

Teaching statement

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I'm passionate about teaching mathematics at all levels, ranging from advanced graduate topics like homotopical algebra and topos theory over undergraduate topics like linear algebra to topics aimed at interested secondary school and high school students.

I have considerable experience at teaching, starting in my second year at university with correcting homework and giving exercise lessons and gradually taking over more tasks. For the past four years, I had full responsibility over devising exercise sheets and supervising student tutors, held exercise lessons both in front of small and large audiences, and helped in drafting exams.

At the University of Augsburg, it wasn't officially possible for PhD students to give lectures. However, I designed and gave courses on category theory, constructive logic, and topos theory at "pizza seminars", self-organized seminars for motivated students. Each of those courses was accompanied by tutorials. Now that I'm substituting a junior professor who is on leave, I'm teaching a self-devised master's course on sheaves and logic which students can earn ECTS credit points for.

Although not directly relevant to the position I'm applying for, I'd like to remark that I founded and have since been continuously running a voluntary program for interested school students to visit us on campus every two weeks and join us for a week-long mathematics camp during the summer break. It's a challenge to convey advanced topics like ordinal or p -adic numbers to children as young as ten in a way that preserves central ideas while omitting technicalities, and it's amazing to see children pick up such concepts and play with them.

One of my favourite activities is preparing lectures and talks. Starting from a rough outline, I like to run the script in my head to gauge how it might be received and to gradually enrich it with details, examples and non-examples, motivation, and background. As a student, I liked lively lectures with clear structure, and I strive to adopt this ideal. After delivery, I take notes so that I can improve future repetitions.

I particularly like comparing different angles on how to present a topic and to work out a "best" point of view for the specific purpose at hand, in the process honing my own understanding of the subject. I know when standard presentations are appropriate and when it's useful to deviate from those, and I'm experienced in phrasing statements and proofs in such a way that they can be interpreted more generally than explicitly written (for instance, such that the real numbers can be substituted by any base field or that the proofs are valid even when measured against the stricter requirements of intuitionistic logic).

I'm heavily invested in my students and sad when they don't perform as well as they envisioned. Therefore I engage with my students on more occasions than the allotted time slots. I like to walk around campus and discuss mathematics with study groups. For struggling students, I give supplemental lectures summarizing and practicing the course material (but not directly before an exam – I don't want to hurriedly teach algorithms so that students barely pass, but instead strive for a more profound level of comprehension developing over the course of a full term). For the stronger students, I give further high-level background, discuss advanced topics, and encourage them to organize or take part in student-run pizza seminars. In 2013, my commitment was recognized by an award for excellent teaching by Augsburg's student representation.

I believe that the best way to thoroughly communicate understanding is a face-to-face conversation. The second-best way is to develop the material at an appropriate pace using an old-fashioned blackboard. However, I regularly enhance such presentations with beamer slides and I also like to give beamer-only lectures when appropriate (for instance for overviews without detailed proofs). In seminars, I try my best to establish an informal atmosphere where everybody feels welcome to interrupt with questions or remarks at any time.