

# Dr. rer. nat. Martin Bies

## *Teaching Statement*



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German	<b>Native</b>	●●●●●
English	<b>Full Proficiency</b>	●●●●●
French	<b>Modest (CEFR Level B1)</b>	●●●●●

My teaching approach, shaped by years of research in Mathematics and Physics, is centered on delivering comprehensive education, fostering understanding, and providing valuable resources. I am committed to enhancing the learning experience and supporting students in their academic journey.

## MOTIVATION

I am driven by the desire to provide students with a comprehensive and satisfying educational experience. My motivation stems from my own frustration as student with incomplete explanations and instructions. Consequently, I aim to deliver clear and rigorous instruction, distinguishing between assumptions and logical deductions.

## COURSE DESIGN

In today's information-rich environment, I emphasize the need to clarify the purpose and relevance of each curriculum topic. In my *Math 313/513* course at the University of Pennsylvania, I crafted the curriculum to equip students with essential linear algebra skills, particularly relevant in fields like data science and computer science. To enhance engagement, I incorporate Python programming to demonstrate real-world applications, ensuring that theory is closely tied to practice.

## ASSESSMENT

In my opinion, effective assessment is vital for student growth. I establish clear grading criteria. For *Math 313/513*, I employed a mix of weekly assignments, midterms, and a final exam. All of this is closely coordinated with graders, so as to incorporate their consistent and constructive feedback. I prioritize points for correct answers over penalties for mistakes.

## STRUCTURE OF LECTURES

Recognizing the limited attention span of students, I structure my lectures to maximize engagement. I begin with a brief recap of previous content and outline the day's objectives. Throughout the lecture, I incorporate short breaks to allow students to absorb information and ask questions. These breaks promote active participation and help maintain focus.

## TEACHING MATERIALS

I offer comprehensive resources, in order to create a shared reference point for students, graders and instructors. For *Math 313/513*, I wrote lecture notes, offered solutions to the weekly assignments and made lecture recordings available to the students.

## WEEKLY EXERCISES

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I believe in the power of discovery-based learning. Whenever possible, I encourage students to uncover mathematical concepts through hands-on exercises. For example, in *Math 313/513*, students explored Markov matrices with Python. This approach not only enhances the students' computational skills but also deepens their conceptual understanding.

## INTEGRATION AND DIVERSITY

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Timely feedback is essential for improvement. To gather valuable input, I implement mid-semester surveys and quizzes to gauge student satisfaction and identify areas for enhancement. Additionally, I maintain an open-door policy, offering flexible office hours and support to students, especially those facing challenges, such as during the COVID-19 pandemic.

I strongly believe that diversity enriches the learning experience. I am dedicated to supporting all students, regardless of their background or personal circumstances, and I actively embrace diversity in my classroom. I do not discriminate on any basis and am committed to providing equal opportunities for all students. My goal is to ensure that every student feels respected, supported, and encouraged to achieve their full potential in an inclusive academic setting.