Final Report
Academic Program Review
Department of Mathematics and Statistics

I. Review Process

The Department of Mathematics and Statistics prepared a self-study following program review guidelines. An external review team, composed of three faculty/administrators from other institutions, visited the campus, reviewed the self-study, and interviewed unit personnel, students, and University administrators. The Program Review Committee (PRC) reviewed the external report and the self-study and discussed an early draft of this document with the Dean of Arts & Sciences. This document reflects the PRC’s findings and recommendations.

II. Self-study

Overview and Mission

The Department of Mathematics and Statistics offers a full range of undergraduate (B.S./B.A.) and graduate degrees (M.S./M.A./M.A.T./Ph.D.) and teaches required coursework for a variety of other majors on campus. In addition to teaching, the department takes its research responsibility seriously. The department mission is “to sustain a curriculum and program that meets the intellectual and vocational needs of [its] students, to foster a sound teaching environment, and to provide a setting for professional research in mathematics and statistics.” The self-study undertaken by the department yielded a thoughtful, data-based analysis of strengths and weaknesses and, in so doing, revealed a faculty striving to become one of the best in the country.

Budget/Facilities/Support Staff

While not satisfied with its current operating budget particularly related to travel support, the department acknowledges some relief since the University assumed technology expenses. The Mathematical Sciences Building adequately houses department faculty and most of their instructional needs. Proximity of faculty and students, and the presence of faculty and student lounges contribute to a "family atmosphere." The three clerical staff seem sufficient for the needs of the department.

Faculty/Students
Historically, the department has had around 30 FTE faculty. Due to retirements, the tenure-line faculty currently number 23.5 FTE. By next year the faculty will have increased to 25.5 FTE. This is still a decline from 31 FTE in 1995. Two instructors are not part of this FTE count. The department also has two visiting research lines, which are usually available on a semester basis. One, the Distinguished Lukas Professor, enables the department to bring in top-caliber researchers from other universities. With their reduced FTE count, keeping up with the usual service demands of a large department, in addition to their teaching and research commitments, has led to high stress among the faculty. The thoughtfulness and care with which they conducted their self-study reveals a faculty with high standards. Thus, their frustration in trying to "do it all" with smaller numbers.

The Department of Mathematics and Statistics uses a differential faculty load policy. Those publishing approximately one paper a year and active with graduate students teach 2-2 courses a year and are assigned to the Research Emphasis merit category. Those publishing some research are assigned to a General Emphasis category and teach 2-3 or 3-3 courses a year. Non-researchers are assigned to the Teaching Emphasis category and teach 3-4 or 4-4 courses a year. A fourth category is employed for those with heavy service or administrative loads.

Since 1990 the department has produced close to five doctoral degrees a year, and approximately twelve master's degrees. Employment for these students has been exceptionally high. However, the department is quite concerned that its graduate applications are dropping. In 1996 and 1997 these declined by 50%. Despite the decline, which is also occurring nationally, the department has enrolled approximately 60 graduate students in the past two years; 50 are supported by graduate assistant stipends. Stipends are low compared to competitors, a point of considerable concern to the Department in this time of high competition for students. This fall they recruited 19 new students, of whom one was at the doctoral level. About 56% of the master's level graduate students are women. While the Department's target is to have 60% master's students and 40% doctoral students, it feels it may have to recruit more master's students and encourage them to stay on for the doctorate.

Undergraduate majors number 170, of which 120 are majoring in mathematics education. The remaining 50 are spread across statistics, mathematics, and actuarial science. Another 5692 non-majors enroll in the department’s courses on a yearly average. Semester SCHs run 12000-14000.
Curriculum/Pedagogy

The department offers the Ph.D. degree in four areas: 1) statistics/probability (currently staffed by seven faculty), 2) algebra (six faculty with an additional line being hired this year), 3) analysis (six faculty), and 4) applied mathematics/scientific computation (two faculty with an additional line being hired this year).

In addition, they offer the M.A. (three tracks), the M.A.T. (Master of Arts in Teaching), and the M.S. in Applied Statistics (jointly with the Department of Applied Statistics and Operations Research [ASOR]). At the undergraduate level they offer the B.S./B.A. in Mathematics (with tracks in Applied Mathematics, Actuarial Science, and Statistics) and the B.S. in Mathematics Education through the College of Education and Human Development (three faculty). A common problem at all degree levels is the placement of the statistics major under the name Mathematics and under the course prefix of MATH.

Service classes offered for the rest of the University span the range from Remedial Mathematics through Calculus. These courses have been developed to meet the needs of various colleges. Graduate student teaching assistants teach 58% of the department’s total SCHs, primarily at the 100-200 level. In 1992 the department eliminated large sections. Most of its courses now have 30 or fewer students. Results have been favorable. Students are absent less and feel less intimidated. Grades have risen commensurately. An innovative practice started recently is the hiring of high school teachers to teach Math 095. Many of these teachers are part-time M.A.T. students who receive tuition waivers. The course also has a tutorial laboratory.

The self-study suggests that curriculum development is ongoing in the department, with considerable thought and care about the courses being offered, their sequence, and currency. Some faculty voiced frustration about the inability to offer specialized and advanced coursework for doctoral students. As enrollments have declined, some of this work has to be offered on an individualized basis.

Student course evaluations for 1997 rate instructors high. The students were asked to rate the instructor from “one of the best” to “one of the worst.” Evaluations were analyzed according to course type; faculty were not separated from teaching assistants. No response sizes were indicated. Data were not provided for other years as this information is retained at the department level for only one year.
Student Outcomes Assessment

The Department of Mathematics and Statistics has seven goals for its undergraduate majors. The last two years it has attempted to assess student progress in reaching these goals, primarily through exit surveys, interviews, student teacher supervisor assessments, and scores on national exams in teacher education and actuarial science. They envision expanding their assessment tools to include samples of technology projects, written projects, and oral presentations. The self-study suggests that the department is using the information it is collecting to refine its curriculum and pedagogical techniques.

Voluntary exit interviews are conducted with each graduate student. Other tools used to assess graduate learning outcomes are the comprehensive and preliminary examinations, job placement information, and assessment of the research productivity of the doctoral alumni/ae.

Scholarly Productivity

The faculty on average publish over one scholarly article a year. Faculty in several areas of the department publish considerably more than this. In the last five years only two faculty members have not published anything. Also, in the last five years, seven of the faculty have received external research grants.

Service

Many of the faculty serve as editors, referees, and reviewers for the top mathematics and statistics journals. They are active in speaking at other universities and at conferences. Some act as statistical consultants formally through the Statistical Consulting Center and on a more informal basis with colleagues on and off campus.

Status Indicators

In 1988 Econometric Theory ranked the BGSU program in statistics 67th in the world. More recently, in 1995 the National Research Council ranked the doctoral program 114 out of 133 programs. (Kent State and the Univ. of Cincinnati were ranked 86 and 105 respectively.) The statistics program has won State of Ohio Awards of Excellence. The Canadian Journal of Statistics ranked BGSU statistics faculty ahead of all regional institutions in productivity except OSU and the University of Michigan. BGSU was ranked 86th of 150 institutions.
III. Results of Previous Reviews

This is the first cycle of Program Review for the Mathematics and Statistics Department.

IV. External Review Team’s Report

Strengths Noted by the External Reviewers

The external reviewers felt the department was strong, and that it took its duties in teaching, research, and service very seriously. The reviewers remarked on the thoroughness and thoughtfulness of the self-study. They noted that both undergraduate and graduate students expressed satisfaction with their education. They applauded the move to small class sections. Proposed curricular changes in the actuarial and education programs, as well as others, were pronounced meritorious. The external review team called the instructional program as a whole “diverse, up-to-date, innovative, and consistent with the mission of the University.” The review team commented on the quality of the undergraduate majors, particularly as represented by the performance of the Putnam Team.

The reviewers praised the summer orientation program for teaching assistants. They also noted that the campus visit seemed important in recruiting current students, and that the Graduate Coordinator had played an essential role in recruitment. They mentioned the good placement rate of graduate students, particularly those in pure mathematics.

The reviewers supported the general hiring plan proposed by the department, with the goal of maintaining strength in the four areas of doctoral study. They commented that the department was doing a “remarkable job” given its understaffing.

Weaknesses Noted by the External Reviewers

The few weaknesses noted by the external reviewers were generally related to the degree of understaffing in the department. The reviewers recognized that the faculty were overworked and declared that the degree of vitality still demonstrated under such conditions was “amazing.” While they agreed with the proposals for curricular change envisioned by the faculty, they did not see how all these initiatives could occur until the faculty FTE was increased. The reviewers offered some suggestions for curricular change in the undergraduate options, noting particularly that the number of credits in mathematics in the pure mathematics option was low, and that other options, such as statistics, had low visibility. The inconsistent use of technology across the faculty, though typical nationally, was also a concern.

The external reviewers felt that the faculty hiring plan should focus more attention on mathematics education since the faculty in that area served the greatest number of undergraduate majors. Given the potential for increased
popularity of the M.A.T. degree, as well as the undergraduate teaching degree, the reviewers felt the plan for hiring one additional faculty member in mathematics education was insufficient. The review team also felt that viewing analysis and applied mathematics as one group was not a good idea, and that each area should be independently strengthened. Lastly, the reviewers expressed concern over the small number of women faculty in the department, especially since the majority of its graduate students are women. It also urged continuance of the department’s efforts to hire minority faculty.

**Recommendations by the External Review Team**

The external review team made the following recommendations:

- expand the Statistical Consulting Center to include outreach to industry;
  - load the director .75-1.0 FTE;
  - give additional consulting opportunities to graduate students and undergraduates;
- offer a separate degree in statistics as recommended in the self-study;
- study the ramifications of a merger with ASOR more fully (The team did not meet with ASOR so felt unprepared to make a recommendation, although they listed both advantages and disadvantages in their report.);
- form a Division of Statistics as recommended in the self-study;
- assure that students have access to technology innovation;
- use Web-based instruction for some courses instead of traditional sections taught by graduate assistants;
- use undergraduates as instructional aids and fund them with Undergraduate Assistantships;
- raise graduate stipends and use other aggressive means to recruit graduate students. They urged this recommendation be given “extremely high priority”;
  - raise graduate stipends to a competitive level;
  - offer Research Assistantships;
  - relieve faculty through additional hiring so individual faculty can spend more time recruiting;
  - use current students (who are enthusiastic about their program) as recruiters;
- as FTE increases allow, continue with curriculum changes suggested in the self-study, especially the possibility of a continuous Master’s to Ph.D. program;
- add seven to eight tenure-track faculty so that target numbers would be as follows: applied math, three to four; math education, three to four; algebra, six; analysis, six; statistics/probability, eight to nine. This recommendation somewhat lessens the number proposed by the department for algebra and increases it for applied math and math education;
- give serious attention to hiring women and minorities on the faculty and to recruiting minority doctoral students;
- use external peer review, perhaps every three years, to eliminate perceived inequities in judging the quality of research;
- increase funding for visiting professors and their students;
• employ a systems analyst to maintain and expand existing technology and the World Wide Web capabilities.

V. Program Review Committee Findings

Strengths Noted by the Program Review Committee

Scholarly productivity and vitality. The PRC acknowledges and commends the department for its historically-strong scholarly perspective and productivity, for the vitality that was noted by the external reviewers, a vitality that continues even under stress, and for the thoughtful reflection demonstrated in the self-study. We trust that the department will build upon its analysis of strengths and weaknesses so that the future brings an increase in the national visibility of Mathematics and Statistics at Bowling Green State University.

Positive progress in undergraduate and graduate education. In addition to its scholarship, the PRC feels another strength of the department is the acceptance of its responsibility to provide quality instruction to all students, major and non-major. The decision to go to smaller class sizes for undergraduates was a courageous one. While it has caused staffing problems, the positive changes in undergraduate performance and satisfaction support the decision. The performance of the Putnam Team, the success of the mathematics education students, employment prospects for the actuarial science students -- all speak to the strong education that mathematics and statistics majors are receiving. The PRC further applauds the department’s efforts to build a sense of community among its majors.

At the Graduate level, the Lukacs Symposium and the presence of the Lukacs Professor give graduate students the opportunity to interact with top scholars from other universities. The PRC sees the productivity of the faculty as an excellent model for each of the doctoral students. Student success in passing comprehensive exams and in achieving employment in academia or business is most encouraging, as is the number of master’s students who are accepted to further study at other institutions.

While the department is understandably concerned about its recruiting challenges at the graduate level, the PRC congratulates it on the successful recruiting that has occurred and on the innovations it has initiated. Current recruiting mechanisms, to include the campus visit, the Summer Fellowship Program, the agreements with Poland and with Florida A&M, the inservice M.A.T. program -- all of these speak of a faculty which is not sitting idly and to a Graduate Coordinator who has been aggressive on the faculty’s behalf.

Internal functions. In the area of service, the PRC commends the department on the consulting activities of its faculty, on its participation in the Statistical Consulting Center, and on the relatively smooth way in which the unit seems to run. In particular, we wish to single out the differential loading/merit policies of the department, which allow individual differences among the faculty
while still maintaining overall department strength in all three areas of teaching, research, and service.

Areas of Concern Noted by the Program Review Committee

External funding. The department is justifiably proud of its scholarly productivity and of its ability to share this scholarship with its doctoral students. However, the scholarship of truly topnotch departments is marked both by their productivity and their ability to gain external support for that productivity. Relatively unmentioned in the self-study was the department’s failure to secure external grants compared to the opportunities available to the discipline. The PRC feels that an increase in external funding, both through research grants as well as corporate partnerships, is absolutely necessary for a doctoral department of top caliber. In addition to supporting the investigator’s research, such funds would provide the department with several of the items for which it has expressed a need: namely, research assistantships, increased travel allowances, postdoctoral positions, attractive recruitment tools, and consulting opportunities for graduate students.

Hiring plan to increase faculty size. The PRC shares the department’s belief that it is currently understaffed and agrees with both it and the external reviewers that the unit should eventually be returned to FTE levels of at least 30. That being said, the PRC feels the department needs to rethink its proposed hiring plan. Even with additional faculty, should the department be trying to cover so many content areas? Should it find a smaller niche at the graduate level in which it could be unique/best in Ohio and one of the top in the nation? With its current and historical strength in statistics and algebra, for instance, should these two areas be strengthened even more and the number of faculty in other areas maintained or decreased through attrition rather than increased? The PRC understands the need to have balance in programs, but at a university such as Bowling Green, would it not be easier to reach national prominence with a “niche approach?” We respect the department’s thoughtful approach to planning and understand its right to determine its own direction. At the same time we do question generally the external review team’s advice to expand the number of faculty in applied mathematics and mathematics education as well as the department’s plan to grow in analysis and applied mathematics. Before these moves take place, the PRC urges the department to reconsider its strategies for becoming outstanding, given the constraints of limited resources. We also insist that the hiring plan deliberately focus on hiring faculty who will be able to generate external funding.

The PRC was delighted with the number of women that the Department of Mathematics and Statistics is attracting to its majors, but feels with the external reviewers that very serious attention needs to be paid to the hire of women faculty. The self-study was notable in its lack of focus on this weakness; yet, the definition of a quality department includes diversity in both students and faculty. Since about 25% of the doctorates being granted nationwide are now being granted to female mathematicians, this time would seem exceptionally positive for making such hires. While the pool is less strong for minorities, recruitment of
minority faculty would surely help in the effort to recruit minority students. Once in place, the department should provide these hires with quality mentoring.

Lastly, it is clear that mathematics education needs more staff; however, the PRC feels that the issue of how best to serve those students needs to be more thoroughly addressed in conjunction with the Curriculum and Instruction faculty in the College of Education and Human Development. It is our understanding that the mathematics educators in Mathematics and Statistics teach the “content” courses while the mathematics educators in Curriculum and Instruction teach the “methodology” courses. The self-study was unclear as to how well these two groups cooperate/ collaborate. We wondered why the undergraduates needed their own segregated, content courses and whether these students were given the opportunity for supervised practicum experiences in the mathematics service courses (a practice which might also help those teaching these courses). The PRC believes that Education as well as Mathematics and Statistics should be involved with all future planning for this area. Determination of which unit should be the faculty home, of whether dual appointments would be feasible/useful, and of how best to serve the education major within their mathematics specialization should be the result of joint discussion between the two groups.

**Staffing service classes in mathematics.** It is ironic that the pedagogical move to smaller classes has helped the students in those classes, but has created a staffing nightmare for the faculty. While both the department and the external reviewers seem to feel the primary solution to this problem is increased recruitment of graduate students, the PRC sees the solution more broadly. Rather than relying so strongly on graduate assistants, we suggest a multifaceted attack on the problem. Our concern is that the need for teachers could force the program into recruiting graduate students for the wrong reason. The goal of graduate student recruitment should always be to obtain the best qualified students for graduate study. We worry that the basic premise that graduate students are the primary way to staff the service program is blinding the department to other staffing solutions. The list below could be part of this multifaceted attack on the staffing problem:

- hire more full-time tenure-track faculty. More full-time FTE plus a more tightly focused graduate program would free more faculty time to teach undergraduates;
- hire more full-time instructors/lecturers;
- hire more part-time instructors;
- create more Web-based instruction with tutors on-call;
- create more peer tutoring, using talented undergraduate mathematics education majors;
- expand the Supplemental Instruction program;
- explore with the University’s Undergraduate Council the possibility of other units creating quantitative reasoning courses of a non-mathematical nature. Some departments/colleges might be interested in substituting or including such courses within their current “mathematics” requirements;
- further strengthen relations with the Math Lab.
The Question of Merger with Applied Statistics and Operations Research. The external review team did not meet with ASOR faculty so they felt they were unable to make a recommendation on this issue. The PRC has considered their positive and negative comments and made a list of our own.

**PROS**

- would strengthen the statistics area on campus, especially at the undergraduate level
- all statistics courses would be listed in one place with one prefix STAT
- the area would flourish in Math/Stat where it seems to be dying in the College of Business Administration
- would bring women faculty to the Math/Stat department to complement their student enrollment
- might eliminate some redundancy in statistics courses across the campus
- would simplify logistics of running the M.A. in Applied Statistics, which they already share
- would centralize the responsibility for the Statistical Consulting Center in one department.

Math/Stat’s progressive differentiated loading and merit policy can fairly treat any less research-oriented faculty in ASOR

**CONS**

- biggest problem: ASOR does not want to merge
- where does Operations Research go: Mathematics & Statistics, Computer Science, or another department in the College of Business Administration?
- the addition of faculty to statistics may camouflage needed increases in FTE
- can the Math Sciences building house the added faculty?
- the effect on the College of Business Administration has not been explored

**Graduate student recruitment.** The PRC shares the department’s concern that it be able to recruit top students into its Master’s and Doctoral programs. It agrees that the department is at a disadvantage in the stipends that it is able to offer. As the Graduate College works through the issue of competitive graduate assistant stipends, we recommend that the Department of Mathematics and Statistics be a beneficiary of any decisions.

The PRC feels the suggestions made by the external team to reassign time for faculty to recruit and to use current students as recruiters were helpful. Each individual faculty member, however, must also take more responsibility for
recruiting their own students. Perhaps the department is overly-dependent on the Graduate Coordinator to do most of the student recruiting. Indeed, it may want to re-examine the system of “academic advisors” and mentors. Ultimately, students come to study with particular professors so those professors must network more to make their availability and interests known and then work directly with those students as soon as they arrive on campus. Again, more external grants would allow professors to recruit research assistants independently of the department.

In thinking through this problem, the PRC urges the department to uncouple the service program from recruitment as much as is reasonably possible. While the service program can provide stipends for students, there are other stipend sources as well. The department should consider raising money for department graduate fellowships, as well as lobbying for new consulting assistantships administered through the Statistical Consulting Center (as opposed to the current practice of the department “loaning” assistantships to the Center). Lastly, the pedagogical idea of a combined master’s-doctoral program sounds quite likely to attract potential students and should be pursued.

Formation of a Division of Statistics. The PRC recognizes the need for subsets of faculty who meet to work on programmatic issues. This need certainly seems the case for statistics and for mathematics, or some other grouping. We would like to warn, however, that a danger in forming such groupings is that the department may become philosophically or socially split along area lines. It must be clear that the purpose of these subgroups would be purely programmatic/logistic. The department would still have its faculty meetings and other gatherings as a whole. If a leader is elected, that leader should only be advisory to the department chair in making teaching assignments. We also would suggest that the term Division be avoided. In some Colleges on the Bowling Green campus, a Division is the equivalent of a department in structure and function. We would suggest instead the term “program area.” We also think that forming one program area does not make sense unless there is at least one other program area.

Course evaluations. While the PRC was pleased to see the high instructor ratings given in 1997 to all course groupings in the department, we also noted that no evaluations were reported for other years. While the department chair has clarified that the department does require course evaluations for every course every semester, we are puzzled as to why these are not retained for longitudinal study. We also wondered about the attrition rates in each course and whether the 1997 efforts were so positive because they sampled “survivors” only. We ask the department to create or employ an established method of course evaluation that focuses on student learning rather than teacher behavior. We further ask that they use this method regularly and indicate response rates when reporting results. We also encourage the department to use other methods of course evaluation regularly, such as peer evaluation of live or videotaped instruction. Lastly, we urge the department chair or program area coordinators to use this information in the professional development of all individuals teaching. That means the data must be retained and studied over time by the
department rather than used only for merit or tenure/promotion considerations.

Recommendations by the Program Review Committee

This section of the review provides recommendations and time lines meant to help the Department of Mathematics and Statistics build on its current strengths in order to grow in national prominence.

1. **Provided there is satisfactory progress on all aspects of recommendations 2-8, we recommend that the Dean of Arts and Sciences provide additional FTE to the department, returning it to at least 32 FTE, including instructors/lecturers, by August, 2003.**

2. **We recommend that the department redouble its efforts to obtain external funding both from governmental and corporate sources.**
   
   a) Submissions and grant monies generated should be monitored yearly by the department chair and discussed yearly with the Deans of Arts and Sciences and the Graduate College.
   b) By the next program review, standard criteria should show the department among the most productive at the University.
   c) As the number of funded grants increases, the Dean of Arts and Sciences and the Dean of the Graduate College may wish to reward the department with additional graduate or undergraduate research assistantships collaboratively-funded between principal investigators and the University.

3. **We recommend that by January, 2000 the department show the Dean of Arts and Sciences that it has thoroughly reconsidered its hiring plan in light of:**
   
   a) the PRC’s comments on niche programs;
   b) the need to hire researchers who can obtain external funding;
   c) the need to increase the diversity of its faculty; (To the extent that this effort is hampered by a lack of money, we urge the University to be more financially-supportive of department hiring attempts);
   d) the need to collaborate with the College of Education and Human Development on any hiring for the mathematics education program.

4. **We recommend that the department develop a written, multifaceted plan to staff its service classes in mathematics and statistics and to increase the quality of instruction in those classes.** The plan should be completed by May, 2000.
   
   a) This plan should include several of the solutions suggested in the PRC’s findings.
   b) The plan should diminish the need for graduate assistants in the program.
   c) The plan should involve the Undergraduate Council in discussing the suggestion that other units create quantitative reasoning courses that could relieve enrollment pressures on Mathematics and Statistics.
d) The plan should include new methods of course evaluation that focus on student learning.
   i) These methods must be used regularly and systematically in all classes.
   ii) These methods should be implemented Fall semester, 2000.
   iii) A summary of each section’s course evaluations must be kept on file in the department office for the 7 year program review cycle. The results must also be reported to the Dean of Arts and Sciences on an annual basis.

5. The PRC will not include its recommendations concerning the relationship between Mathematics/Statistics and ASOR in this report. The external team’s report for ASOR has been delayed due to illness. The PRC’s recommendations concerning the relationship between these two departments will be included in the Final Report for ASOR.

6. We recommend that the Department of Mathematics and Statistics form a program area in Statistics and one or more in Mathematics. These areas should be formed by January, 2001.

   As part of this reorganization, we urge the faculty to adopt strategies for maintaining the cohesion of the department. We further recommend that:

   a) the faculty develop separate degrees in statistics as needed;
   b) in collaboration with ASOR, the applied statisticians in Mathematics and Statistics should participate more in the Statistical Consulting Center by:
      i) working to extend the services of the Center to business and industry on a fee basis;
      ii) lobbying for a full-time director partially paid by the University and partially paid out of funds generated by the Center;
      iii) lobbying for new graduate assistant stipends that would be controlled by the Consulting Center;
   c) the department develop a separate prefix for all statistics courses in Mathematics and Statistics;
   d) all program areas focus on improving their undergraduate major curricula, as suggested in the self-study, increasing enrollments, and guaranteeing quality instruction.

7. We recommend that the department continue to institute new/additional methods of student outcomes assessment that focus on both undergraduate and graduate major programs. The department should report progress on assessment, including its impact on the curriculum and instruction, on an annual basis, in collaboration with the Student Achievement Assessment Committee.

8. We recommend that the department develop a plan for updating all faculty in the appropriate technologies for classroom instruction. This plan should be implemented by Fall semester, 2002.

   The plan should include provision for
a) reassigning time for faculty to learn the technology;
b) inservice workshops, perhaps within the new program areas;
c) increasing the number of Faculty Instructional Improvement Grant applications;
d) hiring a systems analyst for the department.

The Department of Mathematics & Statistics should report annually to the Dean of Arts & Sciences, with a copy to the Provost, on the implementation of these recommendations.