Balliol College Maths: Dr Luciana Basualdo Bonatto – video transcript

The tutor, Dr Luciana Basualdo Bonatto, is seated, facing the camera. The tutor's name and course subject are shown the first time they appear. The tutor answers the questions that are displayed on screen.

>> DR LUCIANA BASUALDO BONATTO (WHITEHEAD LECTURER IN MATHEMATICS): I'm Luciana Basualdo Bonatto. I am a tutor in Maths here at Balliol, I'm the Whitehead Lecturer at Balliol and at the Mathematical Institute. My area of specialty is topology, which is roughly the study of shapes. Sort of inspired by what you do in geometry, but with different techniques that allow you to study shapes – for instance, in higher dimensions.

[Question displayed on screen:]

What qualities do you look to develop in students?

>> DR LUCIANA BASUALDO BONATTO: Some of the main qualities we want to develop in students are the ones that make an independent mathematician. So, there is some scepticism towards proofs that we want them to develop. To look at a proof and think: 'Why does this work, and what are the main parts of it that are making it work?'. And also, to bring the scepticism and rigorousness to their own work, to how they write, to how they present mathematics. This is one of the key things that we want to develop in their first year. But also some general techniques on how you learn a new subject in mathematics by yourself, and how you relate it to the previous ones you've already got, things that we focus a lot on the first year. And, of course, students already have a bit of this from their previous experience, but university mathematics is quite different from school mathematics. So, the most important thing is that they bring their passion for mathematics, how excited they are to work on problem solving, and put enough work in. Because those skills are the ones that are actually going to be developed most during university.

[Question displayed on screen:]

What type of work do you give to students to prepare for a tutorial?

>> DR LUCIANA BASUALDO BONATTO: Students usually prepare for tutorials using a mix of the lectures, the lecture notes. But crucially, tutorials are based on the problem sheets that are set out by the lecture. The heart of the tutorials, students submit the solutions before, I mark them, and really they are the main topic of the tutorial discussion afterwards.

[Question displayed on screen:]

How are the tutorials structured?

>> DR LUCIANA BASUALDO BONATTO: The first year of Balliol has a mix of tutorials and classes, so I'm going to explain this to you separately. So, classes are usually run with around ten students, and it's a bit more of me running it as a tutor and trying to focus on constructing some techniques of studying and habits of being a mathematician that students might not have developed before. So, it will still be around the problem sheets, and we will be discussing problems, but it will be a bit more guided by me. Still with a lot of participation from students – this is by no means intended to be like a lecture. The students are participating in bits and pieces, instead of leading the discussion, which is very much what happens in tutorials.

Tutorials are with two to three students, small groups, and it's really having the students ask their questions, their ideas, their explanations at the centre of it. So I usually start my tutorials with asking what the students want to discuss. It's really important that they bring the questions that they found more challenging during the problem sheets, and they have all the questions already set out so we can have a very productive discussion. Then, usually I have students present their solutions and explain their ideas, so it's way more participative. Really, the students are at the centre of it.

[Question displayed on screen:]

How do you explore ideas with students?

>> DR LUCIANA BASUALDO BONATTO: The way we usually explore ideas with the students during tutorials is really starting off from one of the problems that they had to solve in their problem sheets. We might start by revising 'Okay, what are the key ideas that are building this problem?', and, when revising, you might pick up some questions that were left over; like 'This is the definition, but I didn't really get why we defined it this way or not'. This is a great opportunity that I really enjoy. To explore the ideas further, not only like 'That is what you need to know', but also 'Why was it defined this way, and how does it relate to previous concepts'. So, just this recap on the ideas that are built into the problem sheets is a great starting point for the discussion. And then, the problems themselves, because the idea is not that you will leave the tutorial knowing how to do problem 3 on problem sheet 2, but that you know how to think about problems of that sort. And, that you have the confidence to attack other problems in a similar way. So, we can pick up a question like that, and start building on like 'Okay, what were the ideas that were crucial to study this, or to solve this?'. And this just builds up a very beautiful discussion.

[Question displayed on screen:]

What do you enjoy about your conversations with students?

>> DR LUCIANA BASUALDO BONATTO: I always really enjoy conversations with students. I think the tutorials give a very friendly setting for a mathematical conversation that allows them to maybe give rise and voice to some more creative parts that are not only like 'Okay, this is the definition, and this is my solution' but 'Why is this the definition, how does it relate to the other parts of the subject that we're trying to understand?'. I love these questions; I love to see my students explore this more creative side of mathematics and also see them becoming more and more rigorous in what they're learning. Like 'Why was this the best choice, why was this the best definition?'. I think this leads to amazing discussions, and to a much deeper understanding of the subject.

[Question displayed on screen:]

How do your students help to inform your own research and understanding of your subject?

>> DR LUCIANA BASUALDO BONATTO: The discussions with my students always reshape and improve my understanding of the subject itself, just because I'm always trying to help them build bridges to their own intuition or their own background. This comes in very different forms. When I have a different student, and we're having a different conversation, this always challenges me to look at the subject in a different way or explore a completely different approach to solving one of the problems. This just leads me to have a very broad understanding of the subject that we're discussing.

[Question displayed on screen:]

What is the best thing about teaching at Balliol?

>> DR LUCIANA BASUALDO BONATTO: The best thing about teaching at Balliol is the students, and the amount of time we get to spend with them. They are always very excited, creative, motivated, and I'm lucky that we have the space and the time to really build on that creativity together and explore the problems and the subjects very deeply.

[Final page:]

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