

Department Chair's Letter: Mathematics in 2008-09

August 7, 2009

Every eight or nine years, each department at William and Mary goes through a year-long process of program review. This involves collecting mounds of detailed data, nominating a dozen outside reviewers (and the Dean picks two), and writing a report to answer many questions from the Dean's office. In the spring, a group of reviewers from other universities reads our written report and visits the department, and by the end of summer the department must respond to the report that the reviewers submitted to the Dean. Everyone agrees that periodic program reviews are important, and nobody enjoys them.

The academic year 2008-09 was our turn. We were reviewed along with the departments of applied science, computer science, and physics because, in some sense, these departments form an intellectual cluster. The outside review team consisted of nine visitors, two for each department and one review committee chair. We were pleased to find that almost half of the reviewers were really mathematicians, no matter what department they came from.

One of the questions posed by the Dean asked us for a short statement of our departmental goals. We responded:

Our primary departmental goal is to be simultaneously an outstanding undergraduate teaching department and a nationally recognized research department, with undergraduate research as the bridge linking the two. Our secondary goals are to provide the academic core of the Computational Operations Research graduate program; to participate in doctoral supervision through the applied science department when appropriate students can be found; to participate in various interdisciplinary programs linked to undergraduate mathematics; and to cooperate with the School of Education in mathematics education programs of various kinds. Our tertiary mission is to hold leadership positions in our various national professional organizations and in on-campus faculty governance activities.

As you may know, the national mathematical research spectrum has widened considerably over the last twenty years, as new areas of pure and applied mathematics have grown up. Each mathematics department must decide how to balance, for example, its research in pure and applied areas, and which subjects to emphasize within each of those areas. Over the last ten years, our department has added new faculty in mathematical biology, statistics, computational mathematics, and pure mathematics. Our view is that we now have a suitable mix of pure and applied mathematicians. Further, the border between pure and applied mathematics in our department is frequently crossed: many of our pure mathematicians occasionally publish in applied mathematics journals while many of our applied mathematicians publish in pure mathematics journals from time to time. The outside reviewers agreed with our assessment, praised our interdisciplinary work in mathematical biology and mathematical physics, and told the Dean in their report:

[T]he faculty in William and Mary's Mathematics Department are doing excellent research and are recognized nationally and internationally for their scholarship. The research and scholarship is very strong across the faculty as a whole and the reputation of the scholarship is excellent, both in the more established groups and growing in the newer areas. The collaboration between faculty in the Mathematics Department and other departments is good now and appears to be growing among faculty members with interests across disciplinary boundaries. There seems to be more collaboration here than in many other mathematics departments around the country. There is a healthy number of faculty in the Department who consider themselves applied mathematicians and would also be considered to be so in the wider mathematical community. The breadth and strengths of the Department seem appropriate for a department of their size and in the current state of the mathematical sciences nationally.

We are proud of our success in involving undergraduates in mathematical research, and in finding outside grants to support the students' work and conference travel. We have had an NSF-funded summer program in matrix analysis and its applications since the early 1990s, we have NSF grants to foster undergraduate research in mathematical biology and computational mathematics, and we have an honors-thesis program in which ten of our thirty-seven May 2009 graduates participated.

The outside reviewers were particularly impressed by the department's commitment to, and success in, undergraduate research. They used "REU" (which stands for "Research Experiences for Undergraduates") as a generic term for all of this undergraduate research, and they told the Dean:

The Department has a long-standing and nationally recognized REU program, funded by the National Science Foundation. Given the relatively low participation, nationally, of math sciences departments in research by undergraduates, this is a very positive aspect of William and Mary's Department – it shows extraordinary commitment of the faculty to provide this opportunity, especially because, unlike in other sciences, having undergraduate research students in mathematics usually detracts from a faculty member's own research effort rather than contributing to it.

We don't completely agree with the reviewers' last assertion. While it's true that research with an undergraduate usually goes much slower than research with a Ph.D. student or a faculty colleague, over fifty percent of our undergraduate research students end up as co-authors (with their faculty advisers) of refereed articles in our professional journals.

Let me end this section of my annual letter by saying that the outside reviewers' judgment of us was very favorable, and their report will be of great use to me in talking with the Dean about the department's needs and future plans.

Program review was not the only news from our department in 2008-09. There was also student and faculty news. As noted above, we had thirty-seven graduating seniors in May 2009. This is not an all-time high, but is a good number. The number (ten) of undergraduates who wrote honors theses in 2008-09 was an all-time high, both as a raw number and as a percentage of mathematics major graduates. Without a doubt, this growth is due to our NSF-CSUMS grant. The grant is designed to get more computational mathematics into the undergraduate curriculum, and to entice more undergraduates into undergraduate research in computational mathematics. ("Computational mathematics" is a very broadly defined term, and includes a parts of pure mathematics as well as computationally-intensive simulation projects.) Several of our undergraduates received scholarship and travel support from the NASA Space Grant program. The College has an NSF-NOYCE grant intended to assist students who want to teach in high school mathematics and science, and some of our current undergraduates, as well as one of this spring's graduating seniors, won NOYCE support for their studies. We had eight masters graduates from the Computational Operations Research (COR) program that we share with computer science, and one of our former COR students completed his Ph.D. thesis in the applied science department with one of our faculty members as his thesis adviser. In summer 2009, we continued our mathematical education outreach activities, teaching three grant-supported courses for in-service teachers, one on algebra, one on discrete mathematics, and one on a new high school course called "Algebra, Functions, and Data Analysis" that the Virginia State Board of Education is trying to introduce into the high school curriculum.

Four new tenure-track assistant professors joined the department in the fall of 2008, bringing our total to twenty, and we had a visitor (replacing someone on leave) who worked with our mathematical biology group. Of the eight new faculty whom we have hired over the last four years, half already have external grant support, and that is a major accomplishment. The university continues to recognize the accomplishments of our senior faculty. Professor Larry Leemis was named to an endowed position called "University Professor for Teaching Excellence," and Professors Chi-Kwong Li and Leiba Rodman were among the first ten faculty chosen as "Plumeri Fellows" in recognition of scholarly accomplishment.

As you must have heard, budget cuts have hit us very hard. In 2008-09 we lost 8% of our departmental operating funds. In 2009-10 we have already had a further 5% cut, with the possibility of yet another 5% cut later this fall. We are making cuts where we can (e.g., no faculty travel from department funds, and class handouts to be posted electronically rather than xeroxed), and we are dipping into private funds to help us do what we must. "Private funds" refers to donations that we have received from alumni and other donors, and if you are able to help us, we would be most grateful. You can find an easy way to send us your donations by going to our (new) departmental home page

<http://www.wm.edu/as/mathematics/?svr=web>

where you will see a menu item called "Support Mathematics." I hope that you will do so.

Sincerely,
David Lutzer, Chair, Mathematics Department