is to teach you to learn."** This sentiment forms the core of my approach, shifting focus from content coverage to the cultivation of enduring skills. My ultimate goal is to help students develop **confidence** in using data to understand and shape the world and equip them with the ability to **interpret evidence critically and communicate it clearly**. These analytical tools and habits of mind have a lasting impact, whether my students become researchers, data analysts, or informed consumers of scientific information.

Tailoring Instruction to Diverse Learners

I realize this philosophy through a commitment to **student-centered experience**. I have been privileged to work with a diverse population across Duke, including non-majors fulfilling their quantitative requirement (STA 101), to freshmen in STA 199, to statistics majors in STA 221, and seniors completing STA 470. This range of experiences has transformed my approach, moving me away from the objective of covering "expected" material toward helping students identify what is **essential**—the ideas that will serve them long after they forget specific syntax or formulas.

Fostering Statistical Literacy (Non-Majors)

In non-major courses, my goal is to develop **statistical literacy**—a practical understanding of key scientific concepts like p-values, confidence intervals, and odds ratios, and how they support evidence-based decisions. I employ a **"Why before How"** framework that emphasizes motivation and relevance. For instance, a valuable introductory activity involves analyzing a scientific article and identifying the statistical tools needed to evaluate its claims. This provides a **student-driven motivation** for the subsequent topics.

To limit the stigma of "I'm just not good at math," I focus on fewer but highly relevant topics and ensure the subject application is personally meaningful. For their semester-long project in **STA 101 (Data Analysis and Statistical Inference)**, I encouraged students to pursue a topic of genuine personal interest, engaging them in the subject.

Cultivating Theoretical Depth (Majors)

For statistics majors, I emphasize the connection between **theory and modern practice,** focusing on *why* methodologies matter, *what* assumptions they rely on, and *how* to deal with assumptions that fail. When serving as a Teaching Assistant for **STA 221 (Regression Analysis)**, I utilized labs and office hours to discuss the **intuition behind the theory** by

intentionally exploring “messy” data. For example, we examined a small mock data set exhibiting perfect **collinearity** to precisely observe where the estimation process fails and how that critical failure impacts the interpretation of the model.

> *“Kat made sure to be patient and encouraged us to understand the process by applying it instead of just memorizing.”* (STA 221 student)

This direct feedback validates my approach of prioritizing applied understanding over mindless memorization, demonstrating that students are meeting the goal of developing **process-oriented critical thinking**.

Authentic Assessment and Real-World Inquiry

Students learn statistics best when encouraged to explore, experiment, and make sense of uncertainty. My courses balance structure and flexibility: lectures emphasize intuition and interpretation, while labs and assignments provide hands-on practice with real data.

Real-World Inquiry

In STA 101, I guided students through designing and analyzing their own semester-long projects. Early in the term, they proposed research questions, and throughout the semester, we built the statistical tools necessary to answer them. Regular check-ins and structured feedback fostered engagement and accountability. In my small class of five, I met individually with each student to tailor their projects. This model extends to other courses like STA 199 and 221, where I supported group projects with continuous feedback and iterative review. At each step, I revisited prior comments to ensure progress and reinforce learning.

These projects serve as **authentic assessments**, testing whether students can transfer technical proficiency into conceptual understanding and clear communication. They also allow students to confront real-world ambiguity, take risks, and experience the creative, iterative nature of data analysis.

Formative Assessment and Continuous Improvement

Assessments in my courses are designed to **support learning**, not just measure it. I rely on low-stakes, formative activities that provide real-time feedback to both students and myself. In STA 221, students anonymously voted on challenging topics, allowing me to adjust pacing and revisit difficult material immediately. I also analyzed commonly missed questions on homework and exams with other TAs to identify conceptual gaps and refine instruction collaboratively.

Instructor Evolution

This feedback loop extends to **instructor self-assessment and continuous evolution**. When I identified recurring struggles with linear algebra in STA 221, I developed a new **“Lab 1”** reviewing core theoretical concepts. The following semester, student mastery improved

substantially, and the lab is now used by other instructors. This experience reinforced my conviction that courses should evolve based on evidence of student learning.

To keep my teaching relevant, I connect statistical ideas to modern contexts—such as decision-making models and A/B testing in companies like Netflix or TikTok—to demonstrate real-world applications. I also prepare students for the **evolving technical landscape**. While manual calculations build foundational understanding, I emphasize conceptual depth and adaptability over procedural repetition.

We no longer focus on completing complex calculations by hand; we acknowledge that computers are faster and less error-prone. While completing a few manual calculations to develop foundational skills is important, focusing solely on outdated methods limits the opportunity for deeper exploration. Incorporating current trends, like the growing presence of **Artificial Intelligence**, is therefore critical. I encourage students to think critically about its strengths and limitations—identifying problems where it fails and tasks where it excels.

In statistics, we use R very often, but the **ultimate goal is not mastering a single tool like R.** Instead, I emphasize **algorithmic thinking and documentation reading**. Students should not feel unqualified when a tool becomes obsolete. They must learn to adapt. I encourage them to explore how other languages can be used to perform similar tasks, even assigning them to use ChatGPT or similar resources to **translate or compare code across platforms**. This approach fosters **independent and adaptive learning** in a fast-changing field.

Fostering Inclusion and Belonging

What most defines me as an instructor is my desire for students to feel **heard and seen**. Inclusive teaching begins with active listening. At the start of each semester, I send a “getting to know you” survey asking about students’ prior experiences, learning preferences, and what has motivated or discouraged them in quantitative subjects. This helps me adjust communication and class structure to support diverse learning needs.

I aim to create an environment where every student feels capable of success. I openly acknowledge that statistics can be challenging and that confusion is part of learning. To humanize the classroom, I share my own experiences with academic struggles and test anxiety, showing that perseverance, not perfection, leads to success.

I emphasize **growth and effort** over grades, reminding students that a single assignment or exam does not define them. Especially in introductory courses, I reassure them that it’s okay not to excel in every subject—what matters is consistent effort and curiosity. Recognizing and celebrating incremental progress builds both confidence and resilience. While students may eventually forget course content, I hope that they carry forward a strengthened work ethic and a deeper understanding of how to learn and grow.

Evidence of Teaching and Mentorship

My teaching experience spans multiple roles and levels, reflecting a broad commitment to pedagogy and mentorship. At Duke University, I have served as a Teaching Assistant, Head TA, and Instructor of Record for various courses. I have also guest-lectured in both STA 101 and STA 221, and held TA roles at Ohio State University in mathematics and computer science.

Beyond formal teaching, I have mentored undergraduate research teams through Duke's **Data+** and **Bass Connections** programs. I am especially proud of the Data+ team I led, where students evolved from hesitant beginners to confident collaborators who created a public-facing tool for the Polarization Lab. In Bass Connections, I guide students in managing complex, messy data and achieving feasible goals. I have also deepened my one-on-one teaching skills through tutoring with the **Spire Fellows** program, adapting explanations to each student's background and learning style.

Across these settings, I have learned that teaching is a **continuous process of reflection and adaptation**. Each cohort brings new perspectives, and the same course can—and should—evolve every time it is taught. I strive to model this adaptability for my students, demonstrating that learning is never static and that curiosity and reflection are lifelong habits.

Commitment to Growth and Impact

Teaching at Duke has allowed me to cultivate this philosophy across diverse classrooms, emphasizing adaptability, deep conceptual understanding, and student empowerment. I remain committed to advancing a **student-centered and evidence-based approach** in every setting, from my current mentorship roles to the future development of the **FOCUS program course on History of Statistics** over the next couple of months.

By teaching students **how to learn**, I equip them not just for their careers but to become informed, thoughtful participants in a data-driven world.