

# TEACHING STATEMENT – ANDREW KOBIN

## 1. INTRODUCTION

In a rapidly changing academic world, I seek opportunities to hone my teaching and communication skills, while crafting my pedagogical goals as an educator in and out of the classroom. In a broader sense, effective teaching techniques have also improved the clarity of my mathematical writing and speaking.

## 2. UNDERGRADUATE INSTRUCTION

As a postdoctoral fellow at Emory, I have taught a range of courses across the department, including undergraduate advanced calculus, linear algebra, number theory and abstract algebra. In past positions, I also taught calculus I and II, financial math, abstract algebra and advanced linear algebra. Materials for many courses are available on [my website](#).

**Active Learning.** As a graduate instructor at the University of Virginia, I trained as a flipped classroom instructor, and I have continued to teach courses in this format in my postdoc positions. In the flipped classroom format, class sizes are limited, students are divided into small groups, and the instructor’s role is quite different than in a traditional lecture format. Before each class, students watch a short video introducing the topic for that class and then answer several basic questions about what they learned. When they arrive to class, the students work in groups to grapple with the material in more challenging ways – usually this includes harder versions of what they saw before and more conceptual questions that require a deeper understanding of the material. While it takes time for students to adjust to this unconventional learning environment, it is more rewarding in the end. As one student in Fall 2018 confided on their course evaluation,

*“I was hesitant about the flipped classroom method, but I think it allowed me to be a more independent learner”.*

My experience creating video lectures also paid off during the COVID-19 pandemic, when I taught a large (330 person) calculus course at UC Santa Cruz. To accommodate students with different levels of technology access, I taught asynchronously, recording video lectures to introduce new material and work through helpful example problems, before turning students loose on questions developed during the lecture. I also utilized an online discussion forum to facilitate student questions outside of office hours and TA sessions, which has been a mainstay of my courses in the years since.

I later brought my flipped classroom experience to Emory, teaching two semesters of advanced calculus for data science in this format. This course (Math 210), designed specifically for data science students at Emory, combines aspects of standard calculus II and III courses with Python coding labs to prepare these students for the mathematics needed to pursue a career in statistics or data science.

**Feedback.** One tool I have used for many years in my courses is a feedback form for student reflections. Before the end of each week, I ask students to answer four questions through the course webpage:

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- (1) What they learned this week;
  - (2) What they need more help understanding;
  - (3) What went well for them this week; and
  - (4) What did not go so well.

The impact of these reflections is two-fold. First, I am able to tailor the class to students' needs and respond quickly to problems that arise. Second, in having their feedback heard and often acted on, the students feel an increased ownership in the class. For the price of a small amount of extra time each week, I am able to make real improvements in my students' learning experiences. I have observed these benefits in every course since I started using reflections in 2018.

While I take my role as an instructor seriously, I am also quick to express my excitement in the classroom. In recent years, I have received the following comments through online course evaluations.

*"[He] always knew how to explain things in a way that the students understand."*

*"Kobin was very knowledgeable and professional. Great, confident instructor."*

*"He challenged us to work harder."*

*"I honestly loved the professor... He had a lot of energy...and brought a genuine love and interest to the class that it was hard not to want to pay your utmost attention."*

I am not without my flaws, however, and have received criticism in earlier courses, such as

*"Very knowledgeable, but sometimes had difficulty reading whether his students were understanding his lectures"*

Such feedback has motivated me to improve my communication skills and become more sensitive to my students' needs, which I feel is reflected in the later student comments above.

### 3. GRADUATE INSTRUCTION

As a visiting assistant professor at the University of California-Santa Cruz, I taught one online graduate course on Lie groups. I have also devoted significant time to organizing reading courses, seminars and other learning opportunities for graduate students, both in my years as a graduate student and now as a faculty member.

For the Lie groups course I taught at UC Santa Cruz, I devoted serious thought to the structure and atmosphere of the course, especially as the COVID-19 pandemic prevented us from meeting in person. Ultimately, I opted for a twice-a-week synchronous meeting over Zoom, during which I lectured using partially prepared notes with gaps for students to help fill in. Samples are available on my website for this and other courses. I received a great deal of feedback that students felt supported and enabled to learn this way. The course also encouraged me to seek out more opportunities to teach future graduate courses.

### 4. MENTORING AND OTHER ROLES

Outside the classroom, I have taken a direct role in the mathematical development of undergraduate and graduate students. These efforts include organizing the Algebra Seminar at Emory, mentoring an undergraduate student through the Emory Math Directed Reading Program, organizing two summer REU projects at Virginia, chairing the graduate seminar at Virginia and co-organizing various reading courses. In 2023, I was an organizer

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for the Mathematical Research Community (MRC) conference “Explicit Computations with Stacks”, which kickstarted a vibrant and ongoing community of arithmetic geometers.

In recent years, I have expanded my pedagogical skillset in other ways. As part of a panel series I co-organize, [Lunch in the Time of Covid](#), participants have discussed a variety of strategies for mentorship and communication, both at the university level and for K-12 educators. I have already incorporated some of these strategies into my own teaching and mentorship practices.

In the future, I plan to continue creating community in the various ways already mentioned. I am also eager to mentor undergraduate and graduate students more directly as an adviser. Many of the projects described in my research statement are vertically compatible, and I have a number of other projects I would like to introduce to the next generation of mathematicians.

## 5. IN CLOSING

I chose mathematics as a career because I admire the values of the mathematical community, which include communication, pedagogy and generosity. I am committed to embodying these values as a teacher and colleague, and believe I can make a positive impact on the institution I represent.