Progress Report of Cycle Five MOA

Department of Mathematics

July 1, 2005

After the Cycle 5 MOA’s had been signed, the Department of Mathematical Sciences took certain steps to address the issues raised in the agreement. Soon after that the department was asked by the Executive Vice President for Academic Affairs, Dr. John Kozak, to prepare a strategic plan in preparation for an external review of the department and its academic programs. The department formed a strategic planning committee that prepared a plan which was approved by the department in January 2005. After the external review team was selected by the EVP, a copy of the department strategic plan was sent to the team in preparation for its visit on May 4, 2005. The team consisted of Professors H. Bass, University of Michigan, J. Garnett, University of California, Los Angeles (UCLA), and D. McClure, Brown University. The team concluded its visit on May 5, 2005.

Many of the issues raised in the MOA plus some new ones have been addressed in the department strategic plan and discussed with the external reviewers. We are currently waiting for feedback on our strategic plan from the external reviewers.

Now we give a progress report on the issues raised in the MOA of the department.

Actions agreed upon for the coming academic year:

1. Curriculum, Assessment, and Related Issues:
   a. Service Courses:

   A departmental subcommittee met with chairs of science departments in the spring 2004 to discuss changes in the existing calculus sequences. As a result, it was decided to offer, on an experimental basis, a new calculus sequence tailored primarily to science students. Because of the experimental nature of this sequence, we decided not to create a new course number for it, but instead to use the MAT 170-171-172 sequence for it. This sequence has not been offered for a number of years. This new calculus sequence was offered for the first time during the 2004-05 academic year, and on the request of the physics department it will be offered again in the academic year 2005-2006.

   In addition, based on a science departments’ request, we have changed the textbook for our regular calculus sequences. However, it is worth noting that recently many science students appear to prefer the MAT 147-148-149 sequence, which is a combination of pre-calculus and calculus and meets 6
hours a week, over the MAT 170-171-172 sequence. The MAT 147-148-149 sequence has become more and more popular to the extent that we had to offer two sections of it in the academic years, 2003-2004, and 2004-2005 and we plan to continue offering two sections of it in the next academic year, 2005-2006.

b. Assessment
In the academic year 2004-2005, the department assessment committee conducted a study to compare the performance of students from different calculus sequences: MAT 150-151-152, MAT 160-161-162, MAT 170-171-172, and MAT 147-148-149. The committee investigated the following questions:

Question 1. Do students perform differently on mathematics problems that are identical in every way except that one requires some basic reading skills?

Question 2. Our different calculus sequences cover essentially the same material but have slightly different objectives and audience. Are students in one of the calculus sequences better at handling math problems that require reading than students in the other sequence?

Following is a summary of the major conclusions:

1. Our calculus students do not perform significantly worse on math problems which require some basic reading skills than on those that do not require basic reading skills.

2. No significant difference has been observed in the performance of students in the different calculus sequences insofar as handling math problems that require some basic reading skills.

The assessment project in 2003-2004 was to evaluate the performance of MAT 130 (College Algebra) students. The assessment committee investigated two issues:

1. In response to a request from the science faculty we assessed how well our MAT 130 students could solve literal equations, namely equations whose solutions involve solving for one variable in terms of the others.

2. In trying to understand the reason for higher rates of Ds and Fs in MAT 130, we assessed to what extent such students took advantage of resources available to them.

The committee concluded that there was clearly a problem with the way the MAT130 syllabus addressed solving literal equations. Our students on
the whole did not adequately learn this skill, which is a crucial skill that is part of virtually all mathematics and physical sciences. This was a serious shortcoming that required our immediate attention. The MAT101-130-131 sequence is in the process of being redesigned, and this issue will be given due consideration in the new syllabus design.

In terms of student use of resources, perhaps this data reflects an unfortunate pattern of behavior that is probably at the root of why an at risk student is at risk, and ultimately fails. It is an important and difficult question to ask what to do about this. Perhaps the answer lies in the type of intensive advising being piloted by LA&S. The issue, of course, is to identify these students early enough to intervene in time for them to pass MAT 130.

c. Math/Science Initiatives

We are unaware of any activities conducted by the Natural Science and Math steering committee. However, the department has undergone an external review. As part of the external review process, we invited chairs of science departments, representatives from ISP and CTI to meet with external reviewers.

2. Students
   a. Benchmarking

We have obtained data from OIPR on the retention and graduation of math majors and compared them with national norms. Although the number of minority students majoring in mathematics is rather small, the retention and graduation rates seem to be consistent with the national average.

b. Outcomes

We contacted the College of Liberal Arts and Sciences Office of Development to get names of students who had graduated from the Math Department in recent years and we were able to contact a few of them. A department newsletter was working in progress, but it was delayed due to unexpected retirement of the faculty who was in charge of it. Furthermore, in the spring 2005, the department conducted for the first time an exit interview with some of our graduating seniors to get some feedback on their satisfaction with the education they have received at DePaul. We have gained some valuable information that we will use in future planning. We were also pleased with these exit interviews that we have decided to make them an annual event.
3. Enhancing Course Offerings

a. Undergraduate Program

We continue to ask the administration to support the department in offering Junior and Senior level classes with low enrollments. Our collaboration with CTI and the College of Commerce is less than satisfactory and we need to work more on it.

b. Graduate Program

i. Applied Statistics and Applied Mathematics Programs

Part (1) of the recommendations concerns the Applied Statistics program. The recommendation to incorporate technology into the curriculum is currently an integral part of the courses required to earn the M.S. degree in applied statistics. Except for MAT-451-453, which is a sequence on probability and mathematical statistics, the SAS and MINITAB software are used extensively in all other nine required courses. Additionally, other specialized software are also used in the sampling, design of experiment, time series analysis, and statistical quality control.

Part (2) is concerned with the Applied-Mathematics-Actuarial Concentration:

(i) Inviting speakers from the actuarial industry to enhance course content is an important objective that has been done in the past, but not often enough. Depending on who is teaching the basic sequence MAT-461-463, some instructors make a point of inviting experts in the field at least once per year to visit and give presentations to the class. We would like to have this practice done each quarter, with different emphasis depending on the material covered and the expert’s practice.

(ii) and (iii) Not much has been done in the area of developing a formal cooperative program between DePaul’s M.S. Actuarial Science program and some insurance companies, for which DePaul students may earn academic credit while working on rigorous projects for these companies. This is a worthwhile venture, but it needs a commitment from one or more “seasoned” DePaul mathematics faculty members who teach in the actuarial program. At this stage, the department lacks the resources and commitment to start such a joint venture. We are hoping that in a couple of years, with new hires and involvement of other colleagues in teaching courses in the actuarial concentration, this cooperative program may be initiated.

ii. M. A. M. Ed. Program

1. During the 2002-2003 academic year, the MAMEd program increased its offerings from 13 courses per year to 14 per year (while keeping the program requirements fixed at 12 courses). This was done by offering an additional course, Math 680 – Foundations of Calculus for A.P. Teachers, in the Spring of 2003.
We felt that Math 680 was a good addition to the MAMEd program and Dean Mezey granted us permission to run it again in the Spring of 2004. But in the Fall of 2003, with the benefits of 20-20 hindsight, we decided it was best to return, at least for the short-term, to our 13 course format.

More than half of our MAMEd students complete our program in 18 months. Thus they do not take any courses in the Spring of their second year. The remainder take one course per quarter. Thus these students do not need for the MAMEd program to offer two upper-level courses in the Spring of their second year. The bottom line is that Math 680 was competing against Math 651 for those students who did not finish in 18 months. Math 680 could have been a viable addition to the program. But, at this point in time, its survival might have been at the expense of Math 651. Thus, it was decided to return to our earlier format of 13 courses.

2. Regarding the manner in which GPAs are calculated when a graduate student repeats a course, the program director has some communications with the administration on this issue, but has not followed up on them and has not received any feedback.

4. Faculty

Although we have had two full sections of MAT 147-148-149 sequence in the last two years; nothing was done by the administration to give full teaching credit for the faculty who teach them. Each course in the sequence meets 6 hours a week, that is 18 hours per academic year; however, the instructor gets credit for 12 hours only. This has proved to be problematic for the department because the faculty is reluctant to teach it but at the same time the course is becoming more popular among students.

5. PeopleSoft Concerns

Some issues with PeopleSoft have been resolved but some still persist. For example, the department chair still cannot access the list of math majors or minors directly.

6. Issues Noted for Further Action

a. Part-time to Full-time Ratio

The high ratio of part time to full time faculty has improved slightly as we have had four to five visiting assistant professor (VAP) positions created in the past two years. We would like the teaching load of these VAPs to be 7
courses per year to be consistent with the teaching load of the regular faculty who have similar qualifications.

b. Associate Chair

No associate chair position has been created because of lack of support from the administration.

c. Development of a Departmental Strategic Plan

In the spring 2004, the Executive Vice President for Academic Affairs, Dr. John Kozak, asked the department to prepare a strategic plan in preparation for an external review of the department and its academic programs. The department formed a strategic planning committee that prepared a plan which was approved by the department in January 2005. After the external review team was selected by the EVP, a copy of the department strategic plan was sent to the team in preparation for its visit on May 4, 2005. The team concluded its visit on May 5, 2005 and its report is in progress.

d. The Pure Mathematics Graduate Program Proposal

The Pure Mathematics Graduate Program proposal has been made as part of the strategic plan. We are waiting for feedback from the external reviewers and the university administration on this proposal.