

## TEACHING STATEMENT - YOTAM SMILANSKY

Teaching is a central part of my work and identity as a mathematician, and the source of much of my professional satisfaction and pride. It is a privilege to meet students at an early stage of their academic life and to have the opportunity to direct them in their first steps in the world of rational thinking, and I appreciate how influential a teacher can be for better or for worse. In my time at Rutgers and Tel-Aviv University I have designed and taught a wide variety of courses for mathematical sciences, engineering and life and social sciences programs in the capacity of instructor, course coordinator and teaching assistant. These include instructing different levels of first-year calculus and linear algebra courses, as well as advanced courses such as probability theory and complex analysis. As a teaching assistant I have also taught real analysis, number theory and algebraic structures, courses given in a level commensurate with graduate programs. The detailed list of courses appears in my CV.

A central theme in my teaching philosophy is that mathematical thought belongs to all, and that anyone who sets their mind to it should have access to its advantages and beauty. From the point of view of learning environment, my students know that in my classes we gather to learn, think and study together and on fair grounds. I encourage open discussion and group study during class in order to engage as many students as I can and promote effective and active learning. I do my best to simplify and demystify abstract ideas by supporting my lectures with real-life examples. I constantly encourage my students to be actively curious and I guide them to useful techniques to help them study effectively. I maintain a good rapport with my students and I am always available for questions, advice and support during and after class. I feel that due to my own difficulties during the first year of my math undergraduate studies I have a good understanding of some of the obstacles one needs to overcome when making the leap into university level mathematics, allowing me to help also the struggling students in class. A testimony to this is in an email I recently received from a first year Calculus 1 (Rutgers Math 135) student, together with some quotes from recent teaching reviews:

*“Dear Professor Smilansky, I’ve never written an email like this before. This email might make absolutely no sense, but I feel the best way to write an email like this is to not edit it at all and write things as they come from my head. You are one of the greatest humans I have ever met. Your genuine passion and caringness for your students is completely unmatched. I have never had a teacher like you that genuinely cared about the well being of their students, and wanted them to succeed at the best of their abilities. I have always been someone who struggled with math and absolutely despised it. But something was different about your class, I genuinely wanted to go to class and learn calculus. Although I still struggled with math this semester, for the first time I genuinely felt like I understood the concepts and knew what I was doing and why I was doing it. I know the lack of participation in our class drove you crazy (I was definitely part of the problem there) but you did not let this affect your lectures at all, you still continued to teach and care about every single one of your students and put them in them in the best possible situation to succeed. Your kindness was not only in your lectures but outside of them too ... you went out of your way to make my life easier. You have made such an amazing impact on my life and I thank you for that. You made someone who hated math their whole life enjoy it, and I can say you made me a better person by showing me how just being kind to people can make such a huge difference in their lives. I felt the least I could do is to let you know how much you impacted me.”*

- “Professor Smilansky is an amazing Professor, his care for his students and encouragement to help us learn enabled me to grow and to believe in myself to do better, he really helped me to learn more effectively and grow as student.”
- “The teacher was fantastic and made the information easy to understand.”
- “He encourages you to do better rather than reprimand you for doing bad.”

- “Really love your slides! They are beautiful and clearly organized. I am lucky to be a student in your section!”
- “I was able to understand real-world applications of what we were learning in class.”
- “He was encouraging to students all the time, and really tried to help students who didn’t understand the material.”
- “Professor Smilansky made me want to learn.”

Another way in which my teaching philosophy is implemented is by demonstrating, where possible, that mathematical thought has developed across different cultures and civilizations throughout the ages. For example, I was able to emphasize this when teaching number theory, where I complemented my lectures by presenting historical sources that originate from Asian, Mediterranean and Western European civilizations, or, for example, by comparing medieval manuscripts of Euclid’s Elements in Latin, Hebrew and Arabic.

I am experienced in teaching independent sections of advanced courses and multi-sectional coordinated first-year calculus courses, as well as in-person and online sections. The requirements and challenges change with different types of courses, and I have learned to modify my teaching methods accordingly. Teaching independent sections allows the freedom to pursue personal tastes but requires discipline and responsibility. On the other hand, teaching first-year coordinated courses within a very large teaching staff requires the maturity to be flexible and work in collaboration, and I enjoy finding new ways to implement my teaching philosophy while working in coordination with other instructors. I gained additional experience as a course coordinator at the Tel-Aviv University engineering program, shaping the structure of courses, overseeing the examination and grading process and liaising with the university administration if any special issues emerged. Subsequent instructors still regularly use my design and notes as a framework for their course and share my resources with their students. To overcome the challenges of online teaching during the outbreak of the COVID-19 pandemic, I created well-organized colorful hand-written illustrated lecture notes to construct friendly live online lectures, specially tailored to help fight “Zoom-fatigue” with many extra short breaks and breathers. I supported and encouraged students in the constantly changing situation, and did my best to reduce the sense of uncertainty by sharing the course resources, syllabus and policies in the clearest way possible while maintaining flexibility and attentiveness.

Beyond contributing to existing courses and modules, I would be very excited to design and present a graduate course in aperiodic order. The course, which would be suitable to first year graduate students, would concern mathematical models of quasicrystals and their dynamical and spectral properties, integrating tools from dynamics, combinatorics and spectral analysis. In particular, we would discuss such beautiful constructions such as the Fibonacci word and the Penrose and pinwheel tilings, and various measures of complexity and disorder. To complement the mathematical discussion we could discuss examples such as patterns that appear in Islamic art or the work of M. C. Escher. Aspects of this material are also accessible to interested undergraduates with basic knowledge of linear algebra and a good geometric perception, and are naturally suitable for undergraduate guided reading and research projects.

Teaching has been fulfilling and rewarding for me personally. I believe I am considered a responsible and dedicated teacher by my colleagues and by the students I teach, and other instructors regularly base their courses on my notes. My teaching reviews consistently rank very high (examples appear on <https://sites.math.rutgers.edu/~smilansky/>), and I use them to further improve my work. I have received many teaching distinctions at Tel-Aviv University, including the excellence awards for teaching and for teaching assistance at the School of Mathematical Sciences, two excellence awards for mathematics instructor at the Faculty of Engineering, and several inclusions in the Rector’s list of 100 outstanding junior staff teachers.