

Teaching Statement

Manuela Girotti

Teaching Mathematics requires care and dedication. Mathematics is often perceived as very abstract to students, especially first-year students, while other fields have direct applications and evidences in everyday life and therefore it is easier to relate with them. Given such prejudice, a “bad Math teacher” can furthermore discourage many students and it is hard to give them back the confidence to learn and understand Mathematics.

My primary goal as a teacher is to create a motivating environment for the students: show enthusiasm when teaching, instill interest in the topics, engage students in class discussions and make them feel safe to ask questions.

A maieutic methodology based on dialogues and argumentations is the inspiration for my teaching. I often use the method of think-alouds, while explaining new theories or solving new problems, and I invite the students to give their opinions and formulate a logical concatenation of evidences that will lead to the right answer.

In this way, students will be able to develop a mathematical intuition, instead of blindly applying formulæ, and they will acquire a strong analytical skills that can be successfully used in areas within Mathematics and beyond that. Examples and pictures can show them the way to abstraction and theorization. Sometimes I challenge the students by suggesting them a set of tools, that have been explained earlier, and inviting them to think about how to use them in order to solve a new problem.

A good teacher should be dedicated, patient and knowledgable. I make every effort to empathize with the students’ struggles and success to understand new concepts.

Daily re-looping of previously learned material is greatly appreciated by students, so that they have a basic background to start with, and it is an effective way to gather their attention before tackling new topics. Additionally, when a considerable portion of the program has been covered, I take a brief moment to reflect with the students upon what has been seen so far and where the class is heading to, so that the learned structures are constantly reinforced.

Attendance and attention are crucial in learning Mathematics. While I am teaching in class, I refer to the textbook with clarity, but I explain the passages and the arguments in more details, so that the time spend in class is for the students a valuable time, worth investing in. On the other hand, I regularly stress that textbooks are extremely valuable in the review process that students should undergo after class.

While explaining new theories and theorems, I face my students and pay careful attention to adjust my speech (change in speech patterns, paraphrasing, etc.) in order to increase the students’ comprehension. Only later, I write on the board the key ideas, using specific and more formal words. This will help them to develop a solid Mathematical vocabulary which they will be able to use in writing homeworks in a clear and structured way, and it will be beneficial in strengthening their (technical) communication skills.

After illustrating the theory, I implement it with some exercises. My goal is to solve at least two exercises, with the active participation of the students: an easy and straightforward application and a more challenging one. In doing so, students will be able to explore all the possible ways to solve the problem using recently explained tools; they will analyze the exercise and they will compare the hard problem with the previous easy one, to find some common patterns and get an intuition on the method to follow. I don't borrow the examples from the textbook, but I propose genuinely different and explanatory exercises.

I consider my teaching job to not be over at the end of every class, but to continue outside the classroom. I encourage my students to come to me to expose their doubts and ask for clarifications during office hours, at the end of classes or through email exchanges. I make an extensive use of the online class management system (Moodle for Concordia, Canvas for CSU) by sharing stimulating links, useful mathematics webpages and old versions of midterm and final exams, when available. Whenever possible, I also link the topics covered in class to real word applications and show the possible developments of theorems and techniques.

When a test date is approaching, I usually set up a few hours of exercise sessions outside the class schedule to meet with the students, clarify their doubts and solve problems together, to better prepare them for the exam.

In case of non-coordinated courses, I create a structured and coherent outline of the program that will be covered along the semester and occasionally write my own notes (shared with the students and posted on my website) to complement with the contents of the book.

Easy quizzes or exercise sets on recently viewed topics are handled to the students to be solved in class on a regular basis. The exercise class is set as a flipped class, so that active learning can be directly implemented. It is a useful tool for both the students and myself to understand to which level the concepts are understood. On the other hand, assignments are intentionally created to be more challenging in order to boost students' intuition and discussions among themselves. While grading homeworks and exams, I give constructive feedback and post the solutions with a detailed description on the course webpage.

I strive to give to the students every possible facility to deeply acquire methods and theories so that they can succeed in the course and become fully independent and confident in facing future related problems that they may encounter.

Diversity and Inclusivity Statement

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Being a woman, an international student and a first-generation college student, I experienced and I recognize all the barriers and difficulties that women and other minorities are facing when studying and/or working in science.

I strongly condemn any form of discrimination and bias based on race, ethnicity, sex, gender expression, age, religion, culture, disability and socio-economical status.

As graduate students representative, during my PhD, I put a lot of effort into organizing social and research events in order to foster relationships between the students and to create a friendly community where everyone would find support and feel safe to talk about their problems or share their successes.

One of the main issues that the graduates students were facing was their funding and financial situations (in particular for international students): for many of them it was extremely critic, since Concordia financial support was too low to allow the students to afford both tuitions and basic living expenses. I took a series of actions (including a presentation during the Annual Departmental Meeting and a letter sent to the School of Graduate Studies) in order to raise the awareness on this topic. At the time of my graduation, the situation showed some improvements.

During my first post-doc in Belgium, the Math Department population was highly homogeneous and, to the best of my knowledge, there were resources (nor there was recognition of the lack of them) to encourage and develop inclusivity and integration.

On the other hand, at CSU I've been trying to take part into the many initiatives happening on campus (as much as my schedule would allow), like the Colostate Student Chapter of the Association for Women in Mathematics, the events organized by the Women in Natural Science (WINS) and the International Presidential Fellow Program.

In regard of teaching, I am committed to make my class a safe environment where each student can feel comfortable and accepted. I believe that every person is unique and valuable and they deserves to be treated impartially and with respect. I consider every aspect of my students as a precious asset that can enrich myself and my class and that can stimulate an open and positive dialogue.

I pay close attention to use an inclusive language in my communications and during lectures and I make sure that all my students are granted equal access to educational resources, by informing them about campus facilities that could be useful for their success in the courses and by always giving my availability for help, extra discussion and accommodations in order to resolve issues, conflicts or doubts of any nature.

In the future I would like to take a more active role in furthering diversity and inclusivity. I would be happy to engage in mentoring activities and start a networking and support group for women, minorities and international students.