# Teaching Statement

***I. A. Bogaevskii***

## 1 My teaching positions

Now I am a Professor at the Faculty of Mechanics and Mathematics of Lomonosov Moscow State University. It is one of the biggest universities in Russia internationally recognised in Mathematics. I started working there 16 years ago.

Besides, during my career I had two permanent teaching positions and two temporary ones.

My previous permanent teaching position was at Independent University of Moscow. This is a small mathematical university in the centre of the city. Before that I taught Mathematics at Moscow State Forestry University.

Also I was an invited professor at a joint Bachelor program of Higher School of Economics and New Economic School. These are leading educational institutions in Russia specialising in Economics.

And I read two mathematical courses at The University of Liverpool during one semester of 2008.

**Teaching positions:**

- Faculty of Mechanics and Mathematics, Lomonosov Moscow State University, Russia

  Professor: 2019–present

  Associate Professor (Docent): 2006–2019

- Independent University of Moscow, Russia

  Associate Professor (Docent): 1998–2009

- Moscow State Forestry University, Russia

  Associate Professor (Docent): 1993–1995

- Higher School of Economics & New Economic School, Moscow, Russia

  Invited Professor: 2014

- The University of Liverpool, UK

  Visiting Lecturer: 2008

## 2 My courses

The courses which I taught can be divided in two big groups. The first one is "Compulsory courses of the standard level". The second group is "Special Courses of advanced level chosen by students". My duties included lectures, seminars, exams, and grading.

I have experience in teaching and developing mathematical courses of all levels, from introductory to advanced.

For example, I taught students not majoring in Mathematics at Moscow Forestry University, developed and read a general course "Catastrophe Theory in Applications" for students of all faculties of Lomonosov Moscow State University.

On the other hand, I participated in design and development of the curriculum of a brand new Lomonosov Moscow State University Programme "Fundamental Mathematics and Mathematical Physics" aimed at advanced students. The Programme was designed with support of Theoretical Physics and Mathematics Advancement Foundation "BASIS" and is implemented in cooperation with Institute for Theoretical and Mathematical Physics (ITMP) of Lomonosov Moscow State University. In cooperation with a colleague I developed a new course "Dynamical Systems" for undergraduate students for the Programme. Along the same lines, we designed a "Theory of Dynamical Systems" course for Geometry and Quantum Fields Master's program (joint program of Lomonosov Moscow State University and ITMP).

**Selected courses:**

- Compulsory courses (standard level):
  - *Ordinary Differential Equations*
  - Calculus
  - Functions of Complex Variable
  - Discrete Mathematics
  - *Topology*
- Special courses (advanced level):
  - *Singularity Theory and Its Applications*
  - *Mathematical Catastrophe Theory*
  - Calculus on Manifolds

- *Topology II*
- *Characteristic Classes*
- Representations of Finite Groups
- *Optimal Control and Optimisation*

The courses in italic are developed by myself.

## 3 Teaching in English

During several years I participated in the "Math in Moscow" program organised by the Independent University of Moscow for foreign students. Also I taught two courses during one semester at the University of Liverpool.

**Courses in English:**

- Program "Math in Moscow", Independent University of Moscow, http://www.mccme.ru/mathinmoscow/:
  - *Topology II*, 2003–2005, 2007, 2009
  - *Mathematical Catastrophe Theory*, 2004
  - Calculus on Manifolds, 2005–2006
- The University of Liverpool:
  - Discrete Mathematics II, 2008
  - Representations of Finite Groups, 2008

The courses in italic are developed by myself.

## 4 Teaching vision

Mathematics is a fundamental science which is a basis of a holistic approach to nature and a useful tool, and my aim is to teach my students both. During lectures I present key concepts, develop a sense of beauty of Mathematics, show the interconnections between Maths and Physics or between different areas of Maths. At my seminars we concentrate on solving standard problems, but making students grasp broader issues as they sharpen their technical skills.

My approach is to help students master difficult topics by understanding the inner logic of the subject (in particular, I like to give geometrical interpretation of algebraic concepts). Also, my rule is to maintain balance between helping student through difficult problems and encouraging their independent work.

I support the idea of integrating research and teaching, and include some of my essential scientific results on Singularity Theory and its applications into the programs of my special courses "Mathematical Catastrophe Theory", "Introduction to Singularity Theory", "Critical points of smooth functions", "Lagrangian and Legendrian singularities" taught at the Lomonosov Moscow State University. I always encourage students to conduct their own research, participate in research seminars and present their scientific results at conferences. Currently I supervise two students conducting research in on singularities in sub-Riemannian geometry.

I help students to succeed by providing consultations, review sessions and feedback on their course work. I am available by e-mail and if necessary meet with students online or in person. I constantly work on further improving my teaching and adjust it to a particular group of students. Needless to say that I am dedicated to principles of equality, diversity and inclusion. I always make sure to provide equal and fair treatment and opportunities to all students.

I believe I have effective and agile communication skills. For example, due to the pandemic I had to quickly realign my course "Ordinary Differential Equations" to online format in spring semester 2020. As a lecturer I was responsible for 120 students studying in 6 groups. I had not only to swiftly transform my own lectures, but also to redesign the system of collaboration between professors conducting seminars, students and myself. Besides, I started to consult students more often than before the pandemic. As a result the quality of teaching was not affected and at the end of the semester I received a letter from my students containing gratitude for great support during the pandemic.