

Chapter 8: Undergraduate Discipline Spotlight

The Department of Mathematics collects a variety data each year, both quantitative and qualitative to assess our major. The department is also in middle of conducting its Five Year Review and has mined sources of university data for deeper insights.

The primary tool for assessing how well students have mastered the core of the mathematical curriculum is the Major Fields Test, which all graduating seniors are required to take. We track the fraction of our students that score above the 80th percentile and the fraction that score above the 50th percentile. Both of those numbers had been on the decline, and it was noted as a concern in our previous Five Year Review. Around the time of that last review, we converted our Senior Seminar to a Junior Seminar, which allows the opportunity for some amount of review. This was not a possibility previously for students taking Senior Seminar in their last term. During the past three years, our MFT scores have trended upward. Whether or not this was a result of simply changing the seminar is not entirely clear, but it is a trend we will continue to monitor closely.

All graduating math majors are issued an invitation to complete a survey that provides an opportunity to give open ended feedback. Originally this took place as an in person interview, but it is now completed online allowing for anonymity. This activity is not mandatory, but about two thirds of students complete the survey. We learn a lot about how students chose to be math majors. We also hear suggestions for how we could improve things. These can be diverse, but some themes do emerge. A frequent request from students is additional opportunities for applied coursework. The data from this surveys is further supplemented by the letter seniors submit to their portfolio. Many student will choose to comment on their experiences (both good and bad) in these letters.

The number of mathematics graduates has fluctuated greatly in the past few years. Overall there has been a decline, which is certain to continue at least in the next few years as a consequence of the overall downward trend in university enrollment. A partial explanation for the decreasing number of math graduates is the introduction of the statistics major, which some students have likely chosen as an alternative to majoring in math. Several years ago we began tracking migration of students into and out of the major. The data includes which majors the students are coming from or going to or whether they have left the university. As part of our Five Year Review this past year, we collected data to learn more about students migrating in and out of the major. We accessed records of students leaving the major to determine the last math course(s) they took, and for students coming to the major, we noted the math course(s) they were in the term before switching into the major. So we now have a more detailed picture about the juncture at which students make a transition.

Each year we compile a tally of which courses our graduates took during their time at Truman. Some students begin their careers at Truman having completed the calculus sequence. For most, the first math class is Calculus I or II. Occasionally, a student will begin in one of our precalculus courses. While this is rare, it is important to know that it does happen, and so we must be careful never to write off a student who places at the lowest point. This data also tracks our majors' choices of math electives. As the both the number of majors and faculty in the department are currently in decline, this data will help inform decisions about future course offerings.

Many of our graduates go on to careers in education, actuarial science or further study of mathematics, and our curriculum is designed to ensure these students are well prepared. However, a majority of our graduates go in a different direction, with many following a path more closely aligned with a second major. We have begun to track where our students land after Truman, and now have good data for the last eight years. It's not immediately clear which

courses in the major are most useful for these students, but as we consider our future course offerings, appropriate consideration will need to be given to this large chunk of our students.

The calculus sequence consists of three courses that are required in part or entirely by a number of majors on campus in addition to mathematics. Balancing the needs of the range of these majors with what we want for our own majors from these courses is an ongoing challenge. As part of our Five Year Review, we studied grade data by major in these courses from the past ten years. As one might expect, students in some majors perform better than others, and in some cases the success rate can be alarmingly low. The department has made plans to study the calculus sequence next year, and this data will help us to understand how we might better serve some of the majors for whom these courses can be large impediments.