

# STATEMENT OF TEACHING PHILOSOPHY

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Mathematics is elegant, powerful, and often surprising, and I have always loved doing mathematics. Being as an instructor for several years, I realized that I also loved teaching mathematics. Since I was a undergraduate student, I have been fortunate to learn from many gifted teachers, so I took them as models in developing **my own teaching philosophy**. They all had one thing in common: they were able to *(i) explain all the topics clearly and easily, and all the concepts precisely*, while at the same time *(ii) engaging their students and creating excitement for the subject*. In addition, I also *(iii) pay special attention to the diversity, equality and inclusion of the teaching*. The implementation of my teaching philosophy is manifested in the following aspects.

First, teaching should involve a carefully design of the lecture structure including guided discovery. I generally begin a class by reminding the students of something they have seen in the past, and then develop the new topic based on their previous knowledge. Because it is essential that the students grapple with each concept on their own, I almost always have a period during class for discussion or practice. I try to close each class period by indicating how the material will progress.

Second, making use of group learning and giving students feedback in time to get students involved in class. Students may not have enough background knowledge on every topic, so I would give weekly or biweekly group project section, which starts with a short lecture or introduction, and finishes by breaking the students out into groups to work problems together under my supervision. Generally, group work creates a welcome atmosphere for students to learn from their peers and give me the opportunity to regularly assess areas in which students have difficulty. A short lecture may start again if they got lost in some questions or concepts, etc. I use these information to prepare upcoming lectures. I will grade and return their group project in the next class, and the timely feedback can help them review what they have learned and motivate them to study with enthusiasm.

Third, some high level courses, such as numerical solution to partial differential equations, will be designed to be modern and multifaceted. For example, incorporating the use of *Matlab*, and *Mathematica/Maple* software and emphasizing the various theoretical and application aspects of the physical subject equations. The courses also give some numerical solutions and the corresponding figures to be understood easily. I think it is advantageous to develop courses that introduce students to contemporary ideas without taking away from the rigor of the Mathematics curriculum.

Fourth, it is very important that the exams and grading are consistent in one's expectations of students. Matching the difficulty of exams to that of homework questions and lecture examples is crucial for the student to feel fairly treated. In the syllabus I lay down on day one the timeline and grading policy. In lecture I explicitly show the students the types of problems they need to

practise. Exams are often the downfall of otherwise competent students, so I provide tactics for study, exam technique and time-management. I design exams that test the basics, but also contain harder material that only an “A” student should be able to solve. I encourage students to dissect exactly what went wrong in quizzes and exams, since this is the surest key to increasing reliability. I am careful to make multiple versions of quizzes if they are to be used in recitation sections at different times, in order to remove the possibility of cheating. I work with my teaching assistants in weekly meetings to get feedback and ensure consistency in grading.

Last, special attention should be paid to the diversity, equality and inclusion of the teaching. At ISU and Wayne State University, I voluntarily assist students with disabilities and special needs, we provided separate examination room for students who need extra time to complete the test, we also offered scribe and reader for students with visual disability. I also mentored new international graduate students during their first year in the graduate program. I always strive to make my students feel welcomed, supported, included and valued by the fellow classmates and by me. I provide students with a comfortable classroom environment, my students are always welcomed to express their opinions, and I appreciate their different ideas every time. I believe students will feel involved during group work, so I ask my students to work in groups and encourage them to share their work with their peers.

All in all, as an educator or an instructor, I will keep learning to improve my teaching ability and teaching skills to aid students in the understanding of mathematics in a way that builds confidence and a thirst for learning. Meanwhile, I will also improve our communicating skills, understand student’s motivation, interest and skills, and adapt the content and pedagogy around them. Moreover, I have a strong will to accommodate a variety of learning styles and strategies in instructional delivery and learning activities, including online and blended learning, flexible teaching methods, and applied learning approaches.

In the end, I want to list some courses that I can teach, but not limit to these.

#### **Undergraduate Courses** (Omit the repeated courses in Graduate level)

- Calculus (Pre, Medium, and Advanced)
- Matrix and linear algebra
- Trigonometry
- Modeling
- Analysis, Complex analysis
- Probability

#### **Graduate Courses**

- Numerical analysis
- PDE and ODE
- Numerical method for PDEs
- Applied analysis
- Finite element method
- Discontinuous Galerkin method
- Finite volume method
- Finite difference method
- Optimization
- Matlab, scientific computing