

WEBER STATE UNIVERSITY

2017-2018 PROGRAM REVIEW **EXECUTIVE SUMMARY**

DEPARTMENT OF MATHEMATICS

December, 2017

Introduction

The Mathematics Department is highly motivated to offer the best possible programs and instruction given the resources it has. Faculty work hard at providing quality courses and generally have high standards.

There are three programs (emphases) leading to Bachelor Degrees, BA and BS and a fourth submitted for approval:

- Applied Mathematics

- Mathematics

- Mathematics Teaching

- Computational Statistics and Data Science (BS only, in the approval process)

There are two minors, Mathematics, Mathematics Teaching and an Associate's degree.

There are three required math courses for Elementary Education Majors and a program for the same majors ("Specialists") consisting of four Math Education (MTHE) courses and two math courses. The latter program allows elementary education graduates to extend their math endorsement to grades 7 and 8.

The courses meeting the General Education Quantitative Literacy (QL) requirement are housed in the Mathematics Department. Math, CSME, Dev Math coordinate a large and growing concurrent enrollment program to offer MATH 1010, Intermediate Algebra, MATH 1030 QL, Contemporary Math and Math 1050 QL, College Algebra in our service area, Davis and Weber counties.

Math coordinates with the Developmental Mathematics Program (Dev Math) that oversees courses that serve as prerequisites for QL courses including MATH 1010, Intermediate Algebra.

Math has 16 faculty members that constitute 14.75 FTE faculty. Each of the Dev Math Instructors (about 15) instructs one QL course a semester. Math employs about 18 Adjunct Instructors. The course work of adjunct faculty is equivalent to 10 regular faculty.

The faculty members have a diverse set of mathematical areas that span applied math, regular math, math education, and statistics. But these are far from representing all subfields.

Math education has been very important for a very long time. Currently there are only three faculty clearly working in math education, but others have made effective contributions. Two members are reassigned half time to the Center for Science and Math Education (CSME). The CSME and MATH coordinate efforts to offer courses for in-service teachers including courses for teachers instructing concurrent enrollment courses and courses that help local school teachers, elementary and secondary maintain math endorsements.

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Curriculum

The programs and courses are very similar to others across the US. Program requirements start with calculus. The Mathematics emphasis is more traditional and theoretical. It is recommended to students intending to go to graduate school. The Applied Mathematics emphasis prepares majors to gain employment in industry. The Mathematics Teaching emphasis prepares majors to teach in Utah secondary schools. The courses required for the teaching major are those needed for a graduate to add a math endorsement to their secondary license.

The required upper division courses are offered at least every other year, and most are offered every year. Courses up through Linear Algebra (Math 2270) and Differential Equations (Math 2280) are offered every semester including summer. There are usually two topics courses each semester that are offered as “reading courses” for one to three students. They are taught voluntarily by faculty as part of service or scholarship. Occasionally required courses are also offered as reading courses to enable students to get courses during a semester in which they are not usually offered. This is typically only done if a student needs a course to graduate before it is offered in our regular rotation. Offering upper division courses more often is desirable, and would happen, if there were more faculty and more majors.

Many of our lower division courses are required in other programs. The students in our calculus sequence are majoring in chemistry, computer science, engineering, math, or physics. The other science programs do not require calculus. The college of business offers business calculus and business statistics. We are open to suggestions by others in regards to these courses, but most are very standard across the country.

The courses for each math program have been the result of a thoughtful and ongoing process. We frequently review programs around the country for new ideas and to see that the current curriculum is relevant and close to what other quality institutions are offering. We work with other departments to offer courses that meet their needs. For example, we worked with the electrical engineering department to adjust some of our course content to ensure that their program could meet national certification.

Enrollment

For the last 10 years total enrollment in QL courses has remained flat, averaging 1230 per semester, fall and spring. But these enrollments have shifted from college algebra to contemporary math and intro stats. Over the past five years the enrollments have been increasing in the calculus I, II, III, linear algebra, and differential equations. Five years ago Statistics I (Math 3410, calculus based) was scheduled one time a year. Currently we are scheduling 3 to 4 sections per year. This is due to increasing numbers of engineering and math majors.

Most of our lower division courses are full before the first day, some with long wait lists. To accommodate enrollments we are:

- Searching for larger classrooms,
- Searching for additional adjunct instructors,
- Shifting regular faculty from a QL course to a new section of Calculus I or II,
- Assigning moderately qualified adjuncts to instruct calculus courses,

We are making every effort to accommodate students, but there are likely some who do not get the course they need or are compelled to enroll elsewhere.

Evidence of Effective Instruction

Graduate Exit survey: We continue to request graduate exit surveys from all graduates as a part of the graduation sign-off of majors and minors. These surveys continue to show that the department is doing a good job of preparing our majors for future success. The responses show that the faculty are generally doing a good job in the classroom. The results have been consistent with student evaluations.

Better quality will result if there are more full time faculty members. More faculty in general are needed to keep the class sizes down to a manageable size. The group of core faculty is only large enough to sustain programs.

The Mathematics Department retains and graduates students consistent with its mission. Also, secondary school mathematics teachers are in high demand, so the department is working to make courses available to in-service teachers, as well as potential new teachers. Academic standards and quality are high, and diversity is encouraged.

Academic Advising

Academic advising for mathematics majors and minors is sufficient for their needs. Each major is being assigned a faculty advisor/mentor to give students a well rounded opinion. The chair and assistant chair are the official academic advisors for all mathematics majors and minors. Any student wishing to major or minor in mathematics need only declare this with the chair or assistant chair. Individual programs are planned so students can graduate in a timely manner. Career opportunities are also discussed. Students still need to see the chair to have changes made to their declarations and course of study. The chair also gives advice to students or other advisors on the university quantitative literacy requirement as needed.

Faculty

The Department has 16 faculty, 14.75 FTE since one member is $\frac{3}{4}$ time and two math education faculty are assigned half time in the CSME. Each of the Dev Math Instructors (about 15) instructs one QL course a semester. Currently Math employs about 18 Adjunct Instructors. The course work of adjunct faculty is equivalent to 10 regular faculty. Over the last 5 years Math has employed 26 different people as adjunct instructors (developmental math employs many more). There is a group of regular adjuncts that teach at least one course per semester and several are teaching 2 or more.

Demographic Summary of regular faculty:

Gender: 4 female, 12 male

Rank: 5 Professors, 7 Associate Professors, 4 Assistant Professors

Tenure: 12 tenured, 4 tenure track

Highest Degrees: all have doctorates

Areas of Expertise: algebra, real analysis, combinatorics, linear algebra, differential equations, differential geometry, geometry, math education, matrix theory, statistics, approximation theory.

Years of teaching experience vary from one to over thirty years.

For ongoing review and development, the chair meets with each faculty member once a year as part of an annual faculty review (instructors from Dev Math are reviewed by their program director). Tenure track people are subject to additional reviews for tenure.

The reviews show that faculty are doing a very good job teaching and that standards are appropriate. Styles and methods differ, but all are motivated to do their best. Some are trying to incorporate new methods. A subset of the faculty are very active in research. Reduced course schedules and an increased department travel budget would help to increase scholarly activity. Service is performed as needed, and the Mathematics Department has had representatives on University Committees and on the Faculty Senate.

Adjunct faculty receive very active mentoring during their first year. New adjuncts are required to have an initial meeting with the chair to go over procedures and policies. They are encouraged to email or meet with the chair if they have questions. Their course syllabus, midterms, and finals are reviewed during their first semester and possible their second. There is a yearly required adjunct faculty meeting. Course changes and adjunct policies are reviewed. All adjuncts must submit their graded final exams for review. The chair or the assistant chair reviews their student teaching evaluations. If there are problems there is a meeting with the chair. Over the past ten years there have been three cases where I have "fired" an adjunct instructor. Adjunct instructors should have more mentoring activities and formal reviews but the department does personnel for it.

Program Support

The Mathematics Department is now residing in a new and improved building using up to date offices and classrooms. This is great, but we lost space and the number of classrooms for which we have first scheduling rights was reduced from 13 to 9.

We are well supported with computers and office equipment. There are always funds for additional sections of a course if we can find an instructor and a room.

There are plentiful opportunities to obtain training on administrative policies, computer programs, assessment, data analysis, new initiatives, and much more. In the past two years initiatives to help

students meet the QL requirement have been started. We are happy to say that the administration is willing to work with the department for improvement, but it has been a lot of extra work some of which was done on overload.

Our Administrative Assistant, Debi Larson is very competent and helpful. She helps immensely with administration. She provides very effective signage, is very adept at using computer programs, and supports faculty and chair with data collection and information. She is very helpful with students providing lots of information and answering questions.

Relationships with External Communities

There is strong and growing relationship with local public schools. Faculty in coordination with the CSME are conducting PD workshops and courses for in-service teachers. Some of these relate to the mandate by the Utah legislature to offer concurrent enrollment courses. There is hope that math instruction and student preparation for college will be enhanced. It is noteworthy that several of our adjunct instructors are high schoolteachers.

Relationships with industry and government are more informal. We have formed an advisor board to get advice and feedback about our programs. They keep us informed about how our students fair in the workplace and they let us know of upcoming needs in their companies. Several of our adjunct instructors have quit due to finding local employment. Many of our students are employed locally.

Program Summary

The programs offered by the Mathematics Department have quality, consistency, qualified faculty, and are meeting students' needs. The Mathematics Department has been responsive to prior reviews. Improvements are resulting from careful planning and analysis of the mission statement, student learning outcomes, curriculum, teaching and learning efforts, and academic advising.