**Teaching statement**
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I am experienced in organizing and teaching various undergraduate courses in mathematics, including basic courses for freshman and advanced undergraduate courses in specific topics. My common strategies for teaching are supplying concrete examples and helping students build the ability of independent thinking. Even though every student is unique, these common strategies work successfully most of time. In addition, I am always proud and full of joy when my enthusiasm and knowledge help others resolve their confusion and appreciate the beauty of mathematics. Moreover, I have advised students conducting undergraduate research. By means of guiding students to explore unknown areas and attack open problems, our collaboration led to results publishable in good journals. I hope that I can continuously polish my teaching abilities and advising skills and develop as an even better teacher.

The rest of this article includes details of my teaching strategies and experience in teaching lectures and advising students for carrying out research.

I always prepare plenty of examples prior to lectures. In order to precisely state rigorous concepts, many natural mathematical notions are defined in a way that is too formal and abstract to be absorbed by students with less experience in this subject. Therefore, I provide concrete examples to illustrate new concepts. For example, the formal definition of a binary relation between two sets is a subset of the Cartesian product of these two sets. Though it is obvious for people who are experienced in advanced mathematics to see why this notion is defined in this way, students in my class did not think so. So I offered a concrete example, "one integer $x$ is related with an integer $y$ if $x$ divides $y$", and showed how to collect those related pairs of elements. Then students understood why the relation is stated as a subset of the Cartesian product of two sets.

Moreover, I often offer questions in the quizzes or exercises closely related to problems that I taught in the previous lecture so that they can use the skills that they learned to solve problems on their own and increase their confidence for their future studies. A common difficulty of students in learning math is that they do not know how to initiate the solving process when they face a problem. They usually claim that they can follow the sample problems in the textbook or in lectures, but they are not able to solve similar questions on their own. In my experience, this is caused by lack of practice in building up the skill of independent thinking about similar material. Therefore, assigning exercises and quizzes provides opportunities to push them practicing and thinking on their own. For instance, when my students studied the method of changing variables in Calculus, they can follow the lectures and understand the procedure of applying this method. But some of them were not able to solve similar problems on their own as they did not know what variables they should substitute. Through trials and errors when they strive for their assignments, they successfully built up intuitions and acquired the ability of solving those problems on their own.

In class, I like to interact with students through looking at their faces and asking them questions. The faces of students often express if they understand and absorb the material I just taught. It is great whenever I see their confidence. When they are perplexed, sometimes they are able to express their confusion concretely, but sometimes they are ether totally lost and not able to organize their questions or simply too shy to ask. For the former case, everybody in the classroom hears the question so I usually encourage other students to think and try to answer. It not only helps the first student resolve his confusion but also provides an opportunity for others to ponder and convey their ideas so that it benefits everyone in the class. For the latter case, it is not hard to get their confusion from their faces, and I know that it is time to slow down and offer detailed explanations. In this case, I like to give analogies to help them understand and test if they get the key idea. More precisely, I usually guide them to the right track step-by-step so that I can figure out which

part puzzles them, and repeat this process until they can resolve the problem by themselves. For instance, when I taught the use of mathematical induction to prove a problem, I first helped them identify the statement in the question in which they have to prove, then led them to verify the induction base and claim the induction hypothesis, and finally directed them to complete the proof by reducing it to easier subproblems and conquering them separately.

Furthermore, I always encourage students to consult with me during office hours. As the skill levels of students in a large class vary a lot, it is very hard to make everyone in the class satisfied. Some are eager for more knowledge and hope the class can speed up, but others would like a slow pace to make sure they can follow the material. The objective in lectures is to find a suitable pace that meets the needs of the majority of the audience. For those who want to learn more advanced material or those who require more detailed explanation, I encourage them to attend my office hours. During office hours, I can pay much attention to those who need my help and address their queries. I am happy that students usually give me positive responses after they receive my help in my office hours.

In addition to teaching in lectures, I served as the advisor of undergraduate students for their senior thesis. Advising students for conducting research is quite different from teaching in lectures due to their essences. Unlike conveying knowledge in the textbook, it is a process to help students find and solve problems that were not tried by anyone or remain unknown how to be solved. My strategy is to guide them to the accomplishment of the project step-by-step: starting from looking for research problems, building sense and being familiar with related areas, coming up with possible approaches, to completing the writeup of the paper.

When students approached to me for conducting their senior research in graph theory and combinatorics, we had a conversation so that I understood their background, research interests and the types of questions that they like. After this short conversation, I assigned to them some papers about questions and results that fit their flavor and contain some useful tools in related areas. Take the experience of working with a student for example, we targeted on an extremal problem in graph theory and tried to solve it. Inspired by the papers that I assigned to him, we came up with an approach to attack our aim. The student was manageable to overcome several difficulties along the path toward the goal, but it was unsurprised that he got stuck. My role was to discuss with the student, find alternatives for conquering those barriers, and hint and direct him to come up with the ideas in my mind. Finally we had a proof of an open question. The last step was to express the proof rigorously and transform it into a smooth article. This requires practice and experience even for native speakers, because solutions of open problems are usually much more complicated than the exercises that were faced by students and they were not experienced in conveying such technical arguments. I proofread the writeup of the student and pointed out the arguments that were necessary to be improved to complete his senior project. This strategy turns out to be very successful. Our joint work finally led to two results publishable in good journals in graph theory, where one of them have been accepted for publication.

To sum up, teaching mathematics in lectures and advising students for carrying out research are fun but non-trivial tasks due to the nature of abstraction and rigor of math and the difficulty of exploring unknown realms. Providing intuition and concrete examples are common techniques that I use to overcome these barriers, and they have been proved to be successful in most of the situations. Moreover, through interacting with students not only can I get a better picture of their progress of study, but can also offer a chance for some prominent students to organize their ideas to help other students catch up. In addition, accompanying with and guiding students to complete their research projects step-by-step are very helpful and essential for those who have never experienced in conducting research. All in all, in addition to focusing on my own research, I would like to sharpen my teaching and advising abilities and become an even better teacher.