Comprehensive Program Review – Self-Study
Department of Mathematics
November 01, 2007
Revised June 30, 2008

EXECUTIVE SUMMARY FOR THE BACCCALAUREATE DEGREE IN MATHEMATICS

Major Findings of the Program's Quality and Productivity

We have reasonably judged our program to have an *above average* rating for program quality and an *average* rating for productivity. Evidence of the strength of program quality comes from the success of our graduates in job placement and performance on national assessment exams. Key to the success of our students has been the commitment of our faculty to continued professional development and their involvement of undergraduates in formal and informal research. We see positive trends in program productivity, as evidenced by gains in numbers of majors, enrollment in upper division courses, and graduation rates.

List of Recommendations for Improving Program Quality

1. *We must improve the student advising process.*

2. *We must guarantee that research projects are reliably available to a growing number of undergraduates, and sustaining faculty participation is key.*

List of Recommendations for Improving Program Productivity

1. We *must find ways to guarantee that first-semester freshmen mathematics majors are correctly advised and their progress closely monitored during their first year.*

2. *We must find ways to recruit and retain minority students.*

3. *We must remove impediments to developing student interest in the Applied Statistics Track of the BS and in the baccalaureate in Mathematics Education.*

Conclusion about the Program's Viability at CSU

Based on trends in our graduation rates and enrollments in key courses, we view the Mathematics program's viability to be satisfactory. In 2005-2006 we beat the estimated national average for the percent of all bachelor's degrees that were awarded in mathematics and we improved upon that rate in 2006-2007. The fall 2007 enrollment in the senior seminar course is 14 – a good sign that the annual number of degrees conferred will rise. As part of our annual assessment process, we have carefully considered explicit suggestions from graduating seniors, implicit suggestions from student performance on national assessment exams, and specific dictates from state agencies. As a result of ensuing thoughtful discussions, we have implemented a significant number of curriculum changes that have:

- stoked student interest in the study of mathematics, to the extent that the number of majors continues to rise, and the enrollment in a key-indicator course is increasing,

- demonstrated that the goal of producing mathematics majors who enjoy teaching high school students is achievable, and

- verified student interest in participation in the act of "doing mathematics" in undergraduate research.

Clearly, curriculum assessment is an active part of doing business in the mathematics program. Our analysis of data presented by the VPAA's office shows existing positive trends in numbers of majors, enrollment in upper division courses, and graduation rates. We anticipate further studies of opportunities that will attract some of the best students in Biology, Chemistry, and Computer Science to the idea of the "double major" or major/minor. As a consequence, we see continued, controlled growth and development in the baccalaureate degrees in mathematics.

Program Improvement Plan

We find that there are opportunities to improve both the quality and the productivity of the mathematics program. To improve program quality, we must increase student participation in research experiences, which thus far have been limited to only a select handful of students. Achievement of this outcome hinges on the following:

1. Seeing to it that faculty members who would foster and support undergraduate research have reasonable opportunities to conduct substantial research of their own.
2. Finding a way to count faculty involvement in undergraduate research as a part of the regular teaching load.

Program productivity will improve when we recruit more students and do a better job of retaining students already in our program; we still need to find ways to recruit and retain minority students. The greatest recruitment opportunities rest in the applied statistics and secondary education programs of study. We will attract students to our applied statistics program by reducing the number of pre-requisites necessary to take applied statistics courses. Students have shied away from the secondary education program because of the foreign language requirement; we will modify the program to eliminate this requirement. In order to improve student retention, we will devote increased attention to advising. In particular, we must find ways to guarantee that first-semester freshmen mathematics majors are correctly advised and then closely monitor their progress during their first year.

Summary Recommendation and Supporting Rationale

We recommend **Maintaining the Program at the Current Level.** Our self-assessment points to a highly active faculty whose members have a high regard for undergraduate research and other professional interaction with students outside the classroom. Enhanced professional development of our faculty is easily the most important issue in maintaining and improving the quality of our program.

We see a need for small curriculum changes in two of our programs that will likely draw more students to our Applied Statistics Track in the BS and the BA in Secondary Education. These changes could have a substantial impact on enrollment in the near term. In addition, a further positive impact on productivity will come from a thoughtful reconsideration of our student advising process, particularly for incoming freshmen. Changes identified so far include early identification of at-risk students by screening SAT scores, mathematics course placements and student course schedules. Extra support and encouragement should be offered to those students deemed to be at risk.

In summary, all changes necessary to increase productivity should be in place in the fall of 2008. Our analysis of data presented by the VPAA's office shows existing positive trends in numbers of majors, enrollment in upper division courses, and graduation rates. With changes we have identified, we anticipate continued growth in our program.

I. Brief Program Overview

Describe the program, the program mission, and the relation to the Columbus State University mission. Describe how the program meets the needs of students and the demand for graduates.

CSU offers the following degrees in mathematics: Bachelor of Arts, Bachelor of Arts and Secondary Education, Bachelor of Science in Mathematics, and Bachelor of Science - Applied Mathematics Concentration. The program mission directly relates to the following statement of institutional mission:

> The University is dedicated to excellence in teaching in a student-centered environment, research and creative activities, service to the region and the state, and community engagement through university-community partnerships.

Mathematics degree programs reflect a commitment to the preparation of secondary mathematics teachers and professionals conducting research in mathematics or applying mathematics in science or business, all supporting needs of the community, region, and state:

- The Bachelor of Arts programs are designed to provide students with a broad exposure to mathematics, including coursework recommended by the Conference Board on the Mathematical Sciences for the mathematical preparation of secondary Mathematics teachers.
- The Bachelor of Science aims for an exposure to mathematics that is broad enough and deep enough to prepare students for graduate study in mathematics.
- The applied Mathematics program – which features tracks in actuarial Mathematics and statistics – aims to provide a balance of theoretical and applied coursework sufficient to prepare skilled problem solvers for work in industry or graduate studies in math/statistics.

II. Summary Findings of the Program's Overall Quality

Repeat the major findings of the program's quality as reported in the executive summary and cite any additional detailed analyses, interpretations, or rationale that support this summary judgment. This summary should be consistent with the pattern of strengths and weaknesses observed among the indicators of program quality that follow.

Data collected and analyzed point to a program having an overall quality of "above average," at least:

Meeting expectations: As would be expected of any discipline, we have established a well-defined link between our program's curriculum and its outcomes. Furthermore, data show our program attracting stronger students, with higher SATM scores, and with cohort retention rates that exceed those of the institution (except for a portion of one cohort, which we have analyzed in detail). In increasing numbers, some of these students have engaged in undergraduate research with members of a highly active, highly qualified, and academically diverse faculty.

That our program has been successful in preparation of our students is demonstrated by scores on national assessment exams and by the number of placements of our graduates in secondary educations positions, actuarial positions, and postgraduate studies. In addition, modest feedback from graduating seniors, alumni and one advisory committee suggest overall satisfaction with our program. We have carefully considered

student suggestions for improvement, implementing two new tracks and a new minor as a result. Likewise, we have thoughtfully reviewed new expectations of the CBMS, designing a baccalaureate program in mathematics that leads to certification at the secondary level in mathematics.

Exceeding expectations: There are several emerging trends that suggest increasing quality of our curriculum.

- *First* we note the high degree of success of Mathematics Education students on the PRAXIS II and GACE exams. We want to point to the thoughtful course design and delivery by faculty who teach courses that not only directly impact those scores, but also have dual enrollments of both Mathematics and Mathematics Education majors.

- *Second* we want to acknowledge substantial student success in special research projects with faculty, resulting in student presentations in colloquia and regional conferences, research papers written, and an Honors Thesis presented. These projects and other undergraduate research activities have all been accomplished with a significant commitment of faculty time and energy, above and beyond the usual teaching assignments, and not counted as part of the regular teaching load.

- *Third*, we should highlight the fact that the Actuarial Track of the BA in Applied Mathematics, created in part as a result of student suggestions, has produced a collection of graduates having the distinction that three have already taken actuarial positions. With the publicity of high entry salaries, the actuarial profession has become highly competitive, and the success of our graduates is noteworthy.

Methods for improving program quality:

It should not be surprising that we see the greatest opportunities for improvement to be those areas that directly impact student/faculty interaction.

1. We want to see research projects reliably available to a growing number of undergraduates. Sustaining faculty participation will require taking action in two ways:

    - *First, we must find a way to count faculty involvement in undergraduate research as part of the regular teaching load.* It is unreasonable to expect a sustained and growing involvement of faculty that is built on faculty largesse.

    - *Second, we must see to it that faculty who participate in undergraduate research have a reasonable opportunity to conduct substantial research of their own.* Whether as a *post facto* reward for sustained achievements of mentored students, or as a consequence of a specific application to support future undergraduate research activities, faculty should be given the opportunity for release time to conduct productive research.

2. Additionally, *we see a need to improve the student advising process.* During process change, we need to consider several issues, such as the common reluctance of many students to have direct faculty involvement; the high numbers of advisees for Mathematics Education faculty; distinctions drawn by faculty between clerical duties associated with "advising", and those activities dealing with classroom issues, career issues, and personal issues; and recent decisions at the System level about future advising procedures and technological support. Changes identified so far include early identification of at-risk students by screening SAT scores, mathematics course placements and student course schedules. Extra support and encouragement should be offered to those students deemed to be at risk.

3. We need to differentiate program outcomes for all of our degrees and all of our tracks.

II A. The Quality of Teaching Supporting the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of teaching supporting the program as "above average," particularly because of the abundance of faculty-student interaction.

- **Explain how good teaching is assessed and rewarded.**

Teaching is the main activity of the mathematics faculty and forms the most significant component of annual evaluations and merit-based raises. The annual evaluation process followed by the department considers noteworthy teaching successes during the year, results of student evaluations of instructors and courses, peer review of course materials, Chair review of course materials and/or results of classroom observation by peers. Appendix 1 contains a sample evaluation form. Merit increases are weighted heavily on teaching performance.

- **Explain how good advising is assessed and rewarded.**

The department recognizes the importance of advising in attracting and retaining students. However, at this time the department does not have a clear means of assessing good advising. Advising of students is shared by all members of the department, and not limited to registration times.

- **Describe opportunities for interaction that occur between faculty and students outside the classroom**

Opportunities for Student-Faculty Interaction

Students and faculty interact outside of the classroom in several ways, including the following:

Research projects. Several faculty members have worked closely with small groups of students through research experiences – either as part of a class or as an extra-curricular activity. Special topics courses have been offered to give students an organized opportunity to engage in original mathematical work; this has lead to the creation of a permanent course for student research experiences. Several faculty members have crafted special projects for students that resulted in some form of public presentation by students. Our students have presented in the CSU Student Colloquium, the GCTM conference, and the annual meetings of the Southeastern Section of the Mathematical Association of America.

Club meetings. CSU has two math-related student organizations – the MAX Club for students with interests in Mathematics and computer science, and the Math Education Student Association (MESA) for students with an interest in teaching grades K-12. Faculty members attend student club meetings to show support and help plan activities; they also have sponsored student participation in regional and national meetings.

Math tournament. Students are encouraged to help the department faculty with the annual CSU Math Tournament. They assist in the setup and cleanup of the facilities, proctor exams, run errands, and serve refreshments to tournament participants. Once tournament cleanup has been completed, students are invited to join the Mathematics faculty for dinner and debriefing.

Colloquium presentations. The Mathematics Department organizes colloquium presentations that are open to the public. Speakers are encouraged to present their talk at a level appropriate for undergraduate student involvement. Students occasionally use the department colloquium as a forum for presenting a talk and getting faculty feedback prior to a conference presentation. A recent presentation by Aflac provided students with important insights into the Actuarial profession and related day-to-day responsibilities.

- **Indicate the availability of tutoring**

Availability of Tutoring

In addition to the availability of faculty assistance during their office hours, students have several resources upon which to draw for instructional support. The University College staffs a Math Lab to provide free tutoring in core Mathematics courses. Finally, the Mathematics Department maintains a contact list of private tutors who work for hourly fees.

A low number of students have participated as tutors in the Math Lab. Our students appear to prefer higher paying, off-campus employment (Math Lab tutors receive minimum wage). Few of the tutors that we do get are comfortable tutoring MATH 1101 Introduction to Mathematical Modeling and MATH 1127 Introductory Statistics.

- **Describe opportunities for internships, service-learning, practica, study abroad, and career planning and placement**

Opportunities for internships, service-learning, practica, study abroad, and career planning and placement

CSU Mathematics students enjoy many opportunities to enrich their education outside the classroom. Two of our recent graduates – Jennifer Close and Sandra Gaskins – worked at Fort Benning through the Career Center internship program. The Career Center offers its services to teach students about resume preparation and interviewing skills. The CSU Servant Leadership Program provides students with a structured program through which they can participate in community service and learn leadership skills. CSU also boasts a very strong study abroad program, with opportunities to spend a summer taking courses in places such as Russia, Kenya, Belize, Australia, and the Bahamas, as well as the chance to spend a year studying at Oxford University.

- **Describe methods to be pursued for program improvement.**

1. We need to find ways to attract more students to tutoring. Possibilities include:

    - Increasing pay for tutors
    - Academic credit for peer instruction coursework.

    Both of these are likely to be supported through the development of the proposed Math and Science Learning Center.

II B. The Quality of the Curriculum Supporting the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of the curriculum supporting the program as "satisfactory" because of the strong relationship between the curriculum and the program outcomes.

- **Describe the relationship between the program's curriculum and its outcomes**

Relationship between the program's curriculum and its outcomes

The programs are designed to produce graduates with a solid foundation in calculus, linear algebra, probability and statistics, and real analysis, as well as some knowledge in other areas of mathematics. The primary goal of our curriculum is to build mathematical knowledge and to develop habits of mind of a mathematical thinker. In the list below, program outcomes are matched with required courses that are found in some baccalaureate degrees. Such common experience guarantees that students meet program expectations.

Statement of expected outcomes

At graduation, CSU Mathematics majors will have:

- An understanding of calculus and an ability to use calculus in applications
  - MATH 1131 Calculus/Analytical Geometry 1
  - MATH 1132 Calculus/Analytical Geometry 2
  - MATH 2135 Calculus/Analytical Geometry 3
- Knowledge of algebraic structures
  - MATH 2115 Introduction to Linear Algebra
  - MATH 5111 Introduction to Abstract Algebra 1
- Knowledge of the real numbers, functions, the topological properties of **R**, differentiation, and integration
  - MATH 5151 Introduction to Real Analysis 1
- Knowledge of and ability to apply probability density functions
  - MATH 3175 Introduction to Probability
  - MATH 5175 Mathematical Statistics
- Knowledge of appropriate mathematical models
  - MATH 1131 Calculus w/Analytical Geometry 1 (position, velocity & acceleration; exponential growth & decay)
  - MATH 1132 Calculus w/Analytical Geometry 2 (work; more re. position, velocity & acceleration)
- The ability to think critically
  - All mathematics courses
  - MATH 4795 Senior Seminar in Mathematics
- The ability to understand mathematical arguments and to construct mathematical proofs
  - MATH 3155 Foundations of Adv. Math
  - MATH 5111 Introduction to Abstract Algebra 1
  - MATH 5151 Introduction to Real Analysis 1
- The ability to use computational devices and software in problem solving situations

  - MATH 1165 Computer-Assisted Problem Solving
- Communication skills to acquire, develop and convey mathematical knowledge
  - MATH 3155 Foundations of Adv. Math
  - MATH 4795 Senior Seminar in Mathematics
  - MATH 5111 Introduction to Abstract Algebra 1
  - MATH 5151 Introduction to Real Analysis 1

- **Indicate how technological skills are incorporated into the program of study**

Incorporation of technological skills into the program of study

All Mathematics programs require at least some exposure to the use of technology in mathematics through the course MATH 1165 Computer Assisted Problem Solving. The Mathematics faculty makes judicious use of appropriate technology in many other courses. Students in our program use a variety of mathematical software tools. These include, but are not limited to, Excel, Minitab, Maple, and Geometer's Sketchpad. Students have also given "Power Point" presentations in the senior seminar course.

- **Indicate how the program is relevant to student needs**

Relevance of the program to student needs

The Department of Mathematics offers the Bachelor of Arts (BA) in Mathematics; the BA in Mathematics and Secondary Education; the Bachelor of Science (BS) in Mathematics; and The Bachelor of Science in Mathematics, Applied Mathematics Concentration. These programs are designed to produce graduates with a solid foundation in calculus, linear algebra, probability, statistics, and real analysis, as well as some knowledge in other areas of mathematics. Graduates of all Mathematics programs have the ability to solve problems creatively and effectively, to reason logically, and to apply mathematical skills and to use modern technology in positions in industry or the professions, or to continue their studies at the graduate level.

The BA programs offer a broad exposure to mathematics within a program of study that adheres to the recommendations of the Conference Board of the Mathematical Sciences for the mathematical preparation of secondary Mathematics teachers. Students in these programs also will find a suitable preparation for graduate studies in mathematics. Those who wish to teach high school may choose the BA and Secondary Education for an established path through a four-year baccalaureate program leading to recognition by the Professional Standards Commission required for teaching certification in Georgia. Our BA and Secondary Education is one of only six baccalaureate programs in the University System of Georgia leading to certification at the secondary level in mathematics.

The BS program offers our most extensive exposure to theoretical mathematics, with two full semesters of abstract algebra, two semesters of real analysis, and a course in ordinary differential equations. This would normally be the first program recommended to students seeking to pursue graduate studies in pure mathematics.

The Applied Mathematics Concentration serves students who wish to pursue a career in industry or government upon graduation. Students choose from an actuarial track and a statistics track. The actuarial mathematics track aims to provide the mathematical preparation necessary for strong students to pass two Society of Actuaries Exams; this is the usual expectation for initial employment in the actuary profession. Actuary track students are encouraged to pick up additional course work in accounting, business administration, and finance; we expect graduates of this program to find employment opportunities in banking and finance.

Students in the statistics track are prepared to perform statistical analyses in a variety of situations and are well prepared for graduate study in statistics.

- **Describe how students are challenged to think across disciplines**

Challenging students to think across disciplines

For all students receiving a baccalaureate degree in mathematics, a common experience of the following foundation courses is required in Area F:

- MATH 1131 Calculus/Analytical Geometry 1
- MATH 1132 Calculus/Analytical Geometry 2
- MATH 2135 Calculus/Analytical Geometry 3
- MATH 2115 Introduction to Linear Algebra
- MATH 1165 Computer-Assisted Problem Solving

and in Area G:

- MATH 3155 Foundations of Adv. Math
- MATH 3175 Introduction to Probability
- MATH 4795 Senior Seminar in Mathematics
- MATH 5151 Introduction to Real Analysis 1
- MATH 5175 Mathematical Statistics

These foundation courses guarantee a common understanding of mathematical concepts from a theoretical perspective. Incidental exposure to applications in physics are likely to occur in the calculus sequence; however this is the extent to which all students are regularly confronted with issues in other disciplines.

- **Explain how diversity, multiculturalism, and international perspectives are included in the program**

Inclusion of diversity, multiculturalism and international perspectives in the program

Opportunities for exposure to issues in diversity, multiculturalism, and international perspectives are expected experiences for students majoring in either the BA in Mathematics or the BA in Mathematics and Secondary Education. These opportunities come from this required course:

- MATH 5185 History of Mathematics

- **Describe methods to be pursued for program improvement.**

1. We need to differentiate program outcomes for all of our degrees and all of our tracks

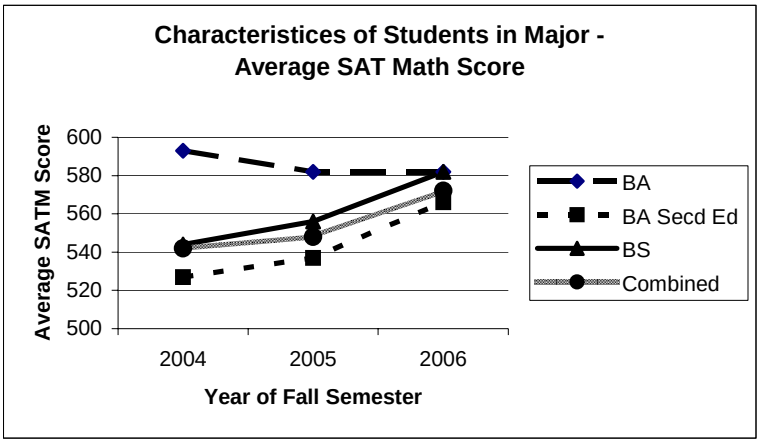
II C. Selectivity, Academic Achievement, and Satisfaction of Students in the Program

State your assessment of the strength of the evidence of program quality on this indicator.

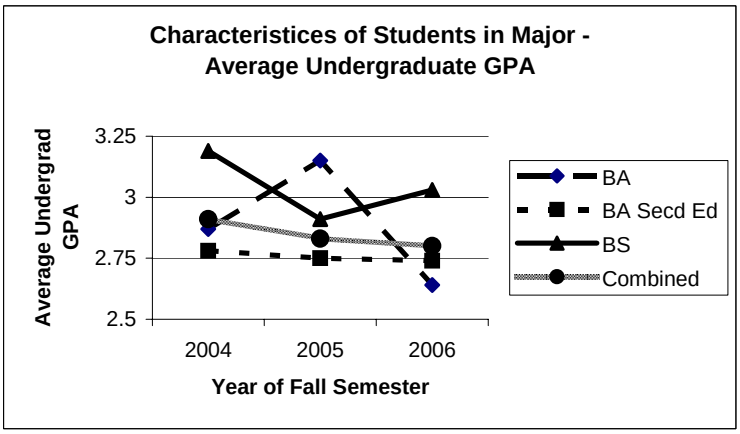
We rate the selectivity, academic achievement, and satisfaction of students in the program as "above average," particularly because of scores on national assessment exams and by the number of placements of our graduates in secondary educations positions, actuarial positions, and postgraduate studies.

- **Describe the characteristics of students in the program (i.e., test scores, overall GPA, retention rates)**

The following chart points to increasingly stronger majors in all segments of the program with the exception of the BA; however, student interest in that program is waning and the number of students currently involved is less than a handful.



As the next diagram shows, there is no observable trend for the average undergraduate GPA for our majors. The value of this characteristic of our students is probably not significant, as it would appear that the mean GPA of the (relatively small) pool of students measured each fall would be greatly influenced by changes in the pool, i.e. departure of graduating seniors, and the addition of sophomores and some freshmen.



Total retention rates for our program described in the table below match reasonably well with those of our institution. However, a careful analysis of the Fall 2005 cohort in Mathematics reveals the following situations:

- There were 9 freshman Mathematics majors in fall 05, two of which were not first time freshmen (both returned in fall 06).
- Of the 9 freshmen,
  - 2 students never took a Mathematics course at CSU and didn't return in fall 06
  - 1 student made an A in MATH1131 but didn't return. This student has a TOEFL score on record – might have returned to home country
  - 1 student withdrew passing from all courses and did not return to CSU
  - 1 student came in with a 450 SATM. This student's overall gpa is 1.00. The student did not return in fall 06
  - 1 student who did not return in fall 06 has since returned and is currently taking MATH1131, MATH 1165, and MATH 2115. *Counting this student as a return brings the overall return rate to 64%.*

Retention Rates by Undergraduate Major Program (*)

Major Program	Number in Fall 2004 Cohort	Fall 2004 Cohort Returning Fall 2005		Number in Fall 2005 Cohort	Fall 2005 Cohort Returning Fall 2006	
		Number	Rate		Number	Rate
Mathematics	6	5	83.3%	8	3	37.5%
Math & Secd Ed	8	6	75.0%	3	3	100.0%
Total Math	14	11	78.6%	11	6	54.5%
Total Bac CSU	652	479	73.5%	768	536	69.8%

* The cohorts above are first-time full-time undergraduate students enrolled fall semester who entered CSU in the fall or the preceding summer term. Students in Certificate Programs are not included in Freshmen Cohort.

- **Describe student learning, satisfaction and evidence of success in meeting student needs and learning outcomes as reflected by major field assessment**

We have the following comments taken from essays collected from 6 students in the Senior Seminar course in fall 06:

1. "I feel that CSU has given me the tools to achieve may goals. Though I won't take the actuary exams until I'm almost finished at CSU, I have the knowledge I need to prepare for them. Though I feel that I've spend more time doing the theoretical aspect of math instead of working on applied classes, I do think that I've found a nice balance between the two. Overall, I feel that CSU has provided me with what I need to create and change my goals."

2. "There are many other details, but the main point is that even though I have had to make numerous adjustments along the way, my major goals are being realized. I feel that I have gained a well-rounded mathematics education through hard work and good instruction. … As I look toward a future career, I feel I am armed with the necessary tools to be successful…"

3. "…I have a desire to become better and more fluent in the mathematics which I have already taken. I want my math skills to become second nature and intuitive. But I am unsure if I am capable of graduate mathematics work, if the difficulty level higher than that of which I am able to master."

4. "I must confess I did not have extremely high hopes for the mathematics program at CSU when I first came on board three years ago. Columbus State doe not have a large mathematics program, and it certainly did not when I entered CSU. However, throughout my college career, I have noticed great improvements and expansion in the mathematics department. The addition of the Applied Mathematics major with a concentration in actuarial mathematics or statistics is a perfect example of how the math department is expanding for the students. The department has gone above and beyond my expectations of a minimal education… I can see many more improvements in years to come with the addition of a graduate program and several qualified professors. I am one hundred percent satisfied with my education at CSU.

5. "When I earn my degree in Secondary Mathematics, I will have the mathematics experience to help me in the classroom. Even if I have to go back and refresh my memory, I will be able to reconnect what I used to know to all the math knowledge I currently know. This will help me as a teacher and to be prepared to explain to students how and why problems work…"

6. "After completing my degree, I will have a better understanding of how equations and formulas work, and also proofs. I understand that math is not all formulas and proofs while only being interested in the formulas. I have definitely reached my goal of completing a challenging degree and understanding the concepts of mathematics better than when I first started my degree."

- **Describe methods to be pursued for program improvement.**

1. Seeing that several of the first time, full time freshmen in the fall 2005 cohort never even took a Mathematics course at CSU, and seeing that first semester freshmen sometimes choose Mathematics as a major based on nonacademic considerations and without informed recommendations from faculty, we will investigate the availability of automated data collection tools that will allow us to
    a. early in the fall semester identify potentially at-risk first semester freshmen who have declared Mathematics as a major, and conduct follow up conferences with each to evaluate likelihood of success in the major, and

    b. identify those first semester freshmen majors who have not enrolled in Mathematics courses or who have enrolled but dropped; follow up conferences will help these students assess their interest in the major.

2. Identify ways to survey student satisfaction with the program in Senior Seminar that ensure anonymity, reliability, and candor.

II D. The Quality of Faculty Supporting the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of faculty supporting the program as "above average," particularly because of quantity and quality of professional activities, especially publications and paper presentations. These accomplishments have occurred in a subject matter area that has long had the reputation for being a difficult one in which to be productive. Furthermore, this faculty is academically diverse, which contributes to a wide availability of areas of study for our students.

- **Describe the adequacy of faculty and staff to support the program (locations of graduate training, post-graduate training, specializations, secondary fields)**

Faculty Having Appropriate Interest, Experience, Training, Graduate Education, or Post Graduate Studies to Teach Courses Supporting the Program

COURSE	FACULTY (in alphabetical order)
Computer-Assisted Problem Solving	Howard, Ionascu, Linton
Introduction to Linear Algebra	Almada, Bhandary, Dai, Deng, Howard, Ionascu, Linton, Stancu, Tu
Introduction to Discrete Math	Howard, Ionascu, Muse, Stancu
Mathematical Theory of Interest	Linton, Muse
Differential Equations	Almada, Deng, Ionascu, Howard
Introduction to Actuarial Science	Linton, Muse
Foundations for Advance Mathematics	Almada, Bhandary, Dai, Deng, Howard, Ionascu, Linton, Tu
Introduction to Probability	Almada, Bhandary, Dai, Ionascu, Linton, Tu
Senior Seminar in Mathematics	Almada, Deng, Howard, Ionascu, Stancu
Introduction to Abstract Algebra I	Almada, Ionascu, Linton, Stancu
Introduction to Abstract Algebra II	Almada, Ionascu, Linton, Stancu
Applied Nonparametric Methods	Bhandary, Dai, Tu
Applied Categorical Data Analysis	Bhandary, Dai, Tu
Actuarial Mathematics I	Linton, Muse
Actuarial Mathematics II	Linton, Muse
College Geometry	Fouche, Henning, Ionascu, Stancu
Introduction to Real Analysis I	Almada, Deng, Ionascu, Howard, Stancu
Introduction to Real Analysis II	Almada, Deng, Ionascu, Howard, Stancu
Mathematical Statistics	Bhandary, Dai, Ionascu, Linton, Muse, Tu
History of Mathematics	Fouche, Henning, Ionascu

- **Describe the support provided for faculty development**

Faculty making presentations at professional conferences continue to find funding for travel, room and board. Funding sources include a departmental budget ($5,500 total for faculty), department Foundation

account, dean's budget, and Faculty Development funds the PRISM grant funds. In the past five years, every faculty member who presented at a conference or meeting had her/his travel expenses fully funded.

Renjin Tu turned institutional support for one-semester's sabbatical into a one year experience at UCLA (by covering her own expenses for the second semester). Both she (twice), Baiqiao Deng (twice), Tim Howard and Eugen Ionascu have participated in the Faculty Development Program at Georgia Tech.

Three of our current faculty, Cindy Henning, Tim Howard and Brian Muse have participated in Project NExT (New Experiences in Teaching), a professional development program of the Mathematical Association of America for new or recent Ph.D.s in the mathematical sciences.

- **Show faculty diversity and credentials**

	Program Faculty Diversity			
	2004-2005	2005-2006	2006-2007	2007-2008
Total Program Faculty	9	8	11	12
Male (% male)	6 (67%)	6 (75%)	7 (64%)	8 (67%)
Female (% female)	3 (33%)	2 (25%)	4 (36%)	4 (33%)
American Indian	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Asian	2 (22%)	2 (25%)	4 (36%)	4 (33%)
Black	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Hispanic	1 (11%)	1 (13%)	1 (9%)	1 (8%)
Multi-racial	0 (0%)	0 (0%)	0 (0%)	0 (0%)
White	6 (67%)	5 (63%)	6 (55%)	7 (58%)

Program Faculty Credentials

Dr. Carlos Almada
Associate Professor of Mathematics
Ph.D. Mathematics, University of Colorado at Boulder

Dr. Madhusudan Bhandary
Associate Professor of Mathematics
Ph.D. Statistics, University of Pittsburgh

Dr. Hongying Dai
Assistant Professor of Mathematics
Ph.D. Statistics, University of Kentucky

Dr. Baiqiao Deng
Professor of Mathematics
Ph.D. Mathematics, University of South Carolina

Dr. Katheryn Fouche
Professor of Mathematics
Ed.D. Mathematics Education, University of Florida

Dr. Cindy Henning
Associate Professor of Mathematics
Ph.D. Mathematics Education, Auburn University

Dr. Tim Howard
Professor of Mathematics
Ph.D. Mathematics, Georgia Institute of Technology

Dr. Eugen Ionascu
Associate Professor of Mathematics
Ph.D. Mathematics, Texas A&M University

Dr. Ron Linton
Professor of Mathematics
Ph.D. Mathematics, Vanderbilt University

Dr. Brian Muse
Assistant Professor of Mathematics
Ph.D. Mathematics, Auburn University

Dr. Alin Stancu
Assistant Professor of Mathematics
Ph.D. Mathematics, SUNY Buffalo

Dr. Renjin Tu
Professor of Mathematics
Ph.D. Statistics, The Wichita State University

- **Describe how part-time faculty are integrated into the program**

Part-time Faculty

- have the opportunity to participate in discussions during departmental faculty meetings, purposely scheduled at a time that is likely convenient to them.
- minutes from departmental faculty meetings and some committee meetings are posted on the department website so part time faculty members who can't attend can remain aware of our discussions
- are invited to participate in summer workshops covering core mathematics curriculum
- are invited to participate in a workshop conducted by Academic Affairs dealing with procedural and legal issues

- **Describe methods to be pursued for program improvement.**

1. We need to investigate methods for expanding teaching opportunities for full-time, nontenure-track faculty. Perhaps we could establish an internal "continuing education" program for interested faculty who would formally audit higher level courses as a preparation to move into other courses. For example, after successfully auditing Calc I, Calc II, and (maybe) Calc III, a faculty member could then request to teach Calc I. Faculty would be given a one course reduction in teaching during each semester in which they were auditing a course. Formal auditing should be considered as Professional Development for annual reviews.

2. We need to create well-defined opportunities for full-time, nontenure-track faculty to return to graduate school to pursue the PhD. Such a program should include reduced teaching load while taking courses. Financial support should be identified, and procedures for applying for participation in such a program should be streamlined.

II E. The Quality of Facilities and Equipment Supporting the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of facilities and equipment supporting the program as "satisfactory."

- **Describe the condition and adequacy of available space**

As a department, we have run out of office space. However, over the upcoming semester break, we anticipate moving to renovated offices and classrooms on the second floor of the Fine Arts Hall. We presently occupy 19 faculty offices, three of which are physically separated from the rest of the department. We have plans to grow; to meet projections for growth in university enrollment, we estimate a need for 5-8 additional mathematics faculty members. We anticipate FAH satisfying our growth needs for some time to come.

Classroom availability is getting tight at most times of the day. We control seven classrooms, which are fully utilized during several morning time slots and the 6 p.m. slots. However, we gain two more classrooms in FAH.

- **Describe the condition and adequacy of technology labs, equipment, and library resources**

Generally speaking, labs and equipment are satisfactory; however we see a growing demand for SAS coming from students, faculty, and members of the campus and local community. The room design of our computer lab is inadequate: Although the room seats 30 students, a column obscures the view of the front board / projection screen from 5-8 of the seats. In addition, the layout of the lab does not support group work.

Through Inter-library loan and online journal access we have very good access to journals

- **Provide other indicators of adequacy of campus infrastructure to support the program**

Building, classroom, and campus networking facilities easily meet faculty and student needs. Technical support from CINS is excellent.

- **Describe methods to be pursued for program improvement.**

1. We propose to move the Math Computer Lab to FAH and to provide faculty/student access to the Lab as a teaching classroom during times when the room is not scheduled for computer usage.

II F. The Quality of Research and Scholarship Supporting the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of research and scholarship supporting the program as "above average," particularly because of substantial student success in special research projects with faculty, resulting in student presentations in colloquia and regional conferences, and research papers written. In addition, we note the quantity and quality of professional activities, especially publications and paper presentations. These accomplishments have occurred in a subject matter area that has long had the reputation for being a difficult one in which to be productive.

- **Explain how faculty involve students in research**

Student Involvement in Research

Students' research involvement is optional and has come through several avenues:

- **Extra-curricular exploration.** Laura Nunley has worked with Dr. Almada on three separate projects. These projects bore no course credit but did result in public presentations of her work. Mike McCoy worked on the Prisoner/Guard problem with Dr. Ionascu, wrote a computer program to help solve the problem. Dr. Almada also helped Melinda Pell, a graduate of our baccalaureate program, with her masters thesis work while she was a graduate student at Auburn University. She successfully defended her thesis about a year ago.
- **Honors contracts.** Honors student Sandra Gaskins completed research projects in probability and algebraic semi-group theory under the supervision of Drs. Linton and Muse. Angela Williams worked on a statistics based Honors project with Dr. Fouche. The projects were completed in fulfillment of Honors Contracts required in the CSU Honors Program.
- **Special courses.** Three students – Jennifer Close, Sandra Gaskins, and Rebecca Klusmeier participated in a special topics course with Dr. Linton in which they researched applied probability and algebraic semi-group theory. All wrote papers summarizing their findings.
- **Honors Thesis.** For her Honors Program thesis, Sandra Gaskins chose to extend her work on algebraic semi-group theory.

As a direct consequence of Laura Nunley's involvement in "undergraduate research" here at CSU she was selected to participate in an REU experience at Auburn University during the summer 2007. At a recent CSU Mathematics and Statistics Colloquium, she presented some of the original work she completed during the summer REU. She is now in the process of applying for graduate school in Mathematics at UGA and AU.

- **Describe how faculty research relates to the program mission**

Faculty Research and Its Relation to the Program Mission

Faculty involvement with original research enables them to stay current in their areas of specialization and to hone the creativity and problem solving skills we seek to develop in our students. Faculty members serve as consultants for the university community and for the external community. Recent work includes the following:

- Assisting Environmental Science students with their master's degree research
- Supporting research by CSU faculty working on their doctorates
- Guiding a research program for the Muscogee County Department of Corrections
- Serving as statistics consultants on multiple papers by researchers at the Hughston Sports Clinic

All of these experiences enhance the authority of our faculty in the classroom and give them the perspective to stimulate students' interest in a life of engagement in math and statistics.

Continued professional development of faculty via research also pays dividends in attracting superior students at Columbus High School to our advanced courses. These "brightest" students find substantial challenge from members of our active faculty and leave our courses with a substantial intellectual experience with advanced mathematics. Our courses and faculty have drawn dual enrollment students who have already been admitted to institutions with strong reputations: MIT (3 students), GATech (1 student), and UGA (3 students).

- **Describe mentoring and professional development opportunities for faculty**

Mentoring and Professional Development Opportunities for Faculty

We normally assign a faculty mentor for newly hired faculty. The mentor offers advice, reviews course materials (syllabi, class schedules, tests, etc.), and observes the teaching of the junior faculty member.

All eligible new faculty members are encouraged to participate in Project NExT, a professional development program for new Mathematics faculty sponsored by the Mathematical Association of America. The Mathematics Department and the dean of the College of Science have defrayed travel expenses to enable this opportunity. Both Cindy Henning and Brian Muse have recently participated in this program.

- **List faculty publications, papers given, and public lectures**

The lists of achievements of our faculty in these areas are extensive. The reader is referred to Appendix 2 for Publications, Work in Progress, Papers Presented, and Public Lectures.

- **Describe methods to be pursued for program improvement.**

1. Investigate ways to credit faculty teaching loads for time spent supervising undergraduate research.
2. Identify ways to provide faculty with opportunities for release time to conduct research.

II G. The Quality of Service Supporting the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of service supporting the program as "satisfactory."

- **Describe projects completed and outcomes which contribute to the program, department, college, institution, community, and/or the region**

A partial list of projects directly contributing to the institution include

1. implementation of the Mathematics placement system,
2. statistical consulting by statistics faculty on campus (and in the community), and
3. service on Mathematics education program advisory committee for COE.

Contributions to the community and/or region include

1. hosting the annual CSU Mathematics tournament,
2. supporting the American Mathematics Competition,
3. sustained involvement with Science Olympiad and Math Counts over the years
4. development of geometry task items for the 7th grade Georgia Performance Standards, and
5. enrichment activity at Blackmon Road Middle School conducted by a mathematics faculty member.

- **Describe methods to be pursued for program improvement.**

1. We will sponsor a team for the Putnam Competition.
2. We will participate in the Early College Visitation activities in the Fall semester.

II H. Program Honors & Awards

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the quality of program honors and awards as "satisfactory."

- **Identify the formal honors, awards, high rankings, citations of excellence, accreditations, positive external reviews, etc. that this degree program has received over the last seven years.**

  - A positive Comprehensive Program Review in 2003.

- **If program accreditation is available but has not been attained at CSU, explain why.**

    - The BA in Secondary Education has been awarded NCATE accreditation; accreditation is not available for other degrees in the program.

II I. Exceptional Achievements & Honors of the Program's Students, Graduates, & Faculty

We rate the quality of achievements and honors of the program's students, graduates and faculty as "satisfactory."

State your assessment of the strength of the evidence of program quality on this indicator.

- **Identify the exceptional achievements and honors received by the program's students, graduates, and faculty over the past five years which reflect on the quality of the program.**

Dr. Eugen Ionascu recently received an award from Romania: Honorific Member of the Romanian Institute of Mathematics ``Simion Stoilow" In addition, he was a recent finalist for the CSU Faculty Research Award. Cindy Henning was a recent finalist for the CSU Faculty Service Award.

II J. General Success of the Program's Graduates

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the general success of the program's graduates as "above average," particularly because of the high degree of success of Mathematics Education students on the PRAXIS II and GACE exams. In addition, the Actuarial Track of the BA in Applied Mathematics, created in part as a result of student suggestions, has produced a collection of graduates having the distinction that three have already taken actuarial positions.

- **Report the results of the department's assessments of the general success of the program's graduates such as licensure or certification rates, job offers, job placement statistics, average salaries, subsequent career advancement, test scores, admissions to post-baccalaureate programs, etc.**

1. Three students (Jennifer Close, Bruce Kelly, and Andrew Smith) have accepted actuarial positions; Jennifer passed the first SOA exam just before graduation and then passed her second exam within the past three months.

2. Six students (Angel Gaskins, Leslie Hammock, Mary Yancey, Anna Denson, and Troy Bartlett) have accepted positions as high school teachers of mathematics in Muscogee County.

3. Three of our recent graduates (Melinda Pell, Gina Greiwe, Jeff Barron) have earned masters degrees; another (Michael Lynch) was recently accepted to graduate school.

4. We have seen sustained positive performance on the Major Fields Assessment Test in Mathematics:

Major Fields Assessment Test Performance			
	2004/05	2005/06	2006/07
Number Participating	4	5	7
Number Scoring Above Nt'l Median	2	3	4
Percent Scoring Above Nt'l Median	50%	60%	57%

5. We have begun to collect data on student performance on the PRAXIS II / GACE exams: in 2006, 2 out of 2 and 2 out of 3 students passed these exams, respectively.

II K. Stakeholder Satisfaction with the Program

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the stakeholder satisfaction with the program as "satisfactory."

- **Report the results of surveys of students, alumni, employers, community partners, etc. concerning their satisfaction with the quality of the program and its learning experiences and any program improvements initiated as a function of such feedback over time.**

These actions were taken, in part, because of feedback from a January, 2002 survey of 45 graduates of our program (with only 4 responding): an Actuarial Track in the BS degree, an Applied Statistics Track in the BS degree, a new course, MATH 1165, Computational Methods in Problem Solving utilizing Excel and Maple.

In a recent survey, 100% of the 9 secondary education students who responded agreed that the courses they took in their program helped prepare them for their career and they were employed as teachers. The Department has incorporated the survey instrument as an ongoing method for feedback that can be used to guide program decisions. Other recent attempts at surveying student interests have seen few responses. In Spring of 2005, an Exit Survey was distributed to the 7 students enrolled in the Senior Projects Course. Comments from those students have been described above in section II C.

At this time, we do not conduct surveys of employers or community partners.

- **Also comment on the effectiveness of the program's use of a community advisory board.**

The Mathematics Education Advisory Committee meets twice a year. Feedback from that committee has helped us identify the foreign language requirement as an impediment for students who might otherwise consider the BA in Mathematics and Secondary Education.

II L. Program's Responsiveness to Change & Improvement

State your assessment of the strength of the evidence of program quality on this indicator.

We rate the program's responsiveness to change and improvement as "very strong," particularly because we have carefully considered student suggestions for improvement, implementing two new tracks and a new minor as a result. Likewise, we have thoughtfully reviewed new expectations of the CBMS, designing a baccalaureate program in mathematics that leads to certification at the secondary level in mathematics.

- **Cite the most significant examples of improvements made in the program over the last seven years in response to changing conditions, new external requirements, and/or departmental assessment initiatives.**

- As a result of the previous CPR, we reduced the number of required math hours in all programs
- Developed the two tracks in the applied mathematics program
- Developed a Secondary Education program that complies with CBMS recommendations and can be managed in four years
- Adjusted terms in which abstract algebra courses are to be offered, which we expect to have the following benefits:
    - reduce the intensity of the load on students
    - increasing schedule flexibility for students (increases likelihood of students' changing major to math)
    - shortening the time elapsed between Foundations and a proof-oriented upper level course
- Relaxed the pre-requisite for linear algebra (made calc a co-req instead of a pre-req)
- Adjusted the expected student workload in senior seminar (we agreed that comprehensive problem sets and a major expository project were too much)
- Created an undergraduate research course
- Changed the CPSC 1301 requirement to MATH 1165
- Instituted a math placement test to
    - improve students' chances of success in core Mathematics courses
    - enhance the learning environment in core Mathematics courses
    - better prepare students for subsequent studies in mathematics
- Adjusted the MATH1111 final exam construction
    - Posting previous exams on the web
    - Soliciting the involvement of all instructors in the design of the final
    - Circulating an outline of the final exam shortly before the exam day
- Created a Minor in Applied Statistics

- **Comment on how frequently the program's faculty is engaged in program assessment activities, comprehensive program evaluations, and fine tuning of the program and its requirements.**

These processes occur annually.

III. Summary Findings of the Program's Overall Productivity

Repeat the summary conclusion about the strength of the program's overall productivity as reported in the executive summary and cite any additional detailed analyses, interpretations, or rationale that support this summary judgment. This summary conclusion should be consistent with the pattern of strengths and weaknesses observed among the indicators of program productivity that follow.

Data collected and analyzed point to a program having an overall productivity of "satisfactory":

Meeting expectations: Collected data shows an increasing number of majors along with a stable rate of upper level enrollment (majors) as a percentage of that of the institution. Similarly, the number of degrees conferred is rising as is the rate of degrees conferred as compared to that of CSU. Except for a portion of one cohort (analyzed in detail later in the report), six-year graduation rates meet or exceed those of our campus.

We accommodate student needs by scheduling all required courses at least once per year, and, reflecting the increase in the number of majors, we have seen sustained enrollment in required courses. We have controlled reasonably well the offering of specialized electives that serve only a small segment of our student population.

While the number of black students majoring in mathematics has risen over the past three years as has the number of majors, the percentage of black students in the major has declined. At the same time, the percentage of black undergraduates at CSU has increased. The percentage of female majors has increased compared to the total number of mathematics majors, while the percentage of female undergraduates has remained the same campus wide. The number of baccalaureate degrees in mathematics awarded in each of the last three fiscal years matches or exceeds that of almost all of the USG state universities lying outside of the greater Atlanta area.

Exceeding expectations: There are several emerging trends that suggest increasing productivity of our curriculum.

- *First*, both the number of upper division majors and the number of degrees conferred, considered as a percentage of comparable institutional numbers, have risen over the past three years.

- *Second*, the number of students enrolling in a key-indicator, upper division course, Foundations for Advanced Mathematics, has increased so much that we now offer two sections per year, as opposed to one.

- *Third*, our department continues to be a low-cost producer when compared to the institutional average.

Methods for improving program quality:

1. Because of low enrollments in several of the statistics courses supporting the Statistics Track of the BS in Applied Mathematics we will adjust the prerequisites for those courses. Instead of requiring MATH 1127, MATH 1131, MATH 1132, and MATH 3175 we will only require only MATH 1127 and Statistical Computing. This change should draw more students to the major.

2. Because of the foreign language requirement for all BA degrees, and because of the apparent negative effect that requirement has had on the number of students majoring in the BA in Mathematics and Secondary Education, we will modify the program, changing the degree to the BS in Mathematics and Secondary Education.

3. We will seek ways to recruit minority students and faculty.

4. We will seek ways to increase retention among minority students by analyzing impediments to student success.

5. Because of the relatively small numbers in some of these cohorts, we plan to investigate in the Fall of 2008, the success of the 2002 cohort.

6. Seeing that first semester freshmen sometimes choose Mathematics as a major based on nonacademic considerations and without informed recommendations from faculty, we will investigate the availability of automated data collection tools that will allow us to

   a) early in the fall semester identify potentially at-risk first semester freshmen who have declared Mathematics as a major, and conduct follow up conferences with each to evaluate likelihood of success in the major, and

   b) identify those first semester freshmen majors who have not enrolled in Mathematics courses or who have enrolled but dropped; follow up conferences will help these students assess their interest in the major.

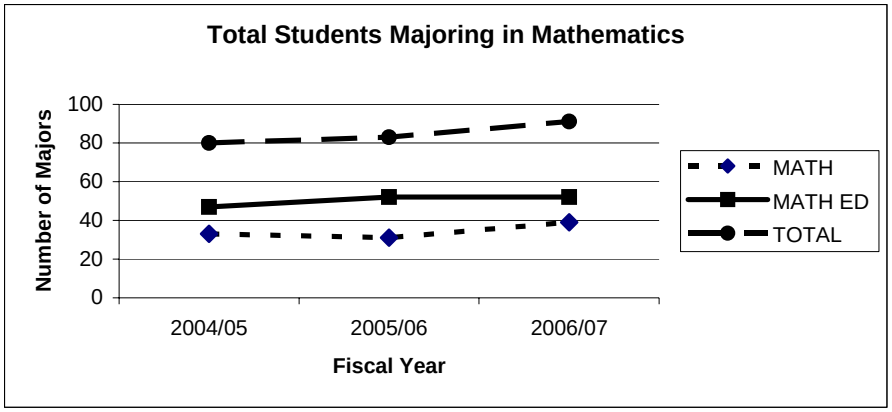
III A. Enrollment of Students in the Program

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the enrollment of students in the program as "satisfactory." Collected data shows an increasing number of majors along with a stable rate of upper level enrollment as a percentage of that of the institution.

- **Analyze and interpret the numbers of majors enrolled in the program and the enrollment trends of these majors for the past five years.**

  The chart below shows continued growth in the total number of students majoring in mathematics. This is also evidenced by the fact that enrollment has grown enough in MATH 3155, Mathematical Foundations course (required of all majors) that we now offer one section in the Fall and one in the Spring.



Total Number of Students Majoring in Mathematics by Program - Fall Semesters

- **For undergraduate programs, compare the strength of the numbers of the upper division majors and enrollment trends for this program with the enrollments and trends of upper division declared majors in other undergraduate programs at CSU.**

The following table demonstrates a slight increase in the percentage of upper division students majoring in mathematics for our programs as compared to the same numbers for our institution.

	2004/05	2005/06	2006/07
Mathematics	15	16	19
Math & Secd Ed	21	22	23
Total	36	38	42
Pcnt of CSU Tot	1.51%	1.50%	1.54%

Upper Division Mathematics Enrollments by Major Program

- **For graduate programs, compare the strength of the numbers and enrollment trends for this program with the enrollments and trends of in other graduate programs at CSU.**

N/A

- **Describe methods to be pursued for program improvement.**

1. Because of low enrollments in several of the statistics courses supporting the Statistics Track of the BS in Applied Mathematics, we will modify prerequisites for those courses, and require only Statistical Computing. This change should draw more students to the major.

2. Because of the foreign language requirement for all BA degrees, and because of the apparent negative effect that requirement has had on the number of students majoring in the BA in Mathematics Education, we will modify the program, changing the degree to the BS in Mathematics Education.

III B. Annual Degree Productivity of the Program

State your assessment of the strength of the evidence of program productivity on this indicator.

The National Center for Education Statistics estimates the number of bachelor's degrees awarded in the United States in the 2006-2007 academic year based on survey results – see Table 261 at http://nces.ed.gov/programs/digest/2007menu_tables.asp. In that year, NCES estimates that United States institutions granted a total of 1,485,242 bachelor's degrees in all fields combined, while granting 14,770 (0.99%) bachelor's degrees in mathematics and statistics. At Columbus State University, we did slightly better than this, with mathematics comprising 1.07% of all bachelor's degrees awarded that year; we improved our rate to 1.50% in 2006-2007. Considering this information, and given that

1. the number of mathematics degrees conferred at CSU is rising, and
2. the proportion of CSU degrees awarded in mathematics is rising,

we rate the annual degree productivity of the CSU mathematics program as "satisfactory".

- **Analyze and interpret the numbers of degrees granted annually (fiscal year) by this program and the trends of the program's degree productivity over the past five years.**

  The following table demonstrates an increasing trend in the total number of mathematics degrees conferred. It should be noted that the BA in Mathematics has essentially been an inactive program, preserved in anticipation of changes in the way secondary education students are prepared. The BA in Mathematics and Secondary Education essentially replaced that program.

	2004/05	**2005/06**	**2006/07**
BA Mathematics	1	0	0
BA Math & Secondary Education	3	3	5
BS Math	4	4	5
Total degrees conferred	**8**	**7**	**10**

Number of Degrees Conferred - Fiscal Year

  The growth in the number of degrees conferred is expected to continue as enrollment levels in two bell weather courses – Foundations for Advanced Mathematics (MATH 3155) and Senior Seminar (MATH 4795) – foretell. Senior seminar enrollments have swelled from 4 to 7 students per year during this three-year period, and jumped all the way to 14 students in 2007-2008. Due to increased enrollments in Foundations, the course frequency had to be increased from once per year to twice per year; annual enrollments in the class rose from 16 in 2004-2005 to 28 in 2006-2007. All students in all mathematics programs must take these two courses, so they serve as reliable indicators of upcoming graduation rates.

- **Compare the strength of the degree productivity of this program with the productivity of other programs at CSU.**

  The following table suggests continued growth in number of degrees conferred in our program. Again, the difference of one degree this way or that can have a substantial effect on percentage of overall number conferred. However, the trend is positive rather than negative.

	2004/05	2005/06	2006/07
Combined	8	7	10
CSU Total	585	655	667
%CSU Total	1.37%	1.07%	1.50%

Percentage of CSU Total Degrees Conferred - Fiscal Year

- **Describe methods to be pursued for program improvement.**

1. We will take up this issue in our annual assessment process.

III C. Program Completion Efficiency & Graduation Rate

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the program completion efficiency and graduation rate of the program as "satisfactory" because, except for a portion of one cohort analyzed below, six-year graduation rates meet or exceed those of our campus.

- **Analyze and interpret the program's graduation rate.**

	Number in	Fall 2000 Cohort		Number in	Fall 2001 Cohort	
Major Program	Fall 2000	Graduating by 2006		Fall 2001	Graduating by 2007	
	Cohort	Number	Rate	Cohort	Number	Rate
Baccalaureate						
Mathematics	3	2	66.7%	6	0	0.0%
Math & Secnd Ed	2	1	50.0%	5	2	40.0%
Total Program	5	3	60.0%	11	2	18.2%
Total CSU Baccalaureate	478	172	36.0%	494	199	40.3%

Six-Year Graduation Rates by Undergraduate Major Program[†]

With relatively small numbers, success of one or two students can make a substantial difference in average rates. Except for the 2001 cohort (which we describe below), our program graduation rates match or exceed those of the institution as a whole. We are concerned that some incoming freshmen are selecting academic majors without informed guidance from faculty.

(Note: we have investigated the anticipated success of the 2002 cohort and found that 40% of that group is in good standing and expected to graduate by Summer 2008.)

- **Compare the program's graduation rate with those of the other programs at CSU and offer possible explanations for this program's unusually high or low graduation rate if applicable.**

The table below offers background information about the six students noted above who formed the 2001 cohort. The general sense in our department is that, in order for students to have a good chance of being

[†] The cohorts above are first-time full-time undergraduate students enrolled in a baccalaureate program who entered CSU in the fall or the preceding summer term.

successful in MATH1111 College Algebra, and MATH1113 Pre-calculus, a student should have a SATM of *at least* 500. So, in the absence of additional information, it appears that students #1, #2 and #4 were poorly advised regarding choice of major. Promising student #3 has evidently had a successful career at UGA, while students #5 and #6 could not get by the calculus sequence. The only case that warrants any further study is student #5 who seemed to have a reasonable shot, on paper, at completing the degree.

Where are they now?

Student	Background info	SATM	HS GPA
1	Currently enrolled in MKTG 3115, no degree, major still listed as math but advisor listed is in COB	480	3.36
2	Academic probation - not enrolled since spring 2002	450	3.56
3	Last term enrolled - spring 2002 (from google: "I am a senior at the University of Georgia majoring in Finance. I will graduate in the Spring of 2005")	610	3.68
4	Last term enrolled - spring 2007 (gap from 2002 to 2006). Advisor listed is in COE. 48 hours completed.	420	
5	Last term enrolled - spring 2002. Completed 20 hours. F in Math 1132.	560	3.26
6	Last term enrolled - spring 04. 3 unfruitful attempts at 1131. Completed 29 hours.	500	3.27

- **Describe methods to be pursued for program improvement.**

1. Seeing that first semester freshmen sometimes choose Mathematics as a major based on nonacademic considerations and without informed recommendations from faculty, we will investigate the availability of automated data collection tools that will allow us to

    a. early in the fall semester identify potentially at-risk first semester freshmen who have declared Mathematics as a major, and conduct follow up conferences with each to evaluate likelihood of success in the major, and

    b. identify those first semester freshmen majors who have not enrolled in Mathematics courses or who have enrolled but dropped; follow up conferences will help these students assess their interest in the major.

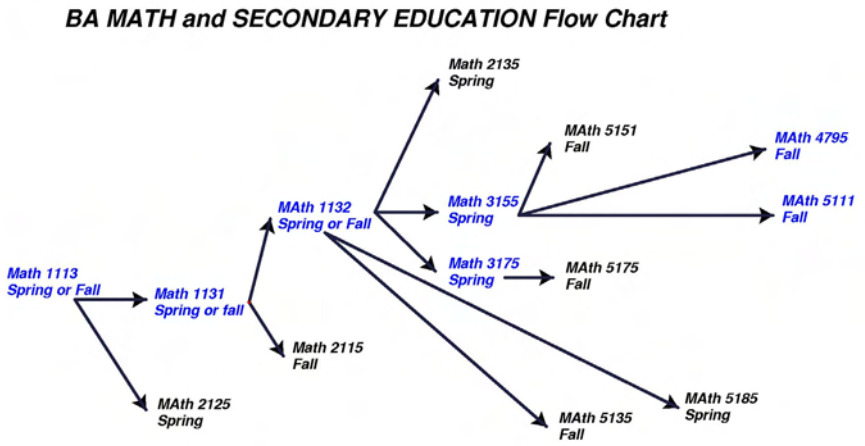
III D. Efficiency & Clarity of the Program's Course Requirements

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the efficiency and clarity of the program's course requirements as "satisfactory."

- **Analyze the published course requirements for program completion in terms of the simplicity and efficiency of the program's curricular design and the degree to which program requirements are communicated clearly and effectively.**

The published requirements for degrees in our program are well defined regarding the identification of required and elective courses. Simplicity and efficiency of design can be demonstrated via a requirements diagram as seen below. This diagram illustrates that this BA in Mathematics and Secondary Education program requires a minimum of six semesters if a student begins the major by enrolling in MATH 1113, Precalculus. (Requirements Diagrams for other tracks and degrees can be found in Appendix 3.)



- **Comment on the ease with which majors understand and successfully navigate through the required curriculum for program completion.**

We have identified and addressed two issues that affect student navigation through the curriculum:

1. The most notable problem was the tendency of students to enroll in MATH 5111, Abstract Algebra I, and MATH 5151, Real Analysis I, in the same semester with three other upper level Mathematics courses. After informal discussions with students, our schedule of course offerings was revised so that, MATH 5151 would be offered in Fall semesters, as usual, but MATH 5111 would be shifted to Spring semesters, to prevent students from unknowingly taking on too much of a challenge.

2. During Curriculum Committee meetings, discussion has focused on potential difficulties a rigid pre-requisite structure could pose for transfer students and for students who changed their major to Mathematics from something else. We continue to consider the implications for those students when we review curriculum revisions to our program.

- **Describe methods to be pursued for program improvement.**

(None required at this time.)

III E. Frequency and Sequencing of Course Offerings Required for Program Completion

We rate the frequency and sequencing of course offerings as "satisfactory."

State your assessment of the strength of the evidence of program productivity on this indicator.

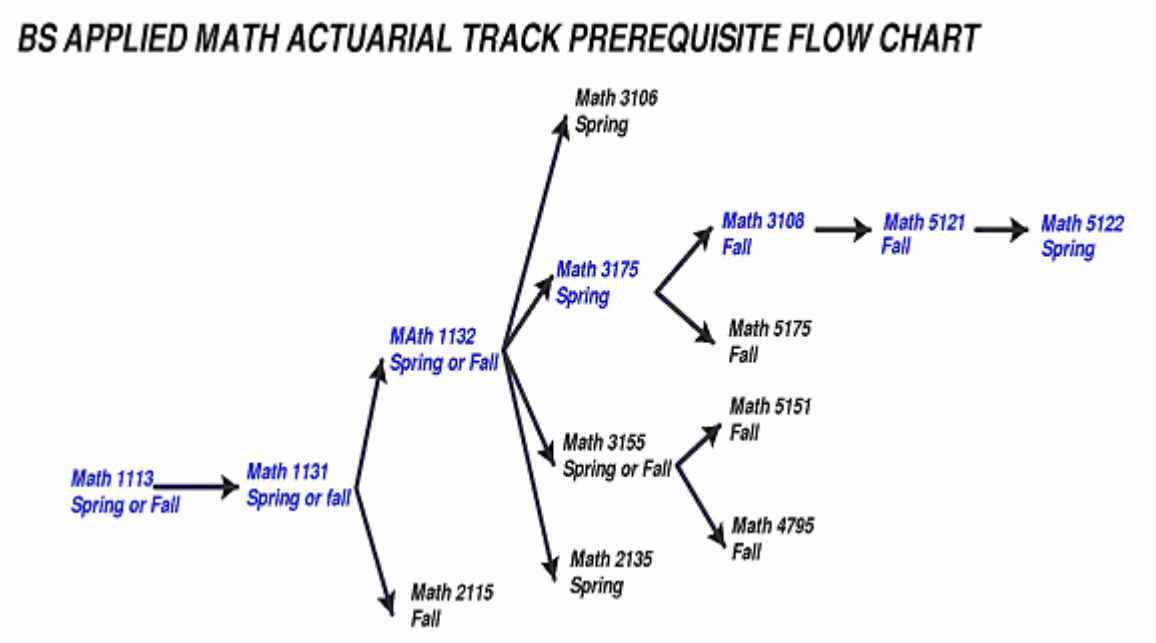
- **Analyze and interpret the scheduling and enrollment history of courses required for program completion, giving particular focus to the regularity, frequency, and sequencing of course offerings required for program completion.**

Note that the following table shows that most courses are offered at least once a year, every Fall or Spring. In special circumstances, when there is adequate student demand, some courses are offered in the summer. The table also indicates the introduction of courses to support our new track in the Applied Mathematics degree; these new courses have also been offered annually on in the Fall or Spring.

MAJOR-RELATED AND PROGRAM REQUIRED COURSE OFFERINGS 2003-2007
Number of Sections per Semester

		SP03	SU03	F03	SP04	SU04	F04	SP05	SU05	F05	SP06	SU06	F06	SP07	SU07	F07
MATH1165	Comp-Assist Prob Solving															1
MATH2115	Linear Algebra				1		1			1			1		1	1
MATH2125	Discrete Math										1			1		
MATH3106	Math Theory of Interest							1			1			1		
MATH3107	Differential Equations	1			1			1			1			1		
MATH3108	Act Science						1			1			1			1
MATH3155	Found for Advance Math							1			1		1	1		1
MATH3175	Probability						1				1			1		
MATH4795	Senior Seminar in Math				1			1		1			1			1
MATH5111	Abstract Algebra I			1			1			1			1			1
MATH5112	Abstract Algebra II				1			1			1					
MATH5118	App Nonpar Methods															
MATH5119	App Categ Data Analysis													1		
MATH5121	Act Math I										1					1
MATH5122	Act Math II															
MATH5135	College Geometry	1			1			1		1			1			1
MATH5151	Real Analysis I			1			1			1			1			1
MATH5152	Real Analysis II	1			1			1			1			1		
MATH5175	Math Statistics	1			1					1			1			1
MATH5185	History of Math			1			1				1			1		

The historical sequencing of courses agrees with the sequencing of courses required for various tracks. For instance, the BS in Applied Mathematics with a concentration in Actuarial Mathematics depicted below contains a critical flow path that shows a minimum of seven semesters to completion.



- **Describe methods to be pursued for program improvement.**

(None required at this time.)

III F. Enrollment in the Program's Required Courses

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the enrollment in our program's required courses as "satisfactory." The number of students enrolling in a key-indicator, upper division course, Foundations for Advanced Mathematics, has increased so much that we now offer two sections per year, as opposed to one.

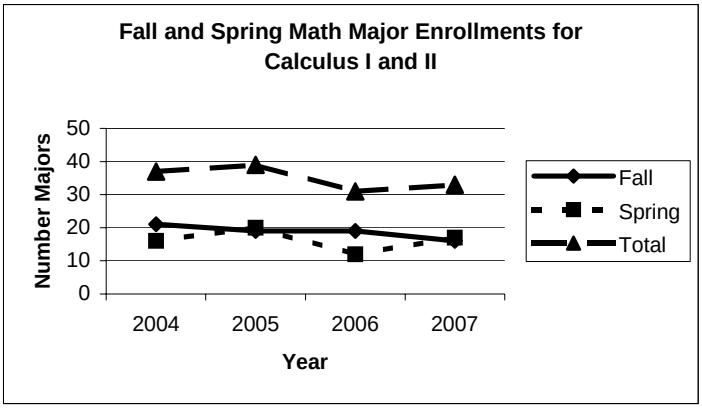
- **Analyze and interpret the strength of the enrollments in the courses required for program completion.**

With few exceptions, the overall trend in enrollment in all of the courses listed below is either generally stable or increasing over the past four years. Most significant is the trend of enrollment in the course MATH3155, Foundations for Advanced Mathematics. This course serves as the entry point for advanced courses for most degrees and tracks. As such the course is a clear indicator of health of our program. We note that student demand for the course has increased to such a degree that, for the first time, we needed to offer two sections in 2006-2007, with total enrollment of 29, a substantial increase over preceding fiscal years (although we have not yet determined the number of students repeating the course). We believe that part of this increase is due to the introduction of the BS in Applied Mathematics.

Similarly, enrollment in another key indicator course, MATH4795, Senior Seminar in Mathematics, shows a substantial increase this semester. Two courses, Abstract Algebra II, and Real Analysis II, show declining student interest over the past four years. For the most part, these declines can be attributed to changes in degree requirements tracks within the BS in Applied Mathematics degree.

ENROLLMENT IN THE MAJOR-RELATED AND PROGRAM REQUIRED COURSES 2003-2007

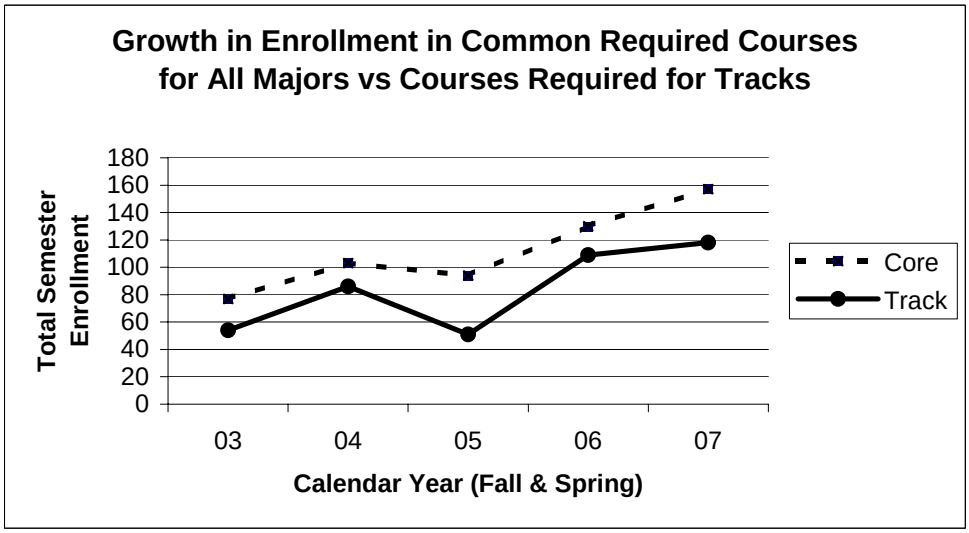
		SP03	SU03	F03	SP04	SU04	F04	SP05	SU05	F05	SP06	SU06	F06	SP07	SU07	F07
MATH1165	**Comp-Assist Prob Solving**				7											13
MATH2115	**Linear Algebra**			34			32			34			35		18	34
MATH2125	**Discrete Math**										28			29		
MATH3106	**Math Theory of Interest**							11			6			5		
MATH3107	**Differential Equations**	15			20			11			13			11		
MATH3108	**Actuarial Science**						6			5			3			5
MATH3155	**Found for Adv Math**							16			18		15	13		16
MATH3175	**Probability**						27				19			20		
MATH4795	**Senior Seminar in Math**				2			4		6			7			14
MATH5111	**Abstract Algebra I**			17			13			12			10			11
MATH5112	**Abstract Algebra II**				5			2			4					
MATH5118	**App Nonpar Methods**															
MATH5119	**App Cat Data Analysis**													4		
MATH5121	**Actuarial Math I**										4					7
MATH5122	**Actuarial Math II**															
MATH5135	**College Geometry**	15			16			8		11			16			16
MATH5151	**Real Analysis I**			11			15			15			13			17
MATH5152	**Real Analysis II**	15			5			7			7			4		
MATH5175	**Math Statistics**	15			7					7			13			19
MATH5185	**History of Math**			9			7				9			17		



Enrollment of Mathematics Majors in Calculus I and Calculus II can be used as an indicator of future numbers of graduates. The above diagram shows a relatively stable enrollment in these two feeder courses.

- **Comment on differences between core and elective course enrollments as well as differences among courses required for optional tracks or concentrations.**

Generally speaking, courses that are required for any optional track are listed among the elective courses for other tracks or concentrations. Other pure electives are seldom offered, very frequently as MATH5555, Selected Topics, during the summer session or pro bono by faculty during Fall and Spring semesters. The diagram below shows a balanced, parallel growth in enrollment in both common core courses for all majors, and required courses for particular tracks.



- **Identify any required courses that are dropped from the schedule of classes frequently due to low enrollment and which majors must complete through approved substitutions or directed studies.**

Before we cancel an upper level course we look at the students who have registered. If it is a required course for them, we try to protect it. The only exception that has occurred last year as a result of a recent

faculty resignation. We had actuarial students expecting to graduate in spring 07 that needed MATH 5121 and MATH 5122 but we had to cancel those courses because we had no one to teach them. Based on that departing faculty member's advice, statistics courses were used as substitutes for cancelled classes to enable those students to graduate on time. This was an unusual and isolated case.

In addition, Numerical Analysis, an elective for all programs, has been cancelled a couple of times because of low enrollment.

- **Describe methods to be pursued for program improvement.**

1. Enrollments in MATH5112 have been low. This, coupled with the fact that a majority of Mathematics majors are pursuing Secondary Education, may suggest reordering the topics in 5111/5112 so that rings and fields are presented first. The Curriculum Committee will consider this change.

III G. Diversity of the Program's Majors and Graduates

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the diversity of the program's majors and graduates as "below average." The number of minority majors, considered as a percentage of total CSU enrollment, continues to lag behind overall enrollment of black students in our institution

- **Analyze and interpret the gender, ethnicity, nationality, and age of the majors and graduates in the program.**

The majority of students declaring majors in mathematics are under 25 years of age. The table below shows the age composition of all undergraduates declaring a major in mathematics during the past three years. For age distributions categorized separately by individual programs, see Appendix 4.

Age diversity among Mathematics majors

Age	**2004/05**	**2005/06**	**2006/07**
Under 21	31	33	36
21-25	22	25	35
26-30	9	9	10
31-40	6	5	2
41-50	7	8	4
51-60	3	3	4
over 60	0	0	0
Total	78	83	91
Average age:	26	26	24

During the past 3 years, CSU has increased its recruiting efforts to students outside of the Columbus commuting radius. These efforts have been successful, but the average age of the student body has not changed significantly. The average age of mathematics majors has remained almost constant over the past three years.

The number of females who have declared majors in mathematics has increased over the reporting period. These figures are also in line with the trend at CSU where the percent of female students has increased during the same time period. The table below shows the number of declared Mathematics majors by gender. Distributions for each of the separate degrees can be found in Appendix 4.

Gender diversity among Mathematics majors

	2004/05	**2005/06**	**2006/07**
Females	43	55	53
Males	35	28	38
Total	78	83	91

On average 72.2% of declared majors during the three-year period have been white, 20.2% have been black, and 7.2% have belonged to other racial categories; however, this percentage continues to lag behind overall enrollment of black students in our institution. The number black students attending CSU has increased from approximately 29.6% to approximately 32.6% over the three years;. Table 4.3 shows the racial composition of all declared mathematics majors from 2004/05 to 2006/07. The distributions for each degree program can be found in Appendix 4.

Racial diversity among Mathematics majors

Combined Programs	**2004/05**	**2005/06**	**2006/07**
International Students	0	0	3
Asian	0	0	2
Black	16	16	20
Hispanic	1	1	1
American Indian	0	0	0
Multi-Racial	3	4	5
White	58	68	60
Total	*78*	*89*	*91*
CSUTotal	*6624*	*6764*	*NA*

- **Comment on the program's success and distinctiveness in enrolling and graduating a diverse mix of students.**

While CSU was increasing its recruiting efforts targeting minority students and students from outside the Columbus region, the university was also tightening its admission requirements. With better prepared students, the Department of Mathematics expects to see an increase in the graduation rates for all ethnic groups.

Since mathematics is often the area of weakness for students who might marginally qualify for admission to the university, the Department of Mathematics collaborated with the Department of Basic Studies to develop mathematics placement tests, a new preparatory algebra course, and improved advising. The ripple effect of these efforts should be that fewer faculty resources will be utilized to staff classes for students needing to repeat courses, a more positive attitude by students who succeed in their coursework due to proper placement, and greater efficiency in classrooms where students do possess the skills needed to master the content.

Since, as mentioned above, teachers play a key role in efforts to facilitate success in the classroom, the Department of Mathematics has increased its efforts to graduate the best secondary mathematics education majors possible. These students will be a key factor in the success of our future students. We know that each teacher that we graduate can positively influence classrooms of students each year. To attract a diverse mix of students into the Department of Mathematics, we need a diverse population of teachers in our schools and a diverse faculty.

- **Describe methods to be pursued for program improvement.**

1. We will seek ways to recruit minority students and faculty.
2. We will seek ways to increase retention among minority students by analyzing impediments to student success.

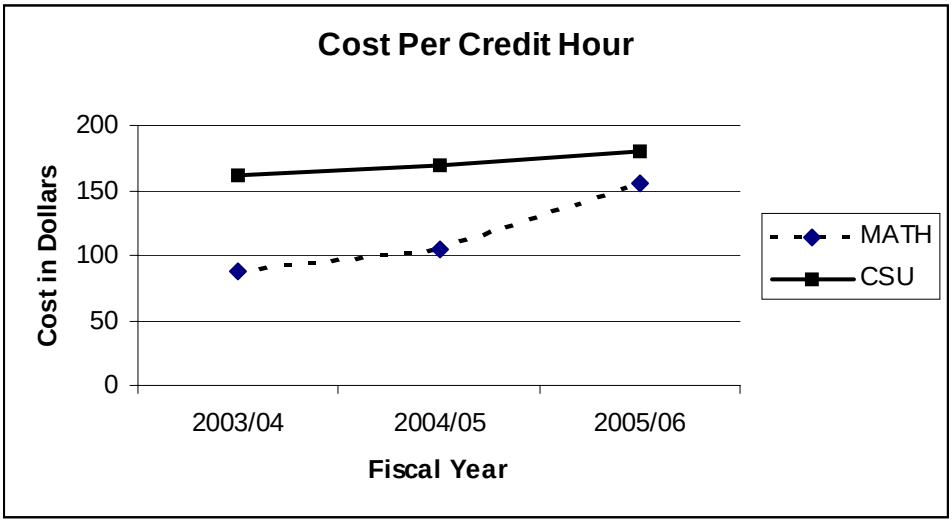
III H. Cost-Effectiveness of Instructional Delivery in the Program's Home Department

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the cost-effectiveness of instructional delivery in this program's home department as "above average," particularly because our department continues to be a low-cost producer when compared to the institutional average

- **Contrast the instructional cost-effectiveness of this program's home department with others at CSU.**

Instructional costs per credit hour for the past three years are summarized by the graph below. It shows that the cost of mathematics instruction has consistently fallen below average institutional costs, although the gap is closing.

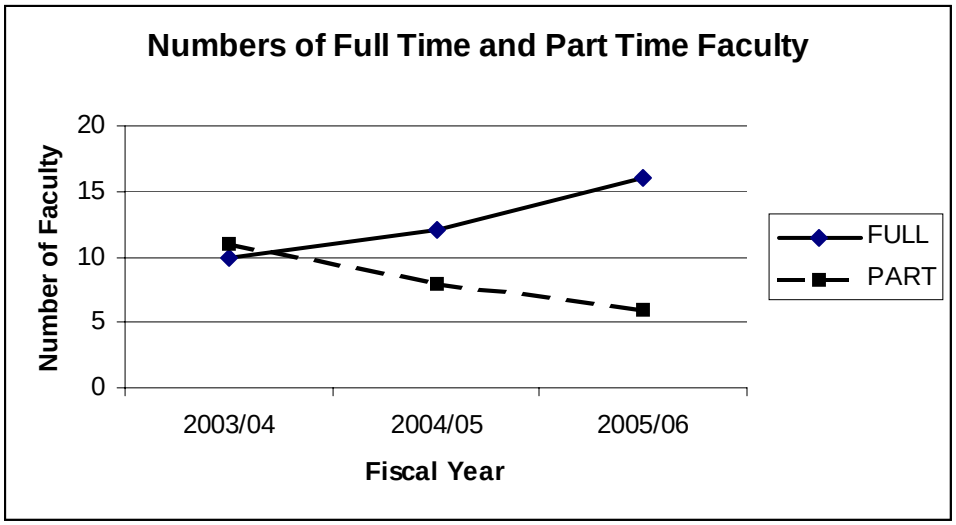


- **List the principal factors that cause this program's home department to appear to be unusually cost-effective (i.e., have a low ratio of instructional expenses per weighted credit hour of instruction) or to appear to be unusually costly (i.e., have a high cost per credit hour).**

Probable reasons for the growth in mathematics instructional costs include the following:

1. Mathematics credit hour production has temporarily declined due to the implementation of a math placement test in fall 2005.
2. Faculty salaries have increased as four faculty members have received equity adjustments to bring their salaries more in line with market levels.
3. Three new faculty members joined the department at higher ranks and salaries.

4. In the time frame of this study, we have reassigned the equivalent of one full time position to non-math administrative responsibilities as our faculty have been involved as the Assistant Director of Judicial Affairs, acting Associate Dean of the College of Science, and Executive Director of the CSU Centers of Excellence.
5. Our reliance on part time faculty declined between FY05 and FY07 in keeping with the CSU Strategic Planning Goal 1, which calls for us to staff at least 75% of the sections of each core course with full time faculty. This has been achieved by creating two new full time, tenure track faculty positions and increasing our utilization of non-tenure track faculty members – who draw employment benefits and cost more than part time instructors. The teaching load of non-tenure track faculty has been increased from 24 hours per year to 30. In addition, also added a half-time instructor teaching 15 hours per year.



- **Comment on the degree to which this program contributes to or detracts from the cost-effectiveness of the department.**

The cost data indicate that the Mathematics Department cost per credit hour is lower than the institutional average. However, because the Mathematics major programs tend to have lower enrollments, they do reduce our cost-effectiveness somewhat.

- **Describe methods to be pursued for program improvement.**

(None required at this time.)

III I. Program's Responsiveness to State Needs and Employer Demand for Program Graduates

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the program's responsiveness to state needs and employer demand for program graduates as "satisfactory."

- **Comment on the demand for graduates of this program, followed by an assessment of the program's success in responding productively to such need and demand.**

Graduates of the CSU mathematics programs are prepared for a wide variety of careers that demand strong analytical capabilities. A recent sampling of jobs on the jobs websites www.dice.com and www.monster.com reveals over 100 math- or statistics-related jobs listed in Georgia including positions with the following titles:

Actuary	Database and quantitative	Pricing analyst
Analyst – merchandising	research programmer	SAS data analyst
programs	Entry level consultant	SAS/SQL programmer
Benefits analyst	Logistics analyst	Teacher
Credit risk officer	Operations business analyst	Valuation manager
	Pension analyst	

Virtually everyone recognizes the state's dire need for more Mathematics teachers, hence the USG emphasis on doubling the number of teachers produced by 2010. The recent System focus on science, technology, engineering, and mathematics (STEM) through a statewide initiative also highlights the need for more mathematics graduates.

- **List the factors that limit the program's ability to be more productive and responsive to these needs and demands.**

Several factors have limited the growth of the mathematics programs. By far the greatest factor is a culture that tends to breed a fear of mathematics and focus on career training. Students who do excel in mathematics often fail to recognize that there are many careers available to graduates of Mathematics programs. Besides this external barrier, we seem to face a couple of internal obstacles.

The BA in Mathematics and Secondary Education appears to have its enrollment diminished by the particular program requirements. We continue to get reports that the foreign language requirement has deterred some students from selecting that program.

A second internal constraint appears to be faculty work loads. A potential selling point of our programs and the institution to prospective students is the opportunity to interact closely with faculty on authentic and interesting problems in the discipline. Mathematics research is demanding; posing research problems in a manner accessible to undergraduates is even more so. However, it is the best source of opportunities for engaging our students. A work load that is heavy on service teaching makes sustained research a formidable challenge for most faculty members.

- **Describe methods to be pursued for program improvement.**

(None required at this time.)

III J. Position of the Program's Annual Degree Productivity among Comparable USG Programs

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the program's degree productivity compared to comparable USG programs as "satisfactory." Within regional institutions drawing students primarily from outside the greater Atlanta area, the production of our program sits at the median.

- **Identify the ranking of this program relative to comparable programs in the University System of Georgia (or region or nation) in terms of the number of degrees granted annually.**

The table below differentiates between institutions drawing enrollments from the greater Atlanta area and those drawing more from regional areas. Within the regional institutions, the production of our mathematics program matches favorably with that of others.

Baccaluareate Degrees Awarded in Mathematics Programs at USG State Universities

USG Institution	2003/04	2004/05	2005/06	3-Year Avg
Kennesaw State Univ	30	30	41	34
North Georgia College & State Univ	9	6	12	9
Southern Poly State Univ	10	10	11	10
State Univ of West Georgia	9	16	8	11
Armstrong Atlantic State Univ	5	8	11	8
Albany State Univ	11	11	8	10
Columbus State Univ	3	8	7	6
Augusta State Univ	3	7	7	6
Fort Valley State Univ	6	6	7	6
Georgia Southwest State Univ	5	4	7	5
Savannah State Univ	3	1	7	4
Georgia College & State Univ	2	2	3	2
Clayton College & State Univ	0	0	1	0

In Fiscal year 2006/2007, the Mathematics program saw ten students receiving the baccalaureate degree. Furthermore, increasing trends in enrollment in courses required for the program as identified in section III.F. suggest a continued increase in the productivity of the program.

- **Describe methods to be pursued for program improvement.**

(None required at this time.)

III K. This Program's Contribution to Achieving CSU's Mission

State your assessment of the strength of the evidence of program productivity on this indicator.

We rate the program's contribution to achieving CSU's mission as "satisfactory."

- **List the substantive contributions this program makes to the achievement of CSU's published statement of institutional mission.**

"Columbus State University's mission is to promote educational, economic, social and cultural growth in Georgia and beyond."

The Mathematics programs support educational growth in the CSU service region by producing well prepared high school Mathematics teachers. In the past three years (FY05, FY06, and FY07) our secondary Mathematics education programs produced 11 graduates; altogether, Muscogee County High Schools employ approximately 80 high school Mathematics teachers and Harris County employs twelve. We are one of only six USG institutions offering bachelor's degrees in Mathematics with Secondary Education.

"The university is dedicated to excellence in teaching in a student-centered environment, research and creative activities, service to the region and the state, and community engagement through university-community partnerships."

The first priority of the mathematics faculty is excellent teaching. In the past three years, 3 Mathematics faculty members have served as mentors on 8 individualized student projects that resulted in public presentations of some form. The department continues to recognize and promote this type of student opportunity. Student engagement in research and creative experiences is facilitated by a faculty that remains active through scholarly pursuits. Eleven out of the twelve full-time, tenured or tenure-track Mathematics faculty members have published or presented their research in the past 5 years.

Our department also maintains a strong record of community service. The Mathematics faculty and staff work together each year to prepare a mathematics tournament for high school students within our service area. Our faculty members have been involved in two grants (Project STEADY and Project SMART) designed to provide mentorship and support to area K-12 school teachers, and they also support grants obtained by the Columbus Regional Mathematics Collaborative. One faculty member has helped with the design of geometry tasks to accompany the Georgia Performance Math Standards for grade 7. Another serves as the statewide coordinator of the American Mathematics Competitions.

- **Describe methods to be pursued for program improvement.**

(None required at this time.)

IV. Conclusion about the Program's Viability at CSU

Repeat the conclusion about the program's viability at CSU as reported in the executive summary and cite any additional detailed analyses, interpretations, or rationale that support this summary judgment.

Based on trends in our graduation rates and enrollments in key courses, we view the Mathematics program's viability to be satisfactory. We conferred 10 mathematics degrees in 2006-2007 and we expect to confer that many in 2007-2008. The fall 2007 enrollment in the senior seminar course is 14 – a good sign that graduation rates will rise. As part of our annual assessment process, we have carefully considered explicit suggestions from graduating seniors, implicit suggestions from student performance on national assessment exams, and specific dictates from state agencies. As a result of ensuing thoughtful discussions, we have implemented a significant number of curriculum changes that have accomplished the following:

- By adding two tracks to the applied major, we have stoked student interest in the study of mathematics, to the extent that the number of majors continues to rise, and the enrollment in a key-indicator course is increasing. At the same time, graduates of the actuarial track have demonstrated a clear competitiveness in a demanding job market.

- By creating the BA in Secondary Education, we have demonstrated that the goal of producing mathematics majors who enjoy teaching high school students is achievable.

- By engaging students in undergraduate research, we have verified student interest in participation in the act of "doing mathematics."

Clearly, curriculum assessment is an active part of doing business in the mathematics program. We anticipate additional careful studies of opportunities that will attract some of the best students in Biology, Chemistry, and Computer Science to the idea of the "double major" or major/minor. As a consequence, we see continued, controlled growth and development in the baccalaureate degrees in mathematics.

V. Program Improvement Plan

Highlight the department's plans, priorities, and timetable for improving the program's quality and productivity if the program is judged to be viable.

TO IMPROVE PROGRAM QUALITY

1. We must find a way to count faculty involvement in undergraduate research as part of the regular teaching load.

We will discuss a draft of a policy that provides faculty with one course reassigned time for every three students directed in the Undergraduate Research course. If approved, the policy will then be presented to the Dean for consideration.

2. We must see to it that faculty who participate in undergraduate research have a reasonable opportunity to conduct substantial research of their own.

We will discuss a draft of a policy that defines a procedure by which a faculty member who has been or who plans to be active in directing students in Undergraduate Research can petition for one course release time. This release time is to be viewed as either an opportunity to rekindle subject matter enthusiasm or as a way to prepare for future research opportunities for students. If approved, the policy will then be presented to the Dean for consideration.

TO IMPROVE PROGRAM PRODUCTIVITY

1. We must find ways to guarantee that first-semester freshmen mathematics majors are correctly advised and their progress closely monitored during their first year.

The faculty will determine the best approach to the solution of freshmen advising problems. In particular, the faculty will consider advising related issued identified in the report and establish timelines for a solution to be implemented in the fall of 2008.

2. We must find ways to recruit and retain minority students.

The faculty will determine the best approach to hiring and retaining minority faculty. This strategy will be implemented in the upcoming faculty search process. The faculty will determine the best approach and associated time-table to recruit and retain minority mathematics majors.

3. We must remove impediments to developing student interest in the Applied Statistics Track of the BS and in the baccalaureate in Mathematics Secondary Education.

The Curriculum Committee will meet to determine steps to be taken to solve prerequisite issues in the Applied Stat track and foreign language requirement issues in the BA in Mathematics Education so that changes are reflected **in the 2008-2009 Catalog.**

VI. Summary Recommendation

Highlight the department's recommendations, rationale, plans, and timetable for expanding, maintaining, reducing, or consolidating/discontinuing the program.

We recommend **Maintaining the Program at the Current Level.** We have reasonably judged our program to have an *above average* rating for program quality and an *average* rating for productivity. We strongly recommend a modest investment of funds in the continued and enhanced professional development of all full-time faculty. Our self-assessment points to a highly active faculty whose members have a high regard for undergraduate research and other professional interaction with students outside the classroom. Enhanced professional development of our faculty is easily the most important issue in maintaining and improving the quality of our program.

We see a need for small curriculum changes in two of our programs that will likely draw more students to our Applied Statistics Track in the BS and the BA in Mathematics and Secondary Education. These changes could have a substantial impact on enrollment in the near term. In addition, a further positive impact on productivity will come from a thoughtful reconsideration of our student advising process, particularly for incoming freshmen. The cost of implementing a new advising process will depend on the UGA System plans for advising enhancement. We include in the advising process any support we identify as necessary for the improved retention of minority students.

In summary, many changes necessary to increase productivity should be in place in the fall of 2008. Our analysis of data presented by the VPAA's office shows existing positive trends in numbers of majors, enrollment in upper division courses, and graduation rates. With changes we have identified, we anticipate continued growth in our programs.

APPENDIX 1

SAMPLE STUDENT EVALUATION FORM

COLUMBUS STATE UNIVERSITY
Students' Evaluation of Faculty

Course_____ **Date**_____

This questionnaire gives you an opportunity to express anonymously your views of this course and the way it has been taught. The reason for obtaining the information is to assist in the improvement of instruction. It will serve this purpose best if you answer the items carefully and honestly.

Read each statement carefully and indicate your response by darkening one number in the appropriate block. In rare cases where you believe the statement does not apply or where you do not have sufficient information to make an estimate, darken "No Opinion."

DARKEN THE APPROPRIATE BLOCK TO THE RIGHT OF EACH STATEMENT.

SECTION NUMBER

SECTION LETTER

DIRECTIONS

- USE #2 PENCIL OR BLACK OR BLUE BALL POINT PEN.
- MAKE ***HEAVY DARK*** MARKS.
- ERASE ***COMPLETELY*** TO CHANGE.
- MAKE NO STRAY MARKS.

	STRONGLY AGREE				STRONGLY DISAGREE	NO OPINION
THE COURSE						
1. The textbook(s) for this course is useful. (Omit this question if textbook(s) not required.)	5	4	3	2	1	0
2. The content of this course is valuable.	5	4	3	2	1	0
THE INSTRUCTOR						
ATTITUDE TOWARDS STUDENTS						
3. The instructor is concerned with whether the student learns the material.	5	4	3	2	1	0
4. The instructor treats students in a considerate and adult manner.	5	4	3	2	1	0
5. The instructor has been available during posted office hours.	5	4	3	2	1	0
6. I have felt free to ask for outside help.	5	4	3	2	1	0
7. The instructor recognizes students' difficulties in understanding new material.	5	4	3	2	1	0
SUBJECT MATTER PRESENTATION						
8. The instructor has a sense of humor.	5	4	3	2	1	0
9. The instructor shows enthusiasm for the subject matter.	5	4	3	2	1	0
10. The instructor welcomes questions and comments.	5	4	3	2	1	0
11. The instructor is confident and meets difficulties with poise.	5	4	3	2	1	0
CLASSROOM ATMOSPHERE						
12. The instructor comes to class well-prepared.	5	4	3	2	1	0
13. The instructor presents the material in a logical and well-arranged order.	5	4	3	2	1	0
14. The instructor does a good job of answering students' questions.	5	4	3	2	1	0
15. The instructor is willing to explain material which the class does not understand.	5	4	3	2	1	0
16. The instructor makes clear what is expected of students in this course.	5	4	3	2	1	0
17. The instructor uses the chalkboard and/or other audiovisual materials to effectively contribute to my understanding of this course.	5	4	3	2	1	0
GRADING PRACTICES						
18. The instructor has clearly described the grading procedures.	5	4	3	2	1	0
19. The instructor has clearly indicated what materials the test would cover.	5	4	3	2	1	0
20. The tests require the student to know the material well.	5	4	3	2	1	0
21. The instructor's grading system is consistent.	5	4	3	2	1	0
22. Test results are returned in a reasonable length of time.	5	4	3	2	1	0
TEACHER EFFECTIVENESS						
23. I have developed a better understanding of the subject by taking this course.	5	4	3	2	1	0
24. I would like to take another course from this instructor.	5	4	3	2	1	0
25. Considering each of the above characteristics, the instructor of this course is effective.	5	4	3	2	1	0
26. This instructor should be recognized as an outstanding teacher.	5	4	3	2	1	0

APPENDIX 2

FACULTY PUBLICATIONS, WORKS IN PROGRESS, AND PAPERS PRESENTED

PUBLICATIONS
TENURED AND TENURE-TRACK FACULTY

Almada, Carlos

- *"Harmonic reductions in Principal Fiber Bundles"*, Published in *Reports on Mathematical Physics* Vol. 38, 1996.

Bhandary, Mahdusudan

- Bhandary, M. (2006). "Test for Generalized Variance in Signal Processing When the Errors are Equicorrelated." *Journal of Statistical Theory and Applications*, Vol. 5, No. 3, 292-305.

- Tumuhaiwe, E., R. Magel, M. Bhandary, M.L. Khaitsa (2007). "Salmonelloisis Outbreaks in Humans in the United States – 1990 – 2003". *Food Protection Trends*, Vol. 27, No. 5, 300 - 306.

- Bhandary, M. (1989). "Detection of Outliers in Signal Processing and Detection of Number of Signals in Presence of Outliers." *Communications in Statistics - Theory and Methods*, Vol. 18, No. 6, 2233-2261.

- Bhandary, M. (1991). "Robust M-estimation of Dispersion Matrix With a Structure." *Annals of the Institute of Statistical Mathematics*, Vol. 43, No. 4, 689-705.

- Bansal, N.K. and Bhandary, M. (1991). "Bayes Estimation of Number of Signals." *Annals of the Institute of Statistical Mathematics*, Vol. 43, No. 2, 227-243.

- Bhandary, M. (1992). "Detection of the Numbers of Outliers Present in a Data Set using an Information Theoretic Criterion." *Communications in Statistics--Theory and Methods*, Vol. 21, No. 11, 3263-3274.

- Bhandary, M. and Bansal, N.K. (1993). "Detection of Outliers in Familial Data." *Communications in Statistics--Theory and Methods*, Vol. 22, No. 9, 2669-2685.

- Bansal, N.K. and Bhandary, M. (1994). "Robust M-estimation of Intraclass Correlation Coefficient." *Australian Journal of Statistics*, Vol. 36, No. 3, 287-301.

- Bhandary, M. (1995). "Detection of Outliers in the Linear Model when the Regression Parameters are Stochastic." *Communications in Statistics--Theory and Methods*, Vol. 24, No. 1, 153-173.

- Bhandary, M. (1995). "Detection of Outliers in Growth Curve Models." *Communications in Statistics--Theory and Methods*, Vol. 24, No. 8, 1923-1940.

- Bhandary, M. (1996). "Test for Generalized Variance in Signal Processing." *Statistics and Probability Letters*, Vol. 27, 155-162.

- Bhandary, M. (1998). "Detection of the Number of Signals in the Presence of White-Noise in Decentralized Processing." *IEEE Transactions on Signal Processing*, Vol. 46, No. 3, 800-803.

- Young, D. and Bhandary, M. (1998). "Test for the Equality of Intraclass Correlation Co-Efficients Under Unequal Family Sizes." *Biometrics*, Vol 54, No. 4, 1363-1373.

- Bansal, N.K. and Bhandary, M. (2000). "Bayes Estimation of Intraclass Correlation Coefficients." *Communications in Statistics, Theory and Methods*, Vol. 29, No. 1, 79-93.

- Bhandary, M. and Mohammed Khorsed Alam (2000). "Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." *Communications in Statistics, Theory and Methods*, Vol 29, No. 4, 755-768.

- Bhandary, M. (2002). "Detection of Outliers in Signal Processing When the Noise Covariance Matrix is Arbitrary." *Calcutta Statistical Association Bulletin*, Vol. 53, Nos. 209-210, 109-116.

- Bhandary, M. (2003). "Detection of Outliers in Multivariate Data When Errors are Autocorrelated." *American Journal of Mathematical and Management Sciences*, Vol. 23, No. 3 & 4, 267- 286.

- Bhandary, M. and Wijetunga, A. (2003). "Robust M-Estimation of Dispersion Matrix in the Linear Model When the Regression Parameters are Stochastic." *Proceedings of the Graybill Conference on Linear, Non-Linear, and Generalized Linear Models, 2001*, pgs. 301-313.

- Bhandary, M. (2005). "Test for the Equality of AutoCorrelation Coefficients for Two Populations." *Statistics and Probability Letters, Vol. 73, No. 4, 333-342.*

- Bhandary, M. and Fujiwara, K. (2006). " A Small Sample Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." *Communications in Statistics – Simulation and Computation*, Vol. 35, No. 3, 765-778.

- Bhandary, M. (2006). "Test for Generalized Variance in Factor Analysis Model." *Communications in Statistics-Simulation and Computation, Vol. 35, No. 4, 969-973.*

Dai, Hongying

- Joan R. Griffith, Starr Gantz, Jill Lowry, Hongying Dai, Henrietta Bada. "Insurance Reimbursement in a University-Based Primary Care Pediatric Weight Management Clinic", *Journal of the National Medical Association*, 99, 9, 1037-1041.

- Hongying Dai and Richard Charnigo. (2007) "Omnibus Testing and Gene Filtration in Microarray Data Analysis", *Journal of Applied Statistics*, 34, 10.

- V John, Hongying Dai, A Talati, R Charnigo, MR Neuman, H Bada. (2007) "Autonomic Alterations in Cocaine-Exposed Neonates Following Orthostatic Stress", *Pediatric Research*, 61, 2, 251-256.

Deng, Baiqiao

- B. Deng and C. Heil, "Density of Gabor Schauder Bases", SPIE Proceedings Vol. 4119: *Wavelet Applications in Signal and Image processing VIII*, 2000, pp153-164.

- O. Christensen, B. Deng, and C. Heil, "Density of Gabor frames", *Applied and Computational Harmonic Analysis*, vol 7, pp. 292-304, 1999.

- B. Deng and B. Jawerth, “Wavelet Packets on Closed Intervals", *the 14th IMACS on Computational and Applied Mathematics Proceedings*, Volume 3, p1203-1205, 1994.

- B. Deng, B. Jawerth, G. Petters, and W. Sweldens, "Wavelet probing for compression based segmentation", *Mathematical Imaging: Wavelet Applications in Signal and Image Processing SPIE Proceedings Series* volume 2034, p266-276, 1993.

Fouche, Kitty

- Fouche, K. (2000). Discovering arithmetic sequences. *Journal of the Florida Council of Teachers of Mathematics*, 20(*1*), 16-18.

- Fouche, K. (1997). Algebra for all: Start early. National Council of Teachers of Mathematics, Mathematics *Teaching in the Middle School*, 2(*4*), 226-229.

- Fouche, K. (1996). Looking back: Multiple solutions and solution methods. *Journal of the Florida Council of Teachers of Mathematics*, 16(*2*), 19-22.

- Fouche, K. (1991). *Training manual for the Texas Instruments graphic calculator*. Florida Department of Education.

- Fouche, K. & Scudder, S. (1990). *Computer activities for exploring graphing and probability.* Glenville, IL: Scott, Foresman and Co.

Henning, Cindy

- Georgia Performance Standards: Seventh Grade Framework Committee (2006) “Unit 4: Flip, Slide, and Turn” (2006). Available online at: http://www.georgiastandards.org/mathframework.aspx

- Henning, C. & Muse, W (submitted for publication 2006) Revising and assessing content courses for elementary teachers, *PMET Volume of the MAA Notes and Reports Series*.

- “Foundations for Success: Mathematics expectations for grades K-8. Review by the Association of Mathematics Teacher Educators” (2004). A report produced by the AMTE Achieve Task Force.

Howard, Tim

- *Controlling limits of Boltzmann-type ODEs*, "Nonlinear Analysis, Theory, Methods, and Applications", Vol. 30, pp. 465-470, Proceedings of the Second World Congress of Nonlinear Analysts.

Ionascu, Eugen

- A parametrization of equilateral triangles having integer coordinates, Journal of Integer Sequences, 10, (2007), Article 07.6.7

- with F. Luca and P. Stanica, Heron triangles with two fixed sides, Journal of Number Theory, 126, (2007), 52-67.

- with P. Stanica, Extreme values for the area of rectangles with vertices on concentrical circles, Elemente der Mathematik, 62 (2007), 40-43.

- with Yang Wang, Simultaneous Translational and Multiplicative Tiling and Wavelet Sets in R2, Indiana Univ. Math. J., 55, No 6 (2006).

- On ring homomorphisms of C(R) whose range consists of smooth functions, Gazeta Matematica, A series, 4, 2006

- with P. Stanica, E_ective Asymptotics for Some Nonlinear Recurrences and Almost Doubly-Exponential Sequences, Acta Math. Univ. Comenian. (N.S.) 73 (2004), no. 1, 75–87.

- A new construction of wavelet sets, Real Anal. Exchange 28 (2002/03), no. 2, 593–609

- with E. Azo_, D. R. Larson and C. Pearcy, Direct paths of wavelets, Houston J. Math. 29 (2003), no. 3, 737–756 (electronic).

- Rank-one perturbations of diagonal operators, Integral Equations and Operator Theory, 39 (2001), 421–440.

- with E. Azo_, Wandering sets for a class of Borel isomorphisms of [0, 1), The Journal of Fourier Analysis and Applications, 6 (2000), 623–638.

- with C. M. Pearcy, On subwavelet sets, Proc. Amer. Math. Soc., 126 (1998), 3549–3552.

- with D. R. Larson and C. M. Pearcy, On wavelet sets, J. Fourier Anal. and Appl., 4(1998), no. 6, 711–721.

- with C. Pearcy and D. Larson, On the unitary systems a_liated with orthonormal wavelet

- theory in n-dimensions, J. Funct. Anal., 157 (1998), 413–431.

- On the structure of operators and wavelets , thesis, Texas A&M University, 1997.

- On power bounded operators, Proc. Amer. Math. Soc., 125(1997), 1435-1441.

- Jordan decomposition and factorization for nonnegative operator-valued functions, Rev. Roumaine Math. Pures Appl., 37(1992), 691-699.

- with F.-H. Vasilescu, Joint spectral properties for permutable linear transformations, J. Reine Angew. Math. 426(1992), 23-45.

Linton, Ron

- "Adapting Binary Fitness Functions in Genetic Algorithms", *Proceedings of the 42nd Annual Southeast ACM Conference*, Huntsville, Alabama, April 2 – 3, 2004: 391 - 395

- "An Evaluation of the Thierens Recombination Operator for Genetic Algorithms", *Proceedings of the 41st Annual Southeast ACM Conference*, Savannah, Georgia, March 7 – 8, 2003: 257-262.

- Chouchane, Mohamed and Ronald Linton, "Comparative Performance of C++ and Java

Implementations of a Genetic Algorithm", *Proceedings of the 41st Annual Southeast ACM Conference*, Savannah, Georgia, March 7 – 8, 2003: 202-207.

- McClure, Maxwell and Ronald Linton, "Proper Timing of Fitness Function Adaptation in Genetic Algorithms", *Proceedings of the 41st Annual Southeast ACM Conference*, Savannah, Georgia, March 7 – 8, 2003: 251-256.

- "Policies for Managing Composite, Epistatic Fitness Functions in Genetic Algorithms," *Proceedings of the 40th Annual Southeast ACM Conference*, Raleigh, North Carolina, April 26-27, 2002: 23-30.

- "Tuning Genetic Algorithm Parameters for Research in Finite Semigroups," *Proceedings 39th Annual ACM Southeast Conference*, Atlanta, Georgia, March 16 – 17, 2001: 24-29.

- "Java Databases - Investigating JDBC via Visual Cafe for Java," (abstract), *Journal of Computing in Small Colleges*, Vol.13, No. 4, 1998: 298.

- Linton, Ron and Jim Goodnow, "Taking Windows-based Instructional Aides to the Web," *Journal of Computing in Small Colleges*, Vol.13, No. 4, 1998: 269-276.

- Pedigo, Ron, Jim Goodnow and Ronald Linton, "Improving Student Performance in Database Design - A Preliminary Report," *Journal of Computing in Small Colleges*, Vol.11, No. 4, 1996: 351 - 355.

- "Managing Triggers in Distributed, Active Databases," *Proceedings Southwest Business Symposium*, Edmond, OK, April 6-7, 1995: 218 - 226.

- "In Search of Enriching Multimedia Applications in CIS Instruction," *Journal of Computing in Small Colleges*, Vol. 9, No. 5, 1994: 29 - 33.

- "Applying Expert DBMS Technology to EIS Architecture Design," *Proceedings ISAM Midwest Business Administration Association*, Chicago, IL, March 16 - 18, 1994: 82 - 88.

- "POSTGRES Revisited: A Business Application Perspective," *Proceedings Annual Computer Science Conference*, Kansas City, MO, March 3 - 5, 1992: 549 - 554.

- "Rule-based Computational DBMSs," *Proceedings Annual Computer Science Conference*, San Antonio, TX, March 5 - 7, 1991: 523 - 529.

- Linton, Ron and Jake Wambsganss, "Expert Executive Information Systems - Key to Small Business Success?" (Abstract), *Proceedings Annual Decision Sciences Institute Meeting*, San Diego, CA, November 19 - 21, 1990: 947.

- "A Structured Language for Rule-based Computational DBMSs," *Proceedings Annual Decision Sciences Institute Meeting*, San Diego, CA, November 19 - 21, 1990: 1088 - 1089.

- "Applications of Rule-based Computational DBMSs," *Proceedings Southwest Business Symposium, Edmond*, OK, April 19 - 20, 1990: 157 - 163.

- "COBOL Business Graphics" (Abstract), *Proceedings Annual Computer Science Conference*, Louisville, KY, February 21 - 23, 1989: 456.

- "Automating Enrollment Projections of University Students," *Proceedings of the Annual Meeting of the International Business School Computer Users Group*, Atlanta, GA, July 29 - 31, 1985: 107-112.

- "λ-Large Subgroups of C_λ-groups," *Pacific Journal of Mathematics*, Vol 75, No 2, 1978: 477-485.

- "Big Subgroups," *Alabama Journal of Mathematics*, Vol 1, No 2, 1977: 4-8.

- Linton, Ronald and Charles Megibben "Extensions of Totally Projective Groups," *Proceedings of the American Mathematical Society*, Vol 64, 1977: 35-38.

- "On Fully Invariant Subgroups of Primary Groups," *Michigan Mathematics Journal*, Vol 22, 1975: 281-284.

- "Abelian Groups in which Every Neat Subgroups is a Direct Summand," *Publicationes Mathematicae*, Vol 20, 1973: 157-160.

Muse, Brian

- W. B. Muse, K. T. Phelps, Orthogonal quadruple systems and 3-frames. The Journal of Combinatorial Theory, Series A 104 1 (2003), pp. 115-124.

Stancu, Alin

- Hochschild Cohomology and Derived Categories, Preprint.

Tu, Renjin

- Locally Asymptotically Optimal Designs for Testing in Logistics Regression, *The Annals of Statistics* 29, 4 (2001), 1050-1057 (with Carl Spruill)

- Comparison between confidence intervals of linear regression models with and without restriction, *Communications in Statistics Part A: Theory and Methods* 28, 12 (1999), 2879-2898

- Order restricted statistical inference in linear regression, *Journal of the American StatisticalAssociation* 90 (1995), 717-728 (with H. Mukerjee)

- Integral global optimization methods in statistical computation, *Computers and Mathematics with Applications* 25 (1993), 9-18 (with Q. Zheng)

- Numerical solution and error estimation for electronic and ionic heat-flow equation, *Journal of Shanghai University of Science and Technology*, 4 (1981), 126-133

PRESENTATIONS
TENURED AND TENURE-TRACK FACULTY

Almada, Carlos

- With Laura Nunley, *"An Elementary Approach to Least Squares"* at The Mathematical Association of America Southeastern Section, March 16-17, 2007.
- *"An Empirical Approach to the Derivation of the Volume Function for Certain Regular Solids"* a workshop presentation at The Twelfth Annual Mathematics Technology Conference at Valdosta State University. February 23, 2007.
- With Laura Nunley, *"An Empirical Approach to the Derivation of the Volume Function for Certain Regular Solids"* at The 47th Annual Georgia Mathematics Conference Rock Eagle 4-H Center, October 19-21, 2006
- *"Differential Equations with Winplot"* a workshop presentation at The Eleventh Annual Mathematics Technology Conference at Valdosta State University. February 24, 2006.
- "*A Remark on a Result by Kato*" at the AMS Fall 2005 Southeast Section Meeting in Johnson City, TN.
- *"Introduction to Winplot"* a workshop presentation at The Tenth Annual Mathematics Technology Conference at Valdosta State University. February 25, 2005.
- "The Banach Measure Problem" ,at the Mathematics Colloquium at CSU, February 17, 2005
- "Global Weak Hyperbolic Harmonic Maps into Euclidean Spheres" at the AMS Fall 2004 Southeastern Section Meeting in Vanderbilt University in Nashville, TN.
- *"Winplot"* presentation at The Ninth Annual Mathematics Technology Conference at Valdosta State University. February 27, 2004.
- Gave a presentation, within the department, on the use of the mathematics software Winplot, Fall 2003.
- "The Axiom of Choice and The Banach Tarski Paradox" at the Appalachian Regional Mathematics Seminar, King College, Bristol Tennessee. April 2001
- "Measure of Sets and the Axiom of Choice" at Department of Mathematics, Emory & Henry College, Emory, Virginia. February 2001.
- "The Wave Equation on Symmetric Spaces" and "Decay Properties of solutions to the Wave Equation on Symmetric Spaces" at the Institute for Advanced Study / Park City Mathematics Institute in Park City, Utah, July '95.
- "The Wave Equation on Symmetric Spaces" at the X Seminario Interuniversitario de Investigación Matemática (SIDIM), University of Puerto Rico at Río Piedras, Spring '95.
- "Measure Theory and the Lebesgue Integral" at the Coloquio de Física in the Physics Department, University of Puerto Rico at Mayagüez, Fall '94.

- "The Wave Equation on Globally Hyperbolic Manifolds" at the Third Workshop on Operator Theory and Evolution Equations, University of Puerto Rico at Río Piedras, Spring '93.

- "The Wave Equation on Globally Hyperbolic Manifolds" at the VIII Seminario Interuniversitario de Investigación Matemática (SIDIM) Inter-American University at San Germán, Spring '93.

- "Harmonic Reductions in Principal Fiber Bundles" at the VII Seminario Interuniversitario de Investigación Matemática (SIDIM) University of Puerto Rico at Mayagüez, Spring '92.

- "Harmonic Reductions in Principal Fiber Bundles" at the Coloquio de Matemática in the Mathematics Department, University of Puerto Rico at Mayagüez, Fall '91

Bhandary, Mahdusudan

- Bhandary, M. (June 1987). "Detection of the Number of Defective Components of Outliers in Signal Processing by Union-Intersection Principle and by Information Theoretic Criteria." University of Wisconsin--LaCrosse.

- Bhandary, M. (November 1988). "Development of a Sampling Expert System: FISHMAP." Presented at the Workshop of Technical Meeting on Analysis of Trawl Data at Woodhole, MA.

- Bhandary, M. (1988). "Detection of the Number of Defective Components of Outliers in Signal Processing." University ofMaryland, College Park.

- Bhandary, M. (March 1989). "Development of Sampling Design to Estimate Stock Abundance of Fish in Time and Space." University of Maryland, College Park, Department of Management Science.

- Bhandary, M. (February 1989). "Tactical and Strategic Models" presented at the Workshop of Technical Meeting on Statistical Analysis of Trawl Data at Maryland.

- Bhandary, M. (August 1993). "Detection of Outliers in Familial Data." American Statistical Association Conference in San Francisco, CA.

- Bhandary, M. (August 1995). "Detection of Outliers in Growth Curve Models." American Statistical Association Conference in Orlando, FL.

- Bhandary, M. (March 1995). "Detection of Outliers in the Linear Model When the Regression Parameters are Stochastic." Marquette University, Milwaukee.

- Bhandary, M. (August 1996). "Bayes Estimation of Intraclass Correlation Coefficients." American Statistical Association Conference in Chicago, IL.

- Bhandary, M. (August 1997). "Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes." American Statistical Association Conference in Anaheim, CA.

- Bhandary, M. (November 1998). "Detection of Outliers in Factor Analysis Model." Indian Institute of Management at Calcutta, India.

- Bhandary, M. (August 1999). "Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." American Statistical Association Conference in Baltimore, MD.

- Bhandary, M. (August 2002). "Detection of Outliers in Multivariate Data When Errors are Autocorrelated." American Statistical Association Conference in New York, NY.

- Bhandary, M. (March 2003). "Detection of Outliers in Multivariate Data When Errors are Autocorrelated." Marshall University, Huntington, West Virginia.

- Bhandary, M. (February 2004). "Detection of Outliers in Multivariate Data When Errors are Autocorrelated." San Francisco State University, San Francisco, California.

- Bhandary, M. (March,2005). " A Small Sample Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." University of Nevada, Reno, Nevada.

- Bhandary, M. (March, 2005). " A Small Sample Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." Texas State University, San Marcos, Texas.

- Bhandary, M. (June, 2005). " A Small Sample Test for the Equality of Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." Calcutta University, Calcutta, INDIA.

- Bhandary, M. (December, 2005). "Detection of Outliers in Multivariate Data When Errors are Autocorrelated." Columbus State University, Columbus, Georgia.

- Bhandary, M. (September, 2006). " A Small Sample Test for the Equality Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations." Columbus State University, Columbus, Georgia.

- Bhandary, M. (February, 2007). " A Small Sample Test for the Equality Intraclass Correlation Coefficients Under Unequal Family Sizes for Several Populations."

Dai, Hongying

- Hongying Dai and Richard Charnigo "Autonomic Alterations in Cocaine-Exposed Neonates Following Orthostatic Stress" Contributed Talk at MAA-SE, Statesboro, GA, March 16, 2007

- Hongying Dai and Richard Charnigo "L^2-Based Homogeneity Tests for Mixtures with Structural Parameters" Contributed Talk at ENAR, Atlanta, GA, March 13, 2007

- Hongying Dai and Richard Charnigo "Testing Homogeneity in Finite Mixtures and Mixture Regression Models" Contributed Talk at the ENAR, Tampa, FL, March 27, 2006

- Hongying Dai and Richard Charnigo "Estimation and Testing Procedures in General Contamination Models" Talk at SCMA 2005/ FIM XII International conference on Statistics, Combinatorics, Mathematics and Applications, Auburn, Alabama, December 4, 2005

- Hongying Dai and Richard Charnigo "L^2-Based Homogeneity Tests for Mixtures with Structural Parameters" Contributed Talk at the Joint Statistical Meetings, Minneapolis, MN, August 8, 2005

- Philip Bernard and Hongying Dai “Variability of ASA Physical Status Class Assignment among Pediatric Sedation Practitioners”, Poster at 2007 Pediatric Academic Societies' Annual Meeting, Toronto, Canada, May 5-8, 2007.

- Philip Bernard and Hongying Dai “Variability of ASA Physical Status Class Assignment among Pediatric Sedation Practitioners”, Talk at 2007 The Southern Society for Pediatric Research Annual Meeting, New Orland, LA, February 8-10, 2007

- Thitinart Sithisarn, Henrietta S Bada, Hongying Dai, and Sandra J Legan “Effect of Prenatal Oxycodone Exposure on the Stress Axis in Young Adult Rats” Poster at Clinical and Translational Spring Science Conference, Lexington, KY, June 6, 2006

- Thitinart Sithisarn, Henrietta S Bada, Hongying Dai, and Sandra J Legan, “Effect of Prenatal Oxycodone Exposure on the Stress Axis in Young Adult Rats” Poster at 2006 Pediatric Academic Societies' Annual Meeting, San Francisco, CA, April 2006

- Joan R. Griffith, Jody L. Clasey, Jason King, Starr Gantz, Hongying Dai, Henrietta S. Bada “Changing Roles of Mothers for Physical Activity in Children” Poster at 2006 Pediatric Academic Societies' Annual Meeting, San Francisco, CA, April 2006

- Joan R. Griffith, Jody L. Clasey, Jason King, Starr Gantz, Hongying Dai, Henrietta S. Bada, “Modeling and Aerobic Fitness in Overweight Teenagers” Poster at 2005 Building Interdisciplinary Research Careers in Women’s Helath (BIRCWH) meeting, Washington, DC, October, 2005

- Thitinart Sithisarn, Sandra J. Legan, Hongying Dai, Henrietta S. Bada, “Effect of Prenatal Cocaine Exposure on Behavior in Preweaning Rats”, Poster at 2005 Pediatric Academic Societies' AnnualMeeting, Washington, DC, May 2005

- Joan R. Griffith, Jody L. Clasey, Jason King, Starr Gantz, Hongying Dai, Henrietta S. Bada, “Parental Role Models as Determinants of Physical Activity in Children” Poster at 2005 Pediatric Academic Societies' Annual Meeting, Washington, DC, May 2005

- Joan Griffith, Jody Clasey, Jason King, Starr Gantz, Hongying Dai, Henrietta Bada, “Effect of Body Mass Index and Sex on Aerobic Fitness in Children”, Poster at 2005 Pediatric Academic Societies' Annual Meeting, Washington, DC, May 2005

Deng, Baiqiao

- "Convergence of Nonstationary Subdivision", Presentation at the Joint MAA/SIAM-SE conference at Auburn University, March 31-April 1 2006 at Auburn University

- “ Construction of Wavelets at Home” , Colloquium talk at department of mathematics, Clayton State University on March 22, 2005

- “ Subdivision: A Mathematical Scheme and Applications”, Rite of Passage Lecture at Columbus State University, January 22, 2004

- “Density of Gabor bases”, Talk at Georgia Tech Analysis Seminar, February 9, 2000

- "Density of Gabor Systems", Presentation at Sixteenth Auburn Miniconference on Harmonic Analysis and Related Area, December 10-11, 1999

- "Progressive Wavelets", Presentation at the Fourteenth Auburn Miniconference on Harmonic Analysis and Related areas in Auburn University on December 18-19, 1997

- Gave a lecture on Wavelet Theory and its applications and a workshop on American mathematics education at Beijing University of Chemical Technology of China, September 7-9, 1997

- "On existence of frames", Presentation at the Eighth Southeast Approximation Conference at Athens, Georgia on April 11-12, 1997

- "Average interpolation p-wavelets constructed by Haar systems", Presentation at the 102nd Annual Meeting of the American Mathematical Society and the Mathematical Association of America in Orlando, Florida on January 10-13, 1996

- "An introduction to wavelets", Talk in the departmental colloquium in fall of 1996

- "Wavelet Packets on Closed Intervals", Invited presentation at the 14th IMACS Conference (International Association for Mathematics and Computers in Simulation), in Atlanta, July 1994

- "Wavelet Packets on Closed Sets", Presentation at 72nd Annual Meeting of the Southeastern Section of MAA, April 1993

- "Multivariate Biorthogonal Wavelet Packets and Function Spaces", Presentation at the Annual Meeting of the Southeastern Atlantic Section of SIAM, March 1993

- "Compression of Multivariate Biorthogonal Wavelet Packet Decomposition", Presentation at AMS-MAA Joint Meeting, January 1993

Fouche, Kitty

- Speaker at the Columbus Regional Mathematics Collaborative Summer Institute for K-12 mathematics teachers (2005)

- Speaker at the National Council of Teachers of Mathematics Regional Conference, (2005)

- Speaker at the Georgia Council Teachers of Mathematics Conference, (October 2005)

- Keynote speaker for a conference for teachers from four regional military bases, Ft. Benning, GA, (2004)

- Keynote speaker for the Columbus Regional Mathematics Collaborative Fall Fest (2003)

Henning, Cindy

- Henning, C, & Jones, K. (March, 2007), "Exploring Geometry from Elementary School through College with Sketchpad." Paper presented at National Council of Teachers of Mathematics Annual Meeting, Atlanta, GA.

- Henning, C. (January, 2007) "Writing Enhanced Mathematics Courses of Pre-service Elementary Teachers." Paper presented at the Association of Mathematics Teacher Educators, Irvine, CA

- Henning, C. (March, 2006) "Defining Mathematical and Educational Goals in Mathematics Courses for Elementary Teachers." Paper presented at the Sectional meeting the Mathematical Association of America/SIAM, Auburn, Alabama.

- Henning, C. Gober, D., Fouche, K., & Henning, C. (October, 2005) "Using Mathematically Rich Problems to Address the Georgia Performance Standards." Presented at the Georgia National Council of Teachers of Mathematics, Rock Eagle, GA.

- Henning, C., Sellers, C., Szabo, T., Thames, V., & Wildrick, H.(October, 2005) "Probability Shoebox Centers." Presented at the Southern Regional Conference of the National Council of Teachers of Mathematics, Birmingham, AL.

- Henning, C., & Blanton, M. (January, 2005). "Classroom Discourse Analysis as a Professional Development Tool." Paper presented at the Association of Mathematics Teacher Educators, Dallas, TX.

- Henning, C. (January, 2004). "Learning to Teach Standards-Based Mathematics: The Impact of Collaborative Inquiry Groups." Paper presented at the Association of Mathematics Teacher Educators, San Diego, CA.

- Henning, C. (October 2002). "Introducing Slope: TI-83 and the Calculator-Based Ranger." Presented at the Southern Regional Conference of the National Council of Teachers of Mathematics, Biloxi, MS.

- Henning, C. (March 2002). "Can Elementary Modeling be a True Alternative to Algebra?" Presented at the Southeastern Meeting of the Mathematics Association of America, Atlanta, GA.

Howard, Tim

- *Analysis of a Two-Player Game that Opens Undergraduate Research Opportunities*, based on work with Eugen Ionascu and David Woolbright, Annual meeting of the Southeastern Section of the Mathematical Association of America, Georgia Southern University, March 2007

- *Calculus Explorations Using Winplot*, Georgia Perimeter College Math Conference, February 2005

- *Engaging Students with Mathematically-Rich Problems*, with Debbie Gober and Ann Assad, Georgia Council of Teachers of Mathematics, October 2004

- *Finding Bounds for the Prisoners and Guards Puzzle*, Annual meeting of the Southeastern Section of the Mathematical Association of America, Austin Peay State University, Clarksville TN, March 2004

- *Evolving Mathematics with Technology*, Keynote address at the Valdosta State University Mathematics Technology Conference, Valdosta GA, February 2004

- *Controlling Limits for a Family of Quadratic Differential Equations*, Invited talk presented in Spelman College mathematics seminar, Atlanta GA, October 2001

- *Three Compartment Systems with Feedback Control*, International Conference on Technology in Collegiate Mathematics, November 2000

- *Creating Animated GIFs for the WWW with Maple*, Valdosta State University Mathematics Technology Conference, Valdosta GA, February 2000

- *Series Ideas Add Up to Interesting Mathematics*, Invited presentation at the annual meeting of the Georgia Council of Teachers of Mathematics, Rock Eagle GA, October 1999

Ionascu, Eugen

- MAA-SE meeting on March 16-17, 2007, talk titled "Maximum k-non-attacking sets of kings on chessboards via binary linear programming analysis"

- Twelfth Annual VSU Mathematics Technology Conference, February 23, 2007, Education Center Valdosta State University, talk titled "Calculating the number of equilateral triangles in {0, 1, ..., n}3"

- CSU Mathematics Colloquium, "Wavelet sets old and new", Columbus State university, October 26th 2006

- August 7-11, 2006, Concentration week in "Frames, Banach Spaces, and Signal Processing", Texas A&M University, College Station, TX

- May 18-20, 2006, Nineteenth Annual Cumberland Conference on Graph Theory, Combinatorics, and Computing, East Tennessee State University, Johnson City, Tennessee, talk about progress on "Bounds on the cardinality of a minimum 1/2-dominating set in the king's graph",

- November 2005, Talk at Columbus State University in the Max Club, "Equilateral triangles with integer coordinates in Rn".

- Tenth Annual Valdosta State University Mathematics Technology Conference, and delivered a talk with the title "Bounds on the cardinality of a minimum 1/2-dominating set in the king's graph"

- November 5th, 2004, Colloquium Talk at University of Auburn at Montgomery (MAM Seminar), Title: Maximal cardinality 4-dependent sets in 8-degree graphs and _-dominating sets

- February 2004, Attended the Ninth Annual Valdosta State University Mathematics Technology Conference, and delivered a talk with the title "Extreme values for the area of rectangles with vertices on concentrical circles",

- November 9-10, 2002, 982nd AMS Meeting, had a talk in the Special Session on Functional and Harmonic Analysis of Wavelets, Frames and their applications, Orlando, FL

- _August 6-9, 2002, IWOTA2002 Conference (Thirteenth International Workshop on Operator Theory and Applications), Blacksburg, Virginia, talk on the "Connectivity of wavelet sets"

Linton, Ron

- "On the Application of Genetic Algorithms to Research in Mathematics", Mathematics Colloquium at Western Kentucky University, November 14, 2002.

- "Sawing Genetic Algorithm Fitness Functions", Computer Science Colloquium at Georgia Southwestern University, October 18, 2002.

- "Managing Dynamic Fitness Functions in Genetic Algorithms," Computer Science Colloquium at West Georgia State University , April 18, 2002.

- "An Application of Genetic Algorithms to the Construction of Specific Finite Semigroups," Computer Science Colloquium, CSU, October 1, 1999.

- Gramling-Linton, Karen and Ronald Linton, "Hereditary and Cohereditary Group Properties," Kansas MAA, KATM, and KAMTTYC Joint Mathematics Spring Conference, Emporia, KS, March 12-13, 1993.

- "Effects of Data Modification on Short Term Forecasts," Annual Meeting of the Kansas-Western Missouri Chapter of the American Statistical Association, Kansas City, MO, June 16, 1990.

Muse, Brian

- TEAM-Math Conference, Presentation with Deborah Gober, Cindy Henning, and Kenneth Jones on Collaborative Initiatives to Improve Teacher Education, Tuskegee University (scheduled for August 24, 2007)

- Joint Meeting of MAA-SE & SIAM-SEA. Undergraduate Poster Presentation by Angel Gaskins of our work on The Duck Hunter Problem: A Comparison of Monte Carlo and Multinomial Theoretical Probability, Auburn University (2006)

- Joint Mathematics Meetings. Presentation of my research on nested pairs of orthogonal quadruple systems, 3-frames and conjugate orthogonal 3-quasigroups. Atlanta (2005)

- SIAM Conference on Discrete Mathematics. Presentation of my research on nested pairs of orthogonal quadruple systems, 3-frames and conjugate orthogonal 3-quasigroups. Nashville (2004)

- Discrete and Statistical Sciences Seminar. Presentation of my research on nested pairs of orthogonal quadruple systems, 3-frames and conjugate orthogonal 3-quasigroups. Auburn University (2004)

- Mathematics Seminar. Presentation of my research on nested pairs of orthogonal quadruple systems and 3-frames. Columbus State University (2004)

- Joint Meeting of MAA-SE & SIAM-SEA. Presentation of my research on nested pairs of orthogonal quadruple systems and 3-frames. Clemson University (2003)

- Discrete and Statistical Sciences Seminar. Presentation of my research on orthogonal quadruple systems. Auburn University (2002)

- Discrete and Statistical Sciences Seminar. Presentation of the _ = 2, n _ 4 mod 12 case from C. Lindner's and A. Rosa's research on the metamorphasis of _-fold block designs with block size four into _-fold triple systems. Auburn University (2002)

- Discrete and Statistical Sciences Advanced Combinatorial Design Theory Class. Presentation of the 10K + 6 case from C. Rodger's and E. Spicer's research on minimum coverings of Kv with copies of K4 - e which contain no proper subsystems. Auburn University (2002)
- Discrete and Statistical Sciences Advanced Algebraic Coding Theory Class. Presentation of K. Phelps's and I. Dejter's research on twisted perfect dominating sets and ternary perfect dominating sets. Auburn University (2001)
- Discrete and Statistical Sciences Advanced Graph Theory Class. Presentation of L. Stacho's research on new upper bounds for the chromatic number of a graph. Auburn University (2001)
- Discrete and Statistical Sciences Seminar. Presentation of my research on MacKay and Neal codes. Auburn University (2001)

Stancu, Alin

- Special Topics in Homological Algebra Drexel University, 2007.
- Hochschild Cohomology and Derived Categories Joint AMS/MAA Meeting, New Orleans, 2007.
- Higher Rank Numerical Values Drexel University, 2006.
- Relative Derived Categories and Hochschild Cohomology Drexel University, 2006.
- Derived Categories and Hochschild Cohomology Algebra seminar, University of Western Ontario, 2006.
- Hochschild Cohomology via Derived Categories Algebra -Topology seminar, University of Rochester, 2005.
- Derived functors and Hochschild Cohomology Algebra Seminar, SUNY at Buffalo, 2005.
- Matlis Duality University of Bucharest, 2000.
- Maximal Cohen-Macaulay modules University of Bucharest, 1999.

Tu, Renjin

- " Locally Asymptotically Optimal Designs for Testing in Logistic Regression" was presented at the 1999 Joint Statistical Meetings of the American Statistical Association, the International Biometric Society, The Institute of Mathematical Statistics, and the Statistical Society of Canada of Canada, in Baltimore, MD August 11, 1999
- "Comparison Between Confidence Intervals of Linear Regression Models With and Without Restriction" was presented at the 1997 Joint Statistical Meetings in Anaheim, California,August 12, 1997
- " Order Restricted Statistical Inference in Linear Regression " was presented at the 1993 Joint Mathematical Meetings in San Antonio, Taxes, January 16, 1993

WORKS IN PROGRESS
TENURED AND TENURE-TRACK FACULTY

Almada, Carlos

- *"An Elementary Approach to Least Squares"*, with Laura Nunley, in preparation to be submitted during Fall 07.
- *"The Hessian of a Harmonic Reduction"*, accepted for publication pending revisions in *Reports on Mathematical Physics*.
- "*Global weak Hyperbolic Harmonic Maps into Euclidean Spheres*", to be submitted.
- *"A Remark on a Result by Kato"*, to be submitted.
- "*Wave Maps on Globally Hyperbolic Manifolds"*, in progress.
- *"A Semi-linear Wave Equation On 3+1 Globally Hyperbolic Manifolds"*, in progress
- "*The Spherical Mean on Symmetric Spaces"*, in progress

Bhandary, Mahdusudan

- *Bhandary, M.and Fujiwara, K. (2007).* " An Exact Test for the Equality of Intraclass Correlation Coefficients under Unequal Family Sizes." Under revision for publication in *American Journal of Mathematical and Management Sciences.*
- Bhandary, M. (2007). "Test for Generalized Variance in the Linear Model When the Regression Parameters are Stochastic." Under revision for publication in *American Journal of Mathematical and Management Sciences.*
- Bhandary, M. and Doetcott, C. (2007). "Test for the Equality of AutoCorrelation Coefficients for Several Populations." Under revision for publication in *American Journal of Mathematical & Management Sciences.*
- "An alternative test for the equality of variances for several populations" (with **Dai H.**) Submitted to *Journal of Statistical Computation and Simulation.*
- "An alternative test for the equality of variances for several populations in Randomized Complete Block Design" (with **Dai H.**). Submitted to *Statistics and Probability Letters.*
- "Comparison of Several tests for combining several independent tests" (with Zhang X.) Submitted to *Journal of Statistical Computation and Simulation.*
- "On confidence interval of a common autocorrelation coefficient for two populations in multivariate data when the errors are autocorrelated". Submitted to *Statistics and Probability Letters.*
- "On confidence interval of a common autocorrelation coefficient for several populations in multivariate data when the errors are autocorrelated". Submitted to *Journal of Multivariate Analysis.*

- " Confidence Interval Estimation for a Difference in Intraclass Correlation Coefficients Under Unequal Family Sizes." (with Fujiwara K.). Submitted to *Canadian Journal of Statistics.*

- "Robust M-estimation of Number of Signals." Submitted to *Statistics.*

- "Detection of the Number of Signals in the Presence of Colored-Noise in Decentralized Processing" (with Ding W.). Submitted to *Journal of Applied Statistical Science*.

- "Detection of the number of defective components of outliers in signal processing" Submitted to *Journal of Statistical Research.*

- "Test for intraclass correlation coefficient under unequal family sizes" (with Fujiwara K.) Submitted to *Computational Statistics* .

- "Confidence interval for intraclass correlation coefficient under unequal family sizes" (with Fujiwara K.) Submitted to *Journal of Applied Statistical Science.*

- "Bayes Estimation of Intraclass Correlation Coefficients Under Unequal Family Sizes." (with K. Fujiwara).

- "Detection of Outliers in Complex Normal Distribution."

- "On exact $100(1-\alpha)\%$ confidence interval of autocorrelation coefficient in multivariate data when the errors are autocorrelated".

Dai, Hongying

- **Hongying Dai** and Richard Charnigo. "Outlier Detection and Inferences in Contaminated Regression Models", invited revision by *Sankhya*

- Madhusudan Bhandary and **Hongying Dai** "An Alternative Test for the Equality of Variances for several Populations", submitted to *Journal of Statistical Computing and Simulation.*

- Bernard Philip, Makin Carre, **Hongying Dai** "Variability of ASA Physical Status Class Assignment among Pediatric Sedation Practitioners", invited revision by *Pediatric Anesthesia*.

- Thitinart Sithisarn, Henrietta Bada, **Hongying Dai**, Christopher Reinhardt, David Randall, Sandra Legan, "Effects of Prenatal Oxycodone Exposure on the Stress Axis of Young Adult Rats", submitted to *Neurotoxicology and Teratology*.

- Jianqiang Hao, Arne. Bathke, Jerry. Skees, and **Hongying Dai** "Weather Risks, Ratemaking, and Modeling the Tail Distribution: An Application of Extreme Value Theory", Submitted to *American Journal of Agricultural Economics*.

- Joan Griffith, Jody Clasey, Jason King, Starr Gantz, **Hongying Dai**, Henrietta Bada. "Validation of Self-reported Physical Activity in Children"

- Jessica Croley, **Hongying Dai**, Joan Griffith. "Adolescents in Clinical Research: Strategies for Recruitment and Consent", submitted to *Journal of Clinical Research Best Practices*

Deng, Baiqiao

- B. Deng and C. Heil, "Nonstationary Subdivision and wavelets"
- B. Deng and Changbai Xiao, "On existence of Weyl-Heisenberg and affine frames for $L^2(R)$"
- B. Deng, "Average interpolation p-wavelets constructed by Haar systems",
- B. Deng, "Progressive wavelets on nonuniform nodes "

Henning, Cindy

- Henning, C. (In print: Expected Sept 2007). The Mathematical Preparation of Secondary Teachers: A Call for Research. *Journal of Mathematical Sciences and Mathematics Education*, 2(2).
- Henning, C. & Muse, W (submitted for publication 2006) Revising and assessing content courses for elementary teachers, *PMET Volume of the MAA Notes and Reports Series*.

Howard, Tim

- *Introduction to the Prisoners Versus Guards Game,* with David Woolbright and Eugen Ionascu, submitted January 2007.

Ionascu, Eugen

- P. Stanica and C. L. Frenzen, A proof of two conjectures related to Erd¨os-Debrunner inequality, accepted by J. Inequal. Pure and Appl. Math (July 2007)
- F. Luca, P.Stanica and H. Fredricksen, Minimal Niven numbers (I), submitted in August 2007.
- F. Luca, P.Stanica and H. Fredricksen, Remarks on a sequence of minimal Niven numbers, submitted in Septemebr 2007.
- Counting all equilateral triangles in {0, 1, 2, ..., n}3, submitted in January 2007.
- T. Howard and David Woolbright, Introduction to the Prisoners vs. Guards Puzzle, submitted (January 2007)
- F. Luca, P.Stanica and H. Fredricksen, Minimal Niven numbers (II)
- F. Luca and R. Obando, On the degenerate solutions of the Diophantine equation a2 + b2 + c2 = 3d2,
- On positivity of bivariate polynomials

- Twin problems from The AMM
- Bounds on the cardinality of a minimum ½-dominating set in the king's graph
- Differential Equations, lecture notes, http://www.math.gatech.edu/_ionascu, Number Theory, lecture notes, see webpage
- Wavelets sets in Rn associated with non-expansive dilation matrices,
- Calculus with emphasis on transcendental functions, lecture notes, see webpage

Linton, Ron

- Sandra Gaskins, Rebecca Klusmeier, Karen Linton, Ronald Linton, "Unions of Dominant Chains of Pair-wise Disjoint, Completely Isolated Subsemigroups" (in preparation)

Muse, Brian

- W. B. Muse, K. T. Phelps, Conjugate orthogonal 3-quasigroups. (in preparation)
- P. Morris, W. B. Muse, A comparison of Depakote ER and Valproic acid/Depakote DR in the treatment of prisoners with bipolar disorder. (in preparation)
- C. S. Henning, W. B. Muse, Revising and assessing content courses for elementary teachers. (submitted for publication in The PMET Volume of the MAA Notes and Reports Series) (2006)

Stancu, Alin

- A Model Category Structure on Presheaves of Algebras (in preparation).

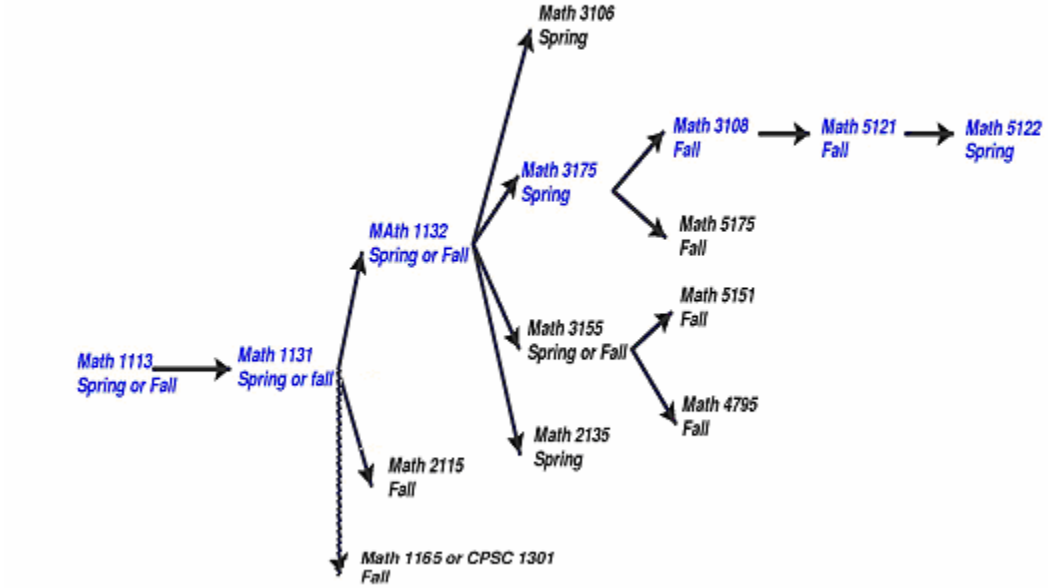
Tu, Renjin

- Eleven articles for *Encyclopedia of Epidemiology* were accepted by SAGE publications, and The *Encyclopedia* is scheduled to be published in the fall of 2007.

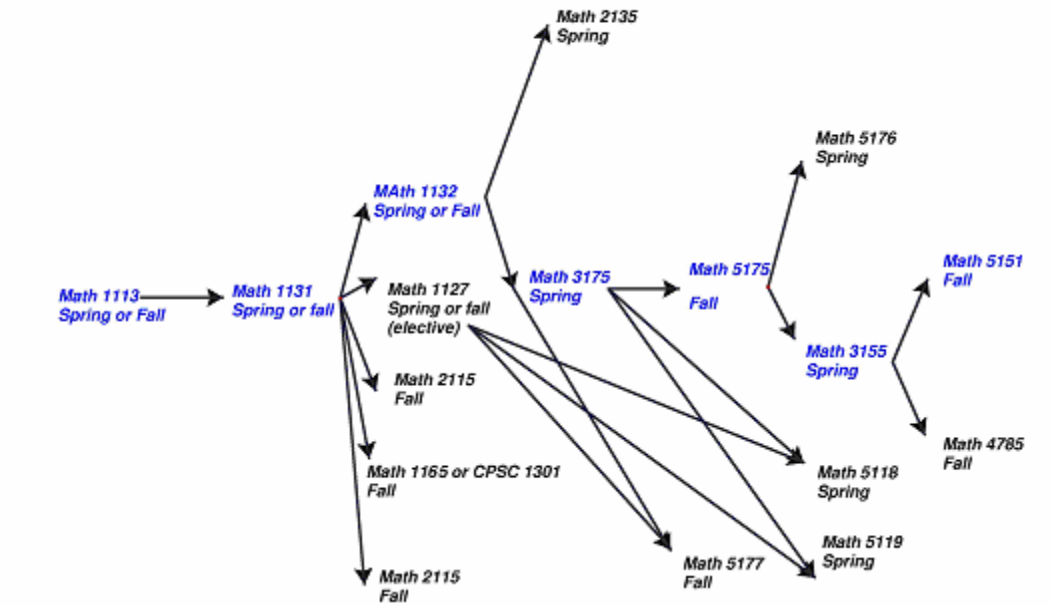
APPENDIX 3

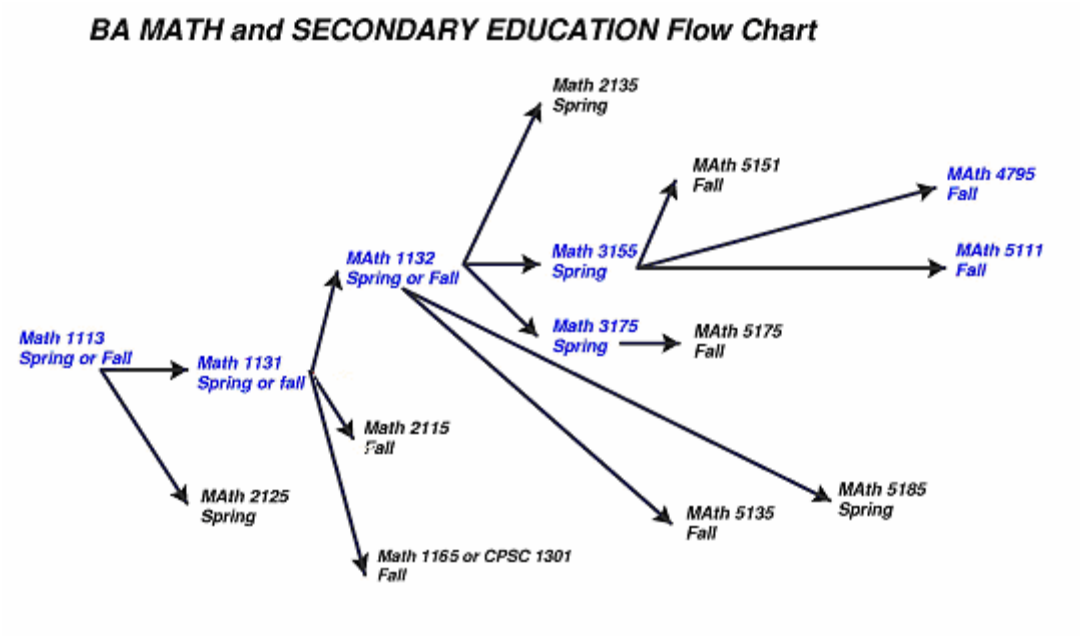
REQUIREMENT DIAGRAMS FOR TRACKS AND DEGREES IN THE PROGRAM

BS APPLIED MATH ACTUARIAL TRACK PREREQUISITE FLOW CHART



BS APPLIED MATH STATISTICS TRACK PREREQUISITE FLOW CHART




BA MATH and SECONDARY EDUCATION Flow Chart
Math 1113
Spring or Fall
Math 1131
Spring or fall
MAth 2125
Spring
MAth 1132
Spring or Fall
Math 2115
Fall
Math 1165 or CPSC 1301
Fall
Math 2135
Spring
Math 3155
Spring
MAth 5151
Fall
MAth 4795
Fall
MAth 5111
Fall
Math 3175
Spring
MAth 5175
Fall
MAth 5135
Fall
MAth 5185
Spring

APPENDIX 4

ENROLLMENT DATA SUPPLIED BY OFFICE OF VPAA

Department of Mathematics				
Programs: BA Mathematics, BA Mathematics & Secondary Education, and BS Mathematics				
Quantitative Measures				
Enrollment by Gender - Fall Semester				
BA Mathematics				
Female	6	4	8	6
Male	5	4	6	5
Total	*11*	*8*	*14*	*11*
BA Mathematics & Secondary Education				
Female	27	37	34	33
Male	18	15	18	17
Total	*45*	*52*	*52*	*50*
BS Mathematics				
Female	10	14	11	12
Male	12	9	14	12
Total	*22*	*23*	*25*	*23*
Combined Undergraduate Programs				
Female	43	55	53	50
Male	35	28	38	34
Total	*78*	*83*	*91*	*84*
Measure	**2004/05**	**2005/06**	**2006/07**	**3-Year Avg**
Enrollment by Ethnic Origin - Fall Semester				
BA Mathematics				
International Students	0	0	0	0
Asian	0	0	2	1
Black	2	1	2	2
Hispanic	0	0	0	0
American Indian	0	0	0	0
Multi-Racial	0	1	0	0
White	9	6	10	8
Total	*11*	*8*	*14*	*11*
BA Mathematics & Secondary Education				
International Students	0	0	1	0
Asian	0	0	0	0
Black	9	11	13	11
Hispanic	1	1	1	1
American Indian	0	0	0	0

Multi-Racial	1	1	1	1
White	34	39	36	36
Total	*45*	*52*	*52*	*50*
BS Mathematics				
International Students	0	0	2	1
Asian	0	0	0	0
Black	5	4	5	5
Hispanic	0	0	0	0
American Indian	0	0	0	0
Multi-Racial	2	2	4	3
White	15	17	14	15
Total	*22*	*23*	*25*	*23*
Combined Undergraduate Programs				
International Students	0	0	3	1
Asian	0	0	2	1
Black	16	16	20	17
Hispanic	1	1	1	1
American Indian	0	0	0	0
Multi-Racial	3	4	5	4
White	58	62	60	60
Total	*78*	*83*	*91*	*84*
Measure	**2004/05**	**2005/06**	**2006/07**	**3-Year Avg**
Number of Graduates by Ethnic Origin				
BA Mathematics				
International Students	0	0	0	0
Asian	0	0	0	0
Black	1	0	0	0
Hispanic	0	0	0	0
American Indian	0	0	0	0
Multi-Racial	0	0	0	0
White	0	0	0	0
Total	*1*	*0*	*0*	*0*
BA Mathematics & Secondary Education				
International Students	0	0	0	0
Asian	0	0	0	0
Black	1	0	0	0
Hispanic	0	0	0	0
American Indian	0	0	0	0
Multi-Racial	0	0	0	0

White	2	3	5	3
Total	*3*	*3*	*5*	*4*
BS Mathematics				
International Students	0	0	0	0
Asian	0	0	0	0
Black	0	0	0	0
Hispanic	0	0	0	0
American Indian	0	0	0	0
Multi-Racial	0	0	0	0
White	4	4	5	4
Total	*4*	*4*	*5*	*4*
Combined Undergraduate Programs				
International Students	0	0	0	0
Asian	0	0	0	0
Black	2	0	0	1
Hispanic	0	0	0	0
American Indian	0	0	0	0
Multi-Racial	0	0	0	0
White	6	7	10	8
Total	*8*	*7*	*10*	*8*
Measure	**2004/05**	**2005/06**	**2006/07**	**3-Year Avg**
Enrollment by Age - Fall Semester				
BA Mathematics				
Under 21	5	6	9	7
21 - 25	2	0	0	1
26 - 30	1	1	4	2
31 - 40	2	0	0	1
41 - 50	1	1	1	1
51 - 60	0	0	0	0
Over 60	0	0	0	0
Total	*11*	*8*	*14*	*11*
Average Age	*25*	*23*	*23*	*24*
BA Mathematics & Secondary Education				
Under 21	18	20	20	19
21 - 25	12	13	21	15
26 - 30	7	6	3	5
31 - 40	3	5	2	3
41 - 50	3	6	3	4
51 - 60	2	2	3	2

Over 60	0	0		0
Total	*45*	*52*	*52*	*50*
Average Age	*26*	*27*	*26*	*26*
BS Mathematics				
Under 21	8	7	7	7
21 - 25	8	12	14	11
26 - 30	1	2	3	2
31 - 40	1	0	0	0
41 - 50	3	1	0	1
51 - 60	1	1	1	1
Over 60	0	0	0	0
Total	*22*	*23*	*25*	*23*
Average Age	*26*	*24*	*23*	*24*
Measure	**2004/05**	**2005/06**	**2006/07**	**3-Year Avg**
Combined Undergraduate Programs				
Under 21	31	33	36	33
21 - 25	22	25	35	27
26 - 30	9	9	10	9
31 - 40	6	5	2	4
41 - 50	7	8	4	6
51 - 60	3	3	4	3
Over 60	0	0	0	0
Total	*78*	*83*	*91*	*84*
Average Age	*26*	*26*	*24*	*25*