

5a. Quality of teaching and learning in the mathematics department

December 5, 2008

Classroom teaching quality: The mathematics department uses four approaches to monitoring teaching quality. The first is student evaluation forms which are administered in every mathematics course taught. The second is annual peer visitations to classes in which members of the elected department Merit Review Committee visit every mathematics class each fall, and the department chair makes separate visits to the classes of non-tenured faculty each semester. The third is student nominations to identify recipients of the annual Simon Prize for Teaching Excellence. The fourth is senior exit surveys completed by our graduates each spring.

Interpreting the data from the student evaluation of teaching forms presents some challenges. For example, in 1995, a department study noted that there were always marked differences between student responses on the “overall effectiveness of teaching” question in different types of mathematics courses. Therefore the department began a process of using historical comparison data for classes of different types. For example, a student response average of 4.2 (out of 5, with 5 being best) would be very good in a Calculus I course, but only about average in a Math 214 course.

This historical information allows the Merit Review Committee and our Personnel Committee to compare apples with apples when they must interpret student responses to teaching, i.e., to compare teaching evaluation averages from this semester’s Calculus I classes with historical figures from Calculus I classes, rather than comparing Calculus I classes with some department-wide average that conflates student responses to freshman and senior-level classes. The comparison data is collected and updated every semester. A copy of a recent report to the department is the second page of this subsection.

In addition to using course evaluation numbers, the Merit Committee discusses students’ written comments that appear on the back of the teaching evaluation forms. These are often rather sparse, but when meaningful they are considered.

In addition, our Merit Review committees visit all fall-semester courses and use the resulting class visitation reports as an integral part of their discussions of teaching quality. (The department chair conducts class visitations of junior faculty members’ classes that are separate from the Merit Committee visitations mentioned above. Based on these separate visitations, the chair meets with junior faculty to discuss his observations of their teaching each semester.)

Each spring, a committee of students and faculty meets to discuss nominations for the Simon Teaching Excellence award. These nominations come from students and emphasize both lower-division teaching and teaching in courses for majors.

Teaching via undergraduate research: Undergraduate research supervision is a valued part of teaching mathematics at William and Mary and is an integral part of our Merit Review and promotion and tenure decisions. Typically about 20% of our majors write honors theses. Others participate in our summer REU programs. Starting in spring 2008, still other students have begun long-term involvement in our NSF-CSUMS project (designed to interest mathematics majors in the broadly defined area of computational mathematics, and to get them working on undergraduate research projects early in their studies). All of these REU efforts are considered by departmental committees when recommending salary raises and in promotion and tenure considerations. One measure of the quality of undergraduate research supervision in the department is the number of undergraduate honors theses that turn into refereed journal publications. (A list is available on the department’s website.) Another measure of quality is the fact that we receive repeated national grants to support undergraduate research at the College (NSF Summer Site grants, NSF-UBM, and NSF-CSUMS).

Teaching effectiveness of the COR Master's program

One way to measure the educational effectiveness of the COR masters program is to compare the number of students admitted to the COR program in year N with the number who graduated no later than year $N + 2$. That is the goal of the next table, which also appeared in section 4b.2.

COR Program Effectiveness: Two-Year Graduation Rate of Full-Time Students

Entering COR class of year $N =$	99	00	01	02	03	04	05	06	07	08
Number admitted in year N	9	6	4	6	7	7	7	8	6	8
Number graduating by year $N + 2$	9	6	4	5	6	7	7	8	NA	NA

Awards in recognition of department teaching quality:

The Simon Prize is an annual teaching award for outstanding mathematics teaching that was endowed in 2002 by two 1960s graduates of the department. Previous winners are Professors D. Johnson, Leemis, Bolotnikov, Schreiber, Lewis, D. Johnson and Loehr, and Li. Although the Simon prize is restricted to mathematics department faculty, we mention it because nominations all come from students, and undergraduate students are the majority of the selection committee.

There are also awards for teaching that are external to the department. From time to time, the administration announces competitions for faculty awards of various kinds. Consistent with William and Mary's emphasis on teaching, all of the awards require departments to document the outstanding teaching record of nominees, and our department has a very strong record of winning these awards. Here are some examples from the last several years:

Larry Leemis, 2008: University Teaching Chaired Professorship

Michael Lewis 2008: Distinguished Associate Professor award

Vladimir Bolotnikov, 2007, Distinguished Associate Professor award, plus the College's Jefferson Teaching Award, the highest teaching award for junior members of the faculty.

John Drew, 2003, the Thomas Graves Lifetime Teaching Award, the highest teaching honor that the College can award.

In addition to university-wide awards, the College makes annual nominations to a state-wide program called "Virginia Outstanding Faculty Awards" (VOFA). Each year about a dozen VOFA awards are given state-wide and teaching excellence is a key component of the VOFA awards. Past winners of this award from our department are Professors C. Johnson (2001) , Li (2004), and Lutzer (2006). Since the VOFA awards were begun in the mid-1980s, the William and Mary mathematics department has won more of the VOFA awards than all other mathematics departments in the state, combined.

*****HISTORICAL DATA ON TEACHING IN MATHEMATICS COURSES*****

INTERDEPARTMENTAL COMMUNICATION

The College Of William & Mary

To: Faculty, Mathematics Department

From: David Lutzer

Date: January 3, 2008

Re: Interpretation of teaching scores from Fall 2007

Some years ago, the Personnel Committee asked me to write to department members periodically about departmental teaching evaluations. The numbers below give historical data about student responses to the "overall teaching effectiveness" question on our teaching evaluation forms. They should help to interpret individual section averages on an almost course-by-course basis, an approach that gives more information than merely a comparison to a department-wide average for the current term. The figures in the table are averages of section mean scores.

In this report, I have put Math 111 and 131 together as Calculus I, and I put Math 112 and 132 together in a single Calculus II category. Math 212 and 213 are a combined Calculus III category. In addition:

a) Starting with the fall semester of 2002, I have not included any sections with fewer than three students when computing course averages.

b) In a course where a single lecture section of 35 students is broken into two subsections because of computer lab space constraints, I have combined the subsections' teaching scores to get an overall score for the class. For example, if the average from subsection 1 (with 18 students) was 4.7 and the average from subsection 2 (with 17 students) was 4.5, I computed the overall average for that 35 student lecture section as $(18*4.7 + 17*4.5)/(18+17) = 4.60$.

Courses	# of sections	historical avg.	Fall 2007 avg.
Math 104 ^b	60	4.04	4.42
Math 106 ^b	58	3.88	4.08
Math 108 ^c	19	4.31	(a)
Math 111 & 131 ^d	248	3.69	3.94
Math 112 & 132 ^d	196	3.85	(a)
Math 150 ^e	13	4.26	(a)
Math 211 ^d	101	3.70	3.67
Math 212 & 213 ^d	78	3.84	(a)
Math 214 ^d	39	4.28	(a)
Math 300-499 ^d	416	4.14	4.12

Notes on Table

(a) In the just-completed term, there were too few sections of the course to publish an average while still maintaining confidentiality.

(b) starting Fall 1997. (c) starting Fall 1998. (d) starting Spring 1991. (e) starting Spring 2000.