My Teaching Experience

One of the main reasons why I have chosen to associate my life with mathematics is teaching. In school and university, I have met people with various teaching skills and capabilities. Some of them were fantastic teachers, extremely good at lecturing and motivating students to do their best. Other people I met impressed me by the depth of their knowledge on the subject or the unique philosophic insights into mathematics. I have also met people who gave me a personal example of developing problem solving skills and determination which are the corner stones to become a professional mathematician.

I started my teaching while I was an undergraduate student in 2005. I was hired to assist in teaching *Business Calculus with Extended Practice* at the ISM University of Management and Economics. This was a very valuable and eye opening experience. I had to work with students who received different levels of mathematical education at school. I had to rethink every aspect of mathematics that I taught: the key concepts that need to bee emphasized, the most efficient and attractive ways I can deliver the course material, the examples which should illustrate the applications of mathematics in real life. I found that I need to select problems for practice sessions in a careful way to highlight the main mathematical ideas and not to overwhelm my students with impassable technical difficulties. The results of my work met the high requirements of the ISM University and I was assigned to lecture *Discrete Mathematics for Business students* on my full responsibility in 2007.

From 2008 to 2012 I have been working as an Assistant in the Faculty of Mathematics and Informatics at the University of Vilnius. The Assistant's position in Lithuanian universities is an equivalent of a Teaching Assistant. The key distinction is that an Assistant is expected to be more independent from the lecturing Professor and might be fully responsible for organizing, preparing all the problem sets and instructing in practice sessions, as well as assigning homework problems. Before this, I was a Laboratory Assistant at Vilnius University from 2005 to 2008 (an equivalent of Undergraduate Teaching Assistant, responsible for grading homework and exam papers). My responsibilities included teaching first year *Algebra and Geometry* (*Algebra-I* and *-II*), second year *Linear Algebra* (*Algebra-III*) courses, *Functional Analysis* for the fourth year undergraduate students in Mathematics and Applications of Mathematics. In addition to this, I taught Discrete Mathematics for undergraduate students in Information Technology and introductory Calculus and Linear Algebra course (*Higher Mathematics*) for undergraduates in various programs in Physics for the Faculty of Physics of Vilnius University. As a Master and Graduate student, I also have attended and lectured in seminars on advanced topics like Group Theory, Field and Galois Theory, Algebraic Number Theory, Elliptic Curves.

After a successful thesis defense I received an invitation for the post–doctoral fellowship at Simon Fraser University in Burnaby, British Columbia, Canada. This was an excellent opportunity to familiarize myself with academic teaching in American

universities. In 2013 I taught Math 152 *Calculus-II for Sciences* course for Spring and Summer terms at SFU campuses in Surrey and Burnaby (Greater Vancouver area). For my first course I was mentored by a very experienced lecturer, dr. Natalya Kouzniak. I learned how to prepare my notes for inexperienced first-year students, how to make the greatest possible use of the technology (document cameras and tablets) available at lecture rooms and I greatly improved my English. This was the first time I was teaching very large classes (up to 215 students), so I had to improve my communication skills and to use a healthy amount of humor to keep my students focused on the topic.

In 2014 I moved to Waterloo, Ontario for a two year postdoctoral appointment at the department of Pure Mathematics, University of Waterloo. I taught Math 128 *Calculus-II for Science students* in Winter and Math 115 *Linear Algebra for Engineering* in Fall 2014. I was working as a part of a large team of lecturers, coordinated by the most experienced colleagues. The courses were very intense and demanding a careful preparation from the lecturers. Due to my good performance and favorable reviews from students I was assigned to teach two Math 215 *Linear Algebra for Electrical and Computer Engineers* as **a course coordinator** for Winter and Fall 2015.

Because of the range of different topics that I have encountered during my previous teaching assignments, I am fully qualified to do teaching and instructing on the problem solving in Calculus, Real and Complex Analysis, Functional Analysis, Linear algebra, Abstract Algebra, Discrete Mathematics (including Combinatorics, Graph theory, Linear programming). I am able to work under the supervision of the professor or I can prepare all the course syllabus, course notes and homework assignments on my own if such a need arises. In addition to this, I can do teaching on more advanced and sophisticated topics like *Algebraic and Analytic number theory* or *Algebraic Geometry* (on the introductory level), provided reasonable time for the preparation and a guidance of a senior member of the Faculty. I have the necessary experience to work as a course coordinator preparing the course materials, assigning the duties to Teaching Assistants and managing the work of other lecturers.

My Teaching Vision and Goals

My teaching of mathematics has two main objectives of equal importance. The first one is to provide the basic mathematical knowledge and skills for the students which will serve as the foundation for their entire studies and their academic carriers or doing business outside the university. This includes the development of the mathematical tool box and the ability to apply these tools in solving mathematical problems. The second goal of my teaching is to develop the determination and self confidence of my students to overcome unexpected obstacles in nonstandard situations.

For me, the key step to successful teaching is to make myself interested in the things I teach. I like to solve interesting mathematical puzzles or finding new applications

for the theorems that I write on the board for my students. This makes me feel enthusiastic and helps to attract the attention of my students. In order to be self confident and prepared to answer all the questions, I feel that good knowledge on the subject is *a must* for a good lecturer. Of equal importance are the sharp problem solving skills. To achieve this, I always take my time to prepare for the lectures and practice sessions.

I start my classes with attractive motivating examples and explain why the subject we are studying is important. I believe that my lectures must be well structured. The topic of my lecture should always correspond to the mathematical proficiency and skills of my students. After stating a theorem which sometimes can be technical and not easy to grasp, I always try to develop some intuition behind the formal arguments. I believe that highlighting the main idea of the proof takes priority over the pure formality. Thus, I try to use geometrical sketches or graphs whenever it is possible, even if it takes some time. Keeping things simple and intuitive is especially important while working with the first and second year undergraduate students. However, at later stages it is necessary to develop the ability to write a rigorous mathematical proof. On more than a couple of occasions I found out that even among the third or fourth year undergraduates there were students who had difficulties in writing out formal mathematical proofs. In such cases I focused on the proof writing and noticed that exam results improved considerably.

Communication between a teacher and his student is the basis of any teaching activities. For me it is also a very rewarding experience to see interest and enthusiasm in the eyes of my students. I always like to know what their needs are, what they like or dislike, what things I need to emphasize or skip through because my students are able to work it out by themselves. Working with well prepared and mathematically gifted students is especially challenging. I found out that more challenging advanced problem sets for talented students help to keep them interested in the subject. If there are several high level students in my class, this strategy is useful to create a healthy competitive environment. As for my grading policy, I feel that it should be balanced and must reflect the level of mathematical preparation of the whole group of students I am teaching.

In conclusion, I think that teaching is a very important part of my academic carrier. It is also a continuous process of self improvement which constantly makes me rethink all basic concepts and reconsider the very foundations of mathematics. I would like to express my sincere interest to teach various courses in the accepting University. I am always open for the discussion with senior members of the Faculty to meet the highest standards in my teaching.