Teaching

Self-Assessment

One of the reasons I chose to come to BYU was to work and teach in an environment that was concerned about student's spiritual development as well as their intellectual development. In and out of the classroom, I will have opportunities to encourage and help students realize their individual potential. The problem-solving skills that students develop in mathematics courses will benefit them regardless of what they choose to pursue after their studies. Thus, one of my roles as an instructor is to help students recognize how they are developing life skills and character traits as well as learning specific mathematical concepts. Recognizing and encouraging my student's efforts, both successes and failures, will assist them to develop greater confidence and desires to try new and hard things.

One of my strengths in this process is my excitement for the subject material. Mathematics at all levels has an inherent beauty and elegance. I convey this to students through my attitude and approach to the subject. While I feel this is a strength, I also need to learn to demonstrate the elegance of mathematics to students without trivializing their difficulties in understanding and applying the principles, they are learning. I need to ensure that my word choice and demeanor is encouraging to students. I also need to continue to find engaging and interactive ways to present the material I teach.

Long-term Goals:

1. Develop methods to encourage active learning.
2. Be able to communicate difficult concepts in a clear and concise manner.
3. Become a spiritually strengthening and character building teacher and mentor.

Plan to obtain goals

The following concrete steps will assist me in developing the skills necessary to achieve my long-term goals.

1. Create detailed lecture notes that
   - integrate current lectures with previous lectures and
   - include various approaches to gauge understanding as well as encourage active learning.
2. Develop innovative approaches for in-class instruction by
   - talking with experienced instructors about their teaching methods as well as sitting in on their classes and
   - having my classes observed both by experienced faculty members and students working with the Center for Teaching and Learning (SCOT).
3. Encourage students to talk with me outside of class.
4. Have midterm evaluations and implement suggested improvements.

Scholarship

Self-Assessment

My research focuses on the algebraic topology of spaces with non-trivial local topological structure and on the coarse geometry of groups. Studying abelian covers and fibrations that arise from inverse limits of covering spaces will lead to a better understanding of the homological structure of planar topological spaces. In the next few years, I will develop a theory of fibrations and covering spaces for planar Peano continua.

It is an open question to what extend the Tits boundary is a group invariant. Asymptotic cones provide an efficient tool to study Tits boundary due to their quasi-isometry invariance and their close relationship to the Tits boundary. I will continue to develop the study of CAT(0) boundaries through asymptotic cones. The Tits boundary of CAT(0) groups is in general not well understood. I will continue to develop the correspondence between asymptotic cones of CAT(0) groups and their boundaries.

Scholarship, while rewarding, is challenging due to it unstructured nature. It is easy to spend my time in less effective ways that do not produce quantifiable progress. I have a tendency to fixate on a specific problem or method rather than continually developing new ideas, methods, and strategies to build a complete theory. As well, to be more productive, I need to develop my collaborative projects with other experts outside of BYU.

Long-term Goals:

1. Develop a theory of fibrations for planar continua.
2. Study CAT(0) groups via their boundaries and asymptotic cones.
3. Disseminate my research through publication in quality journals and research conferences.

The following plans will provide incremental benchmarks to assist in using my time and efforts effectively to reach my research goals.

Plan for next year to work towards long term goals

1. Write for at least 30 minutes a day.
2. Read research papers for at least 30 minutes daily.
3. Publish two papers per year in Tier I and II journals.
4. Submit one grant proposal per year if not already funded.
5. Attend and participate in conferences through the year.
6. Seek additional collaborators.

Citizenship

Self-Assessment

Serving and being an active member of my department, the university, and the larger research community is another integral aspect to my development as a faculty member at BYU. The mathematics department at BYU has a culture of mutual support and encouragement. I want to continue

to serve and integrate myself into our department so that I can continue this positive culture. This will include serving and participating in both formal and informal departmental assignments. This past year, I helped to develop the exams for the middle and high school state math contest hosted this year by BYU as well as helping to organize a weekly topology seminar.

Another aspect of citizenship is my involvement in the larger mathematical community. As I participate in conferences and referee for scholarly journals, I will define and develop my role in the mathematical community. This past year I refereed for several different journals and organized a conference. As I continue to participate in projects and serve outside of my individual department, I will help to strengthen the mathematical community as a whole.

Long-term Goals:

1. Be an active contributing member of the mathematics department.
2. Effectively mentor graduate and undergraduate students (at least 3 annually).

Plan for next year to work towards long term goals

1. Find quality speakers to participate in the Focus on Math seminar series for the 2017 Fall semester and the 2018 Winter semester.
2. Coordinate our departments participation in the college Student Research Conference.
3. Assist in the organizing a special year in topology at BYU.
4. Referee for research journals and review articles for Math Reviews.
5. Collaborate with at least two coauthors on projects.

Signatures

Michael Dorff
Chair, Mathematics Department

Curtis Kent
Assistant Professor of Mathematics