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Teaching Statement

I have been teaching mathematics courses since 2008, when I began teaching as an instructor. I have had the opportunity to teach a number of courses, although mainly in applied mathematics – including, in 2022, Numerical Analysis at Constructor University. I enjoy teaching, both for the joy of sharing mathematics, but also for the opportunity to revisit some familiar material and enhance my own understanding.

I have experience of teaching to broad, diverse international audiences. Recently I was invited to deliver a series of lectures to a number of graduate and post-graduates as part of a CIMPA summer school on mathematics in medicine, in Havana. Furthermore, while a post-doctoral researcher at University College London, I also taught mathematics for students in the foundation year program at Nazarbayev University, in Astana, Kazakhstan for three months.

A key feature of interdisciplinary work is the ability to communicate mathematical challenges to a non-specialist audience, and I believe my research experience has enabled me to develop this skill. This skill is an asset for teaching as it encourages concepts to be delivered in accessible language. Furthermore, applied mathematics is a foundational skill for scientists and, as such, is taught to students studying a variety of disciplines.

I have experience of providing supervision to undergraduate, masters and PhD students. Another feature of my research has been to develop sustainable, deployable, robust numerical tools for solving complex physical systems. Consequently, I have experience in many of the modern research tools which an applied mathematician may require, such as version control, unit testing, continuous integration, documentation etc. These are tools which can empower post-graduate students to be more productive, and I have encourage and supported students to embrace these.

I am confident in my ability to teach a variety of undergraduate courses, specifically in areas of applied mathematics such as dynamical systems, ordinary and partial differential equations and numerical methods and analysis. I believe I have been an effective a teacher, as evidenced by positive student evaluations as well as many unsolicited compliments I've received from students. As mentioned, I enjoy sharing a subject which interests me, and believe that this should not be confined to the lecture theatre. Where possible, I have been involved in outreach events, as I believe that there should be no barriers to studying mathematics.

During my first week as an undergraduate, a document was distributed called learning to learn, and it featured the quote by George Pólya, "Maths is not a spectator sport". To me this means being active and participating in the act of thinking mathematically about a given problem. To foster an environment to enable this approach, I try to adopt an open and non-judgemental manner, and encourage students to ask any questions they want about the course content. Especially in the beginning of courses, I emphasize that no question is a "stupid question". I believe that continuing to ask questions may help re-frame concepts and lead to a better understanding of mathematical ideas.

I understand that there are many approaches to learning and I have provided printed and online materials as well as coded examples in order to cater for as many learning preferences as possible.

Applied mathematics has undergone significant changes in the past decade, primarily through advances in machine learning, and the broad range of applications touching many areas. As such I believe that course content should reflect this, so that graduates from Constructor University are equipped with the tools and understanding to thrive.