TEACHING STATEMENT

VÍTĚZSLAV KALA

1. Overview

I love working with students, and so teaching has been a substantial part of the fun I have had with mathematics throughout my career.

Equipped with some experience from organizing mathematical correspondence seminars, I started teaching at the Department of Algebra at Charles University already in my second undergraduate year 2005/2006 when I taught the recitation for *Number Theory and RSA*. There I noticed that many of the students lacked experience with elementary number theory that was needed in the class, and so next year I initiated the creation of *Number Theory Proseminar* for freshmen. The course has continued running with big interest of students ever since then.

I taught eight recitations and four lectures on number theory and abstract algebra in Prague overall, also in the last year 2015/2016. Although I had a visiting position at the department with no teaching duties, I still taught two advanced, elective courses on number theory. This was a great way of sharing some challenging, yet fun and modern topics with the students.

The Ph.D. studies at Purdue University in the US presented a different challenge of teaching at a much more elementary level in the form of first calculus course for business majors, *Introductory Analysis I*. This was an obligatory class for the students, and so most of them were only interested in passing it with as little effort as possible. Still, by explaining the material clearly and by including stories and jokes (often from Czech context), I believe I succeeded in making the lessons engaging and through that in increasing the students' willingness to learn. I taught the total of four classes each with 35 – 40 students; in the last semester the overall evaluations from my two sections were 5.0 and 4.7 (out of best possible 5), and a number of students told me that this was their first enjoyable math class ever. Complete evaluations from one of my classes are available at `http://atrey.karlin.mff.cuni.cz/~vitek/files/purdue-eval.pdf`.

Since 2015 I have also been advising Master's and Bachelor's students in Prague on different topics in algebraic and analytic number theory. So far I have supervised the theses of seven students, four of whom have already successfully graduated. It has been an enjoyable and enriching experience, hopefully not only for me, but also for them! In fact, several of my students have already obtained (or are close to proving) original results and we are planning to apply for a student project from the Grant Agency of the Charles University to support them.

As I greatly enjoy collaboration and sharing ideas with other mathematicians, I have started a number theory seminar at Charles University in Fall 2015. Although number theory is not one of the traditional research areas in Prague, the first year of the seminar went really well with a typical attendance of ten to twenty people, including not only local faculty and students, but also people from other departments and even from Czech Technical University.

I hope to enjoy teaching and working with students (and to keep improving in it) also in the future.

2. Teaching

University of Göttingen, Germany

- Analytic Number Theory I (assistant), Winter 2016

Purdue University, USA

- MA22300 Introductory Analysis I (instructor for a business calculus course)
  - Spring 2014 (2 sections, evaluations 5.0 and 4.7 out of 5)
  - Spring 2013 (2 sections, evaluations 4.4 and 4.1 out of 5)
- Student Colloquium (seminar founder and organizer), Fall 2011, Spring 2012

Charles University, Czech Republic

- Quadratic Forms (lecture), Fall 2015
- Class Field Theory (lecture), Spring 2011, 2016
- Number Theory Seminar (seminar founder and organizer), Fall 2015, Spring 2016
- Number Theory and RSA (lecture), Spring 2009
- Number Theory and RSA (recitation), Spring 2006, 2007, 2008, 2009
- Number Theory Proseminar (recitation), Spring 2007, 2008
- Abstract Algebra (recitation), Spring 2009
- Fundamentals of Abstract Algebra (recitation), Fall 2007

3. Students advised

Master's

- Kristýna Zemková, *Bhargava composition and classification of rings of small rank* (expected 2018)
- Dominik Lachman, *Bruhat-Tits buildings* (expected 2017)
- Adam Stejskal, *Asymptotic behavior of prime ideals and Galois groups of number fields* (expected 2017)
- Jakub Hlavnička, *Products of primes in arithmetic sequences and prime number theorem*, Czech Technical University, Research Project (2015) and Master's Thesis (2016)
- Maroš Hrnčiar, *Solving diophantine equations by factorization in number fields* (2015)

Bachelor's

- Martin Čech, *Algebraic proofs of Dirichlet's theorem on arithmetic progressions* (2016)
- Josef Svoboda, *Universal quadratic forms over number fields* (2016)

(all students at Charles University, Department of Algebra, unless stated otherwise)