



MATHEMATICS PROGRAM REVIEW

College of Arts and Sciences

Dakota State University
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Part 1: Institutional History

Heritage: 1881-1982

Dakota State University was established in 1881 as the first teacher education institution in Dakota Territory. Teacher education remained the primary mission of the institution through the 1950s. However, in response to the changing needs of South Dakota in the 1960s, the university began to expand its role to include degree programs in the liberal arts and business.

In 1980, South Dakota welcomed a major new industry into the state: the banking and credit card industry. The success and growth of this new industry, as well as the success of other information-oriented, computer-based industries in the state, prompted the state's leadership to carefully examine the degree programs being offered at the public institutions of higher education within the state. After lengthy discussions, leaders in state government, the banking and information services industries, and the Board of Regents agreed to develop new degree programs at one institution and then to use the experience and knowledge from this development to expand programs throughout the state's public higher education system.

Mission Change: 1983-84

In 1984, the Legislature of the State of South Dakota (South Dakota Codified Law 13-59-2.2) assigned Dakota State University the role and mission of developing technology-based degree programs in information systems, business, teacher education, and allied health care services at both the undergraduate and graduate levels. The Legislature provided \$2.6 million in additional operating funds to support a three-year mission change at DSU. During the initial phase of the transition, the academic programs of the institution were reviewed. Degree programs were phased out if they were duplicated at the other five regental institutions or if graduates would enter an over-supplied marketplace. New information systems programs, computer equipment, and facilities were approved for DSU. During the transition, special attention was given to ensure that all students in programs slated for phase-out received a full opportunity to complete those programs. To ensure the continuation of education quality, when the number of students continuing in a program became very small, a special faculty-mentoring program was developed.

The second phase of the transition began in August 1984, with the development of degree programs that integrated computers and information technologies into traditional academic subjects and added coursework specific to the computer and information systems areas. Existing faculty were retrained, and new faculty were hired. Programs to implement the research and service aspects of the new role and mission were started. This was a period of stress for the campus, but it was also a period of great exhilaration with faculty and staff invigorated and renewed by the need for innovation, adaptation, and change. Some faculty and staff were unable to adapt to the changing conditions and left the university, but those who stayed on for the ride were justly proud of their accomplishments. Realizing that the innovative programs being developed at DSU were expensive, private industry and state government provided the university with additional financial resources.

Consultants from state agencies and from national corporations also provided assistance and guidance that contributed greatly to the success of the mission change.

Since the Mission Change: 1984-Present

Today, the institution remains focused on the mission adopted in 1984. The curriculum in established degree programs is carefully scrutinized each year to ensure that it remains on the cutting edge relative to technology. When new degree programs are proposed by the colleges, they must clearly satisfy the “Is it compatible with our mission?” question before any additional planning is done. Improvements in equipment and facilities continue to be a high priority in the institution’s agenda. The institution initially provided training in both mainframe and desktop computing. In recent years, the emphasis switched first to desktop computing and more recently to encompass wireless, mobile, and tablet computing. With the addition of degree programs that emphasize information assurance and security issues, additional computer lab facilities have been added to the campus infrastructure.

Prior to the mission change, most DSU students lived within a 50-mile radius of the campus. Most were traditional students coming to the institution directly from high school. Since the mission change, the DSU audience and student population has changed markedly. Immediately after the mission change, enrollments plunged from 1,246 to 867 in two years – a frightening 27.6 percent decline the first year, followed by another 12.6 percent decline the second year. But the new curriculum changes, combined with new institutional vigor, provided the institution with unprecedented enrollment growth and stability. Since that rather rocky start, the institution’s enrollments have climbed, reaching 3110 in Fall 2012 (1727.7 FTE).

In 1999, the Higher Learning Commission of the North Central Association of Colleges and Schools (NCA) approved DSU’s request to add its first graduate program, a Master of Science degree program in information systems, to the curriculum. In 2000, a master of science in education degree program in computer education and technology was also approved by the Higher Learning Commission. (The program name for the Master of Science in education degree program has since been changed to educational technology.) In 2004, the Master of Science in Information Assurance was approved. In December 2005, the South Dakota Board of Regents authorized DSU to offer its first doctoral degree. The Master of Science in Health Informatics was approved in 2009 with the Master of Business Administration program getting approval in 2011. Of the 3,110 students enrolled at DSU in Fall 2012, some 2,872 students were enrolled at the undergraduate level; another 238 students were enrolled at the graduate level. This number reflects both degree-seeking students and special (non-degree seeking) students.

Throughout its 131 years, Dakota State University has had a proud heritage of preparing graduates to meet the needs of a changing society. Since 1881, the university has provided challenging academic programs in one of the best educational environments in the state. The continuation of this tradition of service is of prime importance to the faculty, students, staff, and administration of Dakota State University.

Accreditation History

Dakota State University was granted accreditation by the Higher Learning Commission for a period of ten years in 1961 and accreditation has been continued after each comprehensive visit. Since being accepted into the Higher Learning Commission's (HLC) Academic Quality Improvement Program (AQIP) in February 2005, DSU has participated in two strategy forums (November 2005 and February 2010), a systems appraisal in 2008-09 and again in 2012 and a Quality Check-Up Visit in October 2010. On February 20, 2011, the HLC's Institutional Actions Council (IAC) voted to continue the accreditation of Dakota State University through the AQIP process with the next reaffirmation in 2018-19.

College Mission

The College of Arts and Sciences offers a variety of programs and courses leading to many successful career paths. Computer technology is integrated throughout all majors. The College offers the vast majority of the general education courses, serving as a background for all degrees. Faculty in Speech and Theater, English, and Digital Arts and Design are principally located in Beadle Hall. Math, science and social science faculty are housed in the C. Ruth Habeger Science Center. The clinical faculty in the Respiratory Care Program are located at McKennan and Sanford Hospitals in Sioux Falls.

The College of Arts and Sciences offers degree programs in Biology, Computer Game Design, Digital Arts and Design, English, Mathematics, Physical Science, Professional and Technical Communication and Respiratory Care. In addition to these degree programs, the College of Arts and Sciences offers majors, minors, and courses which qualify students to apply for admission to professional schools and programs.

History of the Mathematics for Information Systems Program

The Math for Information Systems and Math Education degrees were established at the time of the institutional mission change in 1984-1985. These degrees fit well within the defined focus of DSU on computer integration into the curriculum and serving the needs of the K-12 education community. Maple, Stella, Excel, The Geometer's Sketchpad, WebAssign and MyMathLab are the primary software packages used in mathematics courses. They are all available to be loaded onto student tablets or accessible by students anywhere/anytime from the VM server (accessed through the internet to share computer software).

As previously noted, DSU implemented a wireless mobile computing initiative in the fall of 2004, mandating student leases of tablet PCs with a nominal user fee for all fulltime freshman and sophomores, and encouraging upperclassmen to opt into the lease. Most math majors opted into the program the first year and all students were required to have a tablet by the Fall of 07. Nearly all mathematics courses have an online presence utilizing an online course management system. These are examples of DSU's continuous efforts to incorporate the latest technology into the curriculum at the university and department level.

Date of Last Mathematics Program Review

The last institutional program review for the Mathematics for Information Systems degree was in November 2005.

Outcomes of the Last Mathematics Program Review

Dr. Worner listed the strengths of DSU's Mathematics programs as: (1) excellent faculty, (2) needs have been identified and strategies are in place, (3) graduates secure good employment opportunities, (4) excellent placement program for entry-level courses, (4) quality assessment plans, (5) technology integration, and (6) curriculum that supports students' earning double majors in Math for Information Systems and Computer Science.

Dr. Worner listed program limitations as: (1) ability to offer a wide variety of upper-level courses in a timely manner, (2) lack of a sequence of upper-level courses for majors, (3) low number of upper-division courses, resulting in students taking some upper-level courses before they are fully prepared to take the courses, and (4) no existing departmental leadership.

The strengths and limitations identified in the last review are still pertinent to the Mathematics for Information Systems program at DSU today. The greatest challenge continues to be that of recruiting a critical mass of students into the program so that the breadth and depth of courses can be offered in a timely fashion.

Part 2: Trends in the Discipline

The report by the MAA (CUPM Curriculum Guide 2004) on undergraduate programs emphasizes understanding the strengths and weaknesses of incoming students as well as their goals and aspirations. “Mathematics departments need to serve all students well – not only those who major in the mathematical or physical sciences.” (page 5, CUPM Curriculum Guide 2004)

Influence of Trends on Academic Programs

The use of technology has changed mathematics education. Students learn mathematics by doing mathematics and students that can do mathematics are successful in mathematics courses. Computer based course management systems and tools enable the collection and grading of daily assignments and quizzes. Faculty can check and verify that students are doing quality work without burying themselves under a mountain of paperwork as well as delivering course content efficiently. Not only has it changed the way in which faculty teach, but it has also changed what faculty teach. For example, graphing techniques used to be a major focus in both College Algebra and Calculus I, whereas today the topic is barely mentioned in modern textbooks. Handheld calculators and shareware computer programs (for example Graphcalc.com) provide all the information faculty and students need, not to mention the capabilities of computer algebra systems. DSU faculty use technology as a tool to solve and analyze problems throughout the curriculum.

All of the mathematics faculty have participated in curriculum redesign projects utilizing technology and in the development and offering of online courses within the Mathematics for Information Systems degree.

The regularly scheduled courses offered in the Mathematics for Information Systems program are courses that also serve as mathematical electives in the Computer Science program (to meet the 7-10 requirement).

Part 3: Academic Program and Curriculum

Academic Degrees Offered

The program leads to a Bachelor of Science in Mathematics for Information Systems. Additionally, majors in other programs may elect one of three mathematics minors: Applied, Business or Elementary Education. Most Computer Science students either double major in Mathematics for Information Systems or they obtain an Applied Mathematics or a Business Mathematics minor.

Curricular Options

Students majoring solely in Mathematics for Information Systems must complete 32 credits of mathematics coursework, 18 credits of supporting coursework leading to a minor in Information Systems, and 18-21 credits leading to a minor in Biology, Business Administration, Chemistry, Computer Forensics, Computer and Network Security, Computer Science or Physics.

Students obtaining a degree in Computer Science, Computer Game Design, Physical Science, Biology for Information Systems, or Biology Education only need to complete the 32 credit mathematics component of the program to obtain a second major in Mathematics for Information Systems.

Comparison with Other Regional Programs

Most colleges and universities in the region offer mathematics and math education degrees. All of the institutions in the South Dakota Board of Regents (SDBOR) system have mathematics programs and all, except the School of Mines and Technology, have math education programs. However, the math degrees at DSU are very different from the other SDBOR institutions because of the emphasis on the integration of computer technology and the information systems / computer science component. The double major option is unique within the SDBOR system and regionally St. Olaf is the only other school that seems to have a similar option.

Special Strengths of the Mathematics Program

Integration of Computer Technology

All of the mathematics faculty have an online presence, utilize an array of course management systems, and use a variety of computer software packages in their classrooms. The University has an unlimited site license for Fathom and The Geometer's Sketchpad so they can be installed on any University leased tablet. Maple and Stella are available anytime, anywhere on the VM server.

Interaction of Faculty and Students

One of the program's strengths is the focus on students and the opportunity for students and faculty to work closely together. The opportunity to interact frequently with students allows the faculty members to provide educational opportunities which more closely match the student's career goals.

Independent Study / Special Topics Courses

Faculty routinely offer Special Topics and Independent Study courses to students, helping them complete course requirements on a timely basis and offering courses that would not be offered due to low enrollment (the 7-10 rule) for students with a desire to learn about a specific topic. Given the constraints of the 7-10 rule, this allows us to provide breadth, depth and continuity to our curriculum that would not otherwise be possible. Below are the special topics offerings since Spring of 2008.

Year	Term	Course		Section	Topic	# Students
2008	Spring	MATH	491	D01	IS: Ecological Modeling	1
		MATH	492	D01	Top: Higher Algebra for Teachers	3
		MATH	492	D02	Top: Adv Discrete Math	6
2008	Fall	MATH	491	D01	IS: Mathematics of Games	2
		MATH	492	D02	Top: Geometry	3
2009	Spring	MATH	492	D01	Top: Linear Algebra	6
2009	Fall	MATH	492	D01	Top: Game Theory	4
		MATH	492	D02	Top: Algebra for Teachers	3
		MATH	492	D03	Top: Math Modeling	3
2010	Spring	MATH	491	D30	IS: Discrete Mathematics	1
		MATH	492	D01	Top: Geometry for Teachers	6
2010	Fall	MATH	492	D01	Top: History of Math	8
2011	Spring	MATH	491	D01	IS: Fdn of Math Education	3
		MATH	491	D02	IS: Inter. Diff. Eq.	1
2011	Fall	MATH	491	D01	IS: Abstract Algebra	2
2012	Spring				Nothing	
2012	Fall	MATH	291	D02	IS: Mathematics of Games	2
		MATH	291	D03	IS: Mathematics of Games	2
2013	Spring	MATH	492	D01	Top: Cryptology	13

Undergraduate Research

The mathematics program provides students with the opportunity to complete undergraduate research/scholarly projects and the Center of Excellence Honors Program (students earn a Center of Excellence minor) requires a Capstone Experience from the approved list or from the students' major. Past research has included modeling bird populations and computer simulation of foraging behavior (Dr. Jeffrey Palmer, advisor), finding Green's functions for boundary value problems associated to partial difference equations (Dr. Rich Avery, advisor), and graph coloring (Dr. Glenn Berman, advisor).

Supporting the System-wide Goals for General Education

The mathematics courses that satisfy the general education curriculum are designed with the goal of developing mathematical thinking and analytic communication skills. Students learn problem solving techniques, explore real world problems, form conjectures, and relate course content to the real world as well as other disciplines. In addition to being in the Mathematics for Information Systems degree, Math 123: Calculus I, Math 125: Calculus II, Math 225: Calculus III, Math 201: Introduction to Discrete Mathematics, and Math 281: Introduction to Statistics can also be used to satisfy the SDBOR general education mathematics requirement.

All general education mathematics courses at Dakota State University meet the following system (SDBOR) goal:

GOAL #5: Students will understand and apply fundamental mathematical processes and reasoning.

Student Learning Outcomes: As a result of taking courses meeting this goal, students will:

1. Use mathematical symbols and mathematical structure to model and solve real world problems;
2. Demonstrate appropriate communication skills related to mathematical terms and concepts;
3. Demonstrate the correct use of quantifiable measurements of real world situations.

Student Progression

An incoming student should take Math 123: Calculus I in the first fall semester when they meet the prerequisite (placement, trigonometry or concurrent enrollment in trigonometry), ideally fall of their first year. Then they should follow this with Math 125: Calculus II in the spring. Students should take Math 201: Introduction to Discrete Mathematics, Math 281: Introduction to Statistics, and Math 315: Linear Algebra during their second year. These courses develop a broad content background and level of mathematical maturity needed for most upper level mathematics courses and prepare students for Math 316: Discrete Mathematics during fall semester of their third year. During their third and fourth year students should enroll in upper-level electives that are available.

A student's academic record at DSU is accessible to his or her advisor through a web-based interface called WebAdvisor. Advisors and students can view schedules and transcripts. Also, they can perform a program evaluation that indicates which requirements remain in a student's program. WebAdvisor allows for online searching of courses, and students may register for classes after consulting with their advisor.

Curriculum Management

The Mathematics for Information Systems degree requirements (see Appendix A) consists of 32 credit hours of required mathematics coursework for all students in the program. Students whose only major is Mathematics for Information Systems must also complete 18 credits leading to a minor in Information Systems and 18-21 credits leading to a minor in an applied field. The mathematics coursework consists of a required 20 credit core (including Math 123: Calculus I which also satisfies a SDBOR General Education requirement) and an additional 12 credits of higher-level mathematics electives.

Enrollment numbers for the past 5 academic years are shown below. Math 120: Trigonometry (the prerequisite/co-requisite for Math 123: Calculus I) and Math 123: Calculus I have seen increasing demand in recent years most likely due to the growing interest in the Computer Game Design program on campus (these students must take Math 123: Calculus I as part of that program). Demand for Math 201: Introduction to Discrete Mathematics has experienced an even larger growth due to the popularity of the Computer and Network Security program at DSU.

Except for Math 315: Linear Algebra which was not offered during the 2011-12 academic year, all of the other required courses in the core (Math 123, Math 125, Math 201, Math 281, and Math 316) of the Mathematics for Information Systems degree are offered every year. At present Math 123, Math 201, and Math 281 are available both Fall and Spring every year. Courses in the elective block (Math 282 and all courses above Math 316) are offered on a rotating basis depending on demand – the goal has been to offer 1-2 of these higher-level electives each semester so that students have the opportunity to complete their degree requirements in a timely fashion.

Enrollment Statistics for Course Offerings

		2008-09	2009-10	2010-11	2011-12	2012-13
Math 120	Trigonometry	35	38	27	52	60
	Online	24	14	19	11	28
Math 123	Calculus I	39	28	34	45	55
	Online					18
Math 125	Calculus II	17	17	16	12	11
Math 201	Intro. to Discrete Mathematics	42	69	69	57	106
	Online		7	13	15	23
Math 225	Calculus III	11			20	
Math 281	Introduction to Statistics	25	28	33	33	41
	Online				13	16
Math 282	Mathematics of Games	2	10	18	20	22
Math 315	Linear Algebra	6	12	13		19
Math 316	Discrete Mathematics	13	19	14	17	16
	Online	26		4		15
Math 318	Adv. Discrete Mathematics		10			

		2008-09	2009-10	2010-11	2011-12	2012-13
Math 321	Differential Equations	16		9		
Math 361	Modern Geometry	3				
	Online		5		17	
Math 381	Intro. to Prob. and Statistics	17		12		11
Math 413	Abstract Algebra					
Math 418	Mathematical Modeling		3		13	
Math 471	Numerical Analysis I					
Math 475	Operations Research					

Relationships with Other Programs at Dakota State University

Computer Science majors are required to take Math 123: Calculus I, Math 201: Introduction to Discrete Mathematics, Math 281: Introduction to Statistics or Math 381: Introduction to Probability and Statistics, Math 316: Discrete Mathematics, and 6 credits of math electives – a total of 19 credits without which the Mathematics for Information Systems degree could not persist. These are largely the same students who populate the Mathematics for Information Systems degree program by electing to take advantage of our unique double major opportunity.

The Mathematics Education, Physical Science, Computer Game Design, Computer and Network Security and Biology for information Systems programs also support courses in the Mathematics for Information Systems program. However, without the support of the Computer Science program the mathematics program would not exist.

Instructional Methodologies

Faculty incorporate various instructional methodologies including but not limited to lecture, discussion, group problems, cooperative learning, directed reading, and multimedia supplemented with computer technology in their courses. Computer use in the classroom is highly encouraged. Additionally, the faculty has put a great deal of time and effort into creating documents and course materials that are accessible online and each has received course redesign grants principally for the development and/or revision of online courses.

Part 4: Program Enrollment and Student Placement

Data on program enrollments and graduation rates can be found in Appendix B. The number of declared Mathematics for Information Systems majors declined dramatically between Fall 2006 and Fall 2007 as the NSF funded Math and Science Technology Scholarship Program came to a close. Numbers have again increased the past two years most likely following the pattern of increasing enrollment in the Computer Science degree Program on campus and perhaps aided by the tight job market in recent years.

Employment Potential and Placement

Nearly 100% of graduates from the Mathematics for Information Systems program found placement in either an appropriate position or chose to continue their education in graduate school. The following table shows the positions and geographic locations of student (for whom data is available) placement since the last mathematics program review.

Term	Employer	Position	City
2005FA	Healthcare Medical Technology	Database Administrator	Sioux Falls
2005FA	Bureau of Info & Telecomm	Programmer/Analust	Pierre
2006SP	Continuing Education		
2006SP	Certus Managed Hosting Solutions	Academic Functionality Specialist	Sioux Falls
2006FA	Zuercher Technologies	Software Developer	Pierre
2007SP	USDA	Agricultural Statistician	Fargo
2007SP	Federated Insurance	Associate Programmer	Owatonna
2007SP	Eagle Creek Software	Siebel Consultant	Valley City
2007SP	Sencore	Technical Sales	Sioux Falls
2007SP	Continuing Education		
2007SP	Citibank	Programmer	Sioux Falls
2007SU	Innovative Systems	Software Developer	Mitchell
		Database	
2007FA	Secure Banking Solutions	Administrator/Programmer	Sioux Falls
2007FA	Continuing Education	DSU - MS.INFO	
2007FA	Garmin	Software Engineer	Olathe
2008SP	Precision Computer Systems	Technical Client Services Rep	Sioux Falls
2008SP	Continuing Education	DSU - MSIS (withdrew 9/08)	
2008SP	Continuing Education	Medical School	Des Moines
2008SP	Secure Banking Solutions	Software Developer	Madison
2008FA	US District Court	Systems Administrator	Pierre
2009SU	Continuing Education @ Univ of Iowa		
2010SP	EDCO	Programmer Analyst	Sioux Falls
2010SP	Innovative Systems	Software Developer	Mitchell
2010SP	USDA NASS	Math Statistician	Sioux Falls
2010SP	Secure Banking Solutions	Software Developer	Madison
2011SP	Continuing Education @ DSU		

Part 5: Faculty Credentials

The principal instructors in the Mathematics for Information Systems degree program are listed below.

- Jeffrey Palmer, Professor of Mathematics, Ph.D., Washington State University
- Rich Avery, Professor of Mathematics, Ph.D., University of Nebraska
- Glenn Berman, Associate Professor of Mathematics, Ph.D., Louisiana State University

A vita for each faculty member is contained in Appendix C.

Anticipated Changes in Staffing

There are no anticipated changes at this time. However, the mathematics program could almost certainly support another tenure track faculty position due to the increasing demand for support courses within the mathematics program (particularly Trigonometry, Calculus I, Introduction to Discrete Mathematics, and Introduction to Statistics) necessitated by the growth of the Computer Science, Computer and Network Security, and the Computer Game Design majors and the growth in online mathematics courses.

Faculty and/or Student Research

Dr. Rich Avery conducts research on boundary value problems and fixed point theorems. He has published over fifty refereed manuscripts in mathematics journals and co-authored a chapter in a book on time scales. His current research focuses on generalizations and extensions of the Leggett-Williams fixed point theorem. He is an editor for ISRN – Mathematical Analysis.

Dr. Glenn Berman conducts research in minors of directed graphs and coloring algorithms.

Dr. Jeffrey Palmer has research interests in the areas of mathematical epidemiology, foraging theory, and metapopulation dynamics. He has published several papers, has co-authored a book on the Birds of South Dakota, and has worked with numerous undergraduate students on research projects. Dr. Palmer is also the editor of the Seasonal Reports for South Dakota Bird Notes.

Service to Community

Dr. Avery is a member of the DSU Student Success committee and the Board of Regents Math Discipline council. He was also a member of the faculty-student communication task force (chaired this task force), the Starfish (early alert system) implementation Task Force on the DSU campus as well as for the Board of Regents, and he participated in discussions with the Board of Regents, the Department of Education and DIAL (delivers courses on the SD Virtual High School) in the delivery of a remedial math program to be offered to South Dakota High school students in their HS senior year or during the summer before attending college. Dr. Avery also reviews numerous (in the neighborhood of twenty per year) manuscripts for mathematics journals.

Dr. Berman currently serves on the Student Admission Committee. Previously he has served on the Diversity Committee, the parking committee, and the curriculum committee. Additionally he has helped with tutoring for assessment tests, proctored assessment tests, and advising of incoming freshman. He has also been the advisor of the Math and Science club, the DSU gaming club, and the forming DSU radio station, KDSU.

Dr. Palmer is currently the College of Arts & Sciences representative to the DSU Graduate Council and has served on numerous institutional committees over the years. He is a member of the statewide Mathematics Discipline Council and serves as Treasurer for the South Dakota Academy of Science. Additionally, Dr. Palmer is a Past President Director of the South Dakota Ornithologists' Union and continues to serve as Librarian (webmaster) and as a member of the Rare Bird Records Committee for that organization.

Part 6: Academic and Financial Support

Resources providing academic support to faculty and students in Mathematics include the Karl E. Mundt Library, a wireless computer infrastructure, and classrooms equipped with computer projection systems.

Karl E. Mundt Library & Learning Commons

The Karl E. Mundt Library & Learning Commons provides a wide range of library services as well as a diverse collection of reference and informational materials for the use of the faculty and staff of Dakota State University. The Library exists to serve as an archive of accumulated knowledge, a gateway to scholarship, and a catalyst for the discovery and advancement of new ideas. In fulfilling its obligation to provide knowledge to the University and the scholarly community at large, the Library collects, organizes, and provides access to recorded knowledge in all formats. The Library faculty initiates discussions and proposes creative solutions to the information challenges facing the University and the scholarly community. The Library's faculty and staff actively participate in providing quality service, access, instruction, and management of scholarly information. It is one of the main sources of knowledge and reference for students in mathematics.

The mission of the Karl E. Mundt Library & Learning Commons is to meet the information needs of the students, faculty, and staff of Dakota State University and to support the University's stated mission and goals. The college and library faculty work together to plan the development of library resources in order to purchase the most appropriate materials to achieve the educational objectives of Dakota State University. The total collection contains approximately 175,000 items (physical and electronic), ranging from books, journals, and other formats that support all subjects the University offers.

The Karl E. Mundt Library boasts tremendous access to the resources needed by anyone pursuing a mathematics related research topic. Librarians maintain an up-to-date Mathematics Resource guide (<http://dsu.libguides.com/science-and-math>) that acts a self-paced tutorial in locating relevant resources. Even though the library does not have an extensive list of books related to mathematics, they are readily obtainable through interlibrary loan. The library also has subscriptions to 115 full text online publications in the mathematical sciences, plus access to citation/abstract information in MathSciNet (1799 journals), Dissertation Abstracts, and other research databases. The Library tracks periodical and research database usage and subscribes to titles most in demand.

These and additional resources are available through a variety of means: the South Dakota Library Network (SDLN), EBSCO Academic Search Premier, ProQuest Research Library, OCLC FirstSearch, the Internet, and the various indexes accessed by the Mundt Library. In short, there is little the Library cannot acquire to fill student or faculty needs.

Computer Infrastructure

Information Technology Services (ITS) advances the mission of DSU by ensuring reliable core systems and network infrastructure, excellent technology support, and assisting technology integration into the curriculum and business processes. Information Technology Services is responsible for the planning, management, and direction of technology initiatives in support of both academic and administrative operations at DSU. ITS staff provide the campus community with a diverse set of technology services including:

Development, monitoring, and maintenance of the campus data network;

- Help desk and tablet repair services;
- Computer lab and server management;
- Administrative application development;
- Website and web application development services;
- Academic technology training and assistance;
- Multimedia services.

Working in partnership with the colleges and the institution's academic support areas, Information Technology Services develops the image of applications installed on student tablets. ITS staff operate a help desk and repair center, staffed primarily by students, to quickly respond to any computing or network access problems in campus offices or computing laboratories or with students tablet pc's.

Advisory and Support Staff

- Benjamin F. Jones, Dean of Arts and Sciences
- Dale Droge, Math and Science Coordinator
- Ethelle Bean, Director of the Library
- Peg O'Brien, Director of Extended Programs
- Nancy Presuhn, Senior Secretary for the College of Arts and Sciences
- David Overby, Chief Information Officer
- Craig Miller, Computing Services Manager - Network Services
- Brent Van Aartsen, Director of Web Services

Financial Support

There are two sources of funds that support the mathematics program. State funds are used for general operating expenses of the Science Center and support of instruction including printing, office supplies, and some support of travel. The funds in this account are shared by Biology, Mathematics, Physical Science and Respiratory Care.

Additional support for professional development and training is provided from funds allocated through the Vice-President for Academic Affairs office. Faculty may apply for support and up to \$1200 per year is available for each faculty member.

In addition there have been opportunities through E-Education Services to apply for support during the summer months to redesign courses.

Budget for Math and Science Programs 2007-2012

Fiscal Year	State Funds	Local Funds	Total
2007-08	\$65,106.00	\$30,000.00	\$95,106.00
2008-09	\$66,176.00	\$30,000.00	\$96,176.00
2009-10	\$120,106.00*	\$30,700.00	\$150,806.00
2010-11	\$66,600.00	\$30,000.00	\$96,600.00
2011-12	\$63,850.00	\$57,000.00**	\$120,850.00
2012-13	\$61,858.00	\$32,000.00	\$93,858.00

* \$55,000 budget addition for audio production lab

** \$ 9,016 reimbursed for previous chemical waste pickup

** \$16,000 deposited some carry over funds to be used for equipment

Major Financial Concerns

It is expected that state support of the College of Arts and Sciences, and therefore of the mathematics program, will continue at current levels. We have all of the resources that we have requested, including the site license for the most current version of Geometer's sketchpad and Stella. At this time there are no concerns.

Part 7: Facilities and Equipment

Current Facilities

The Science Center at Dakota State contains two mathematics classrooms, each with a capacity of 36 people, the Mathematics Success Center (used for remedial mathematics courses), two seminar rooms, a 111 seat auditorium, two chemistry laboratories, one physics lecture/lab room, and three biology laboratories.

Quality of the Facilities

The Science Center was renovated in 2009-2010. Consequently the laboratories, classrooms and offices are well maintained and are very serviceable.

Additional Facilities Needed

No additional facilities are needed at this time.

Quality of Current Equipment

Faculty at Dakota State University received a new computer with a memory upgrade on a regular basis. The equipment and software used by the faculty is up to date.

Additional Equipment Needed

At this time we have all the equipment and software we have requested and need for the delivery of our program.

Part 8: Assessment and Strategic Plans

Brief History

Assessment of program quality and student outcomes is an important component of program enhancement in the Mathematics for Information Systems Program at Dakota State University. The faculty in this program developed assessment plans which include student learning outcomes evaluated by multiple measures. The common set of assessment measures include the following direct and indirect measures: standardized exams, course grades, placement statistics, graduate surveys, and employer surveys. Faculty annually review assessment data and recommend changes for improvement, if necessary. The complete assessment plans, summary analysis and changes for improvement are available at <http://www.dsu.edu/academics/assessment/academic-assessment/major-field-undergrad-table.aspx>.

In addition to the annual faculty review of assessment results in each major, the Dean of the College of Arts and Sciences provides a report to the Assessment Coordinating Committee each fall. This report summarizes the significant finds based on assessment data and summarizes the proposed program improvements and is also available at the above site (see Annual Reports).

Goals and Objectives of the Mathematics for Information Systems Program

All students will have a basic knowledge of the fundamental principles and applications of mathematics. More specifically,

1. Students will understand the methods and important concepts of the major disciplines within mathematics.
2. Students will be able to apply their knowledge of mathematics to solve new and unfamiliar problems.
3. Students will be proficient in the use of computer technology to find information, acquire and analyze data, explore and understand mathematical concepts, investigate and solve complex mathematical problems, and communicate results and conclusions.
4. Students will be able to communicate their knowledge and results effectively for a wide range of purposes and intended audiences.
5. Graduates of the program will be prepared to enter graduate school to further their career goals in mathematics or related areas.
6. Graduates of the Mathematics for Information Systems program will be able to gain employment in business and industry where an understanding of the world of business, information systems, mathematics, and related areas is required or desirable.

Evaluation of Assessment Data

All candidates for graduation complete an assessment activity prior to graduation. Since 1998, all Mathematics for Information Systems majors take the Major Field Assessment Exam (MFAT) in Mathematics. Double majors in Computer Science also complete the MFAT in Computer Science. Both are produced by Educational Testing Service. DSU students' average score has remained within one standard deviation of the national user norm. In addition, the majority of the DSU students score at or above the 50th percentile when compared to the user norms. The MFAT in Computer Science provides assessment indicators in three areas: 1) programming fundamentals, 2) computer organization, architecture and operating systems and 3) algorithms, and theory and computational math. The average scores of the DSU students are also within one standard deviation of the user norms on each of the assessment indicators.

The Office of Institutional Effectiveness and Assessment has additional information on the Employer and Graduate Surveys and the major-field assessment tests.

ETS Major Field Assessment Test (MFAT) in Math	Fall 2007-Spring 2008	Fall 2008-Spring 2009	Fall 2009-Spring 2010	Fall 2010-Spring 2011	Fall 2011-Spring 2012	Fall 2012-Spring 2013	Overall Mean and Std. Dev.	One standard dev. from the user norms mean
DSU Math for Information Systems	N=7 159.0	N=2 160.5	N= 4 142.3	N=2 143.0	N=4 152.5	N=7 152.0	N=26 152.5 / 13.0	N=22/26 85%
User Norms							N=13279 156.5 / 18.2	

* includes double majors in Math for Information Systems / Computer Science

Evaluation of Curriculum Using Assessment Findings

The monitoring of student progress is a critical component of program assessment and provides the faculty, students and administrators with vital information about program quality. The curriculum is reviewed on a regular basis and program modifications are submitted to the University's Academic Council and Curriculum Committee. Information from graduate and employer surveys and meetings with prospective employers are used to revise the curriculum to ensure it meets the needs of the marketplace. Students' scores on the major field assessment exams are used as another means of evaluating the curriculum.

DSU regularly conducts several surveys that provide information for faculty and administrators to use in the evaluation of the effectiveness of the teaching and learning process. The Noel Levitz Student Satisfaction Inventory (SSI), the National Survey of Student

Engagement (NSSE) and the Faculty Survey of Student Engagement (FSSE) provide valuable information on student satisfaction with DSU's programs and services and the level of engagement of students in various areas. A summary of the results of the NSSE/ FSSE is presented to the faculty and staff during orientation in the fall. Each college receives the results of the Student Satisfaction Inventory for students in their majors; this data provides information on satisfaction with academic advising, course scheduling and other areas related to students' academic success.

DSU graduates are surveyed at one and three years following graduation. Employers of DSU graduates are surveyed on an annual basis. Ratings from employers of the graduates in math for information and math education were very high in several areas. For example, 100% of the employers were very satisfied or satisfied with DSU graduates "ability to learn on the job" and "knowledge of academic area as it relates to his/her position".

Students evaluate the teaching / learning process each semester in each class using the IDEA Student Ratings of Instruction Survey.

Interrelationships between major-field curriculum and General Education: :

- system-wide general education core requirements and proficiency testing
- institutional graduation requirements
- institutional technology / literacy requirements and proficiency testing

DSU monitors students' academic progress through the three-tiered assessment program: upon entry into the University, after completion of 32 or 48 credit hours (general education assessment) and during the semester in which they graduate (major-field assessment). Incoming students are evaluated using ACT or COMPASS scores to place them into the appropriate entry-level courses. Students' general education knowledge is evaluated after completion of 32 credit hours for associate degrees or 48 credit hours for baccalaureate degrees. During selected days in March and November, students complete the ACT CAAP proficiency testing in math, reading, English and science reasoning. In addition, all DSU students complete an online computer exam developed by DSU's faculty in the College of Business and Information Systems. Students in the Math for Information Systems major had higher scores than the national norms in the ACT CAAP Math exam.

Strategic Plan of Dakota State University 2007-2014

Introduction

Dakota State University is a public, mission-driven institution. It is South Dakota's designated information technology university and is a leader in integrating this technology into the academic disciplines of its curriculum. Academic rigor and the infusion of information technology into teaching, research, and creative activity are at the heart of the university's work.

Vision (2014)

DSU has a broad national reputation for providing a dynamic, information technology rich learning and research environment.

Values and Commitments

Dakota State University's 2007-2014 strategic plan reflects the following set of values and shared commitments to:

1. An uncompromising passion for DSU's information technology mission.
2. The use of data-informed decision making to improve and enrich the university's programs.
3. Academic research that produces adapts and incorporates new discipline- and pedagogy-based knowledge.
4. An unwavering support for student success and learning by promoting active engagement and creative problem-solving.
5. A relentless pursuit of emerging technologies.
6. Effective communication that is open and honest.
7. A university experience that promotes an understanding of our diverse world.
8. Cutting-edge academic programs focused on its information-technology mission.

Where We Are Now

Dakota State University provides students with an open, friendly, safe, challenging, and collaborative environment. The university encourages all students to participate in activities that enrich their academic experience, such as participation in extra-curricular activities, research, and outreach. Its faculty and staff are high-quality, caring, and student-focused. In 1881 the university began as the teacher education institution for the entire Dakota Territory. It continues to fulfill that mission and at the same time integrate the use of information technology in the education of teachers. Dakota State University is proud to be recognized by both the National Security Agency (NSA) and the Department of Homeland Security as a National Center of Excellence in Information Assurance Education. In December 2005, the South Dakota Board of Regents authorized DSU to offer its first doctoral degree. The institution is proud of its graduates, the high job placement levels that they achieve, and their frequent choices to remain in the state to build South Dakota's economic base and quality of life.

The University has concluded the successful implementation of its 2007 – 2014 strategic plan. Details regarding active and planned initiatives that grew and resulted from the 2007 -2014 Strategic Plan are available on our campus web site at <http://138.247.65.57/academics/assessment/institutional-effectiveness/index.aspx>

Focus

Through a strategic planning process, DSU has developed seven overarching goals for the University.

1. Expand current information technology leadership through cutting-edge programs.
2. Optimize on-campus student enrollment and enhance program quality by attracting high-ability students.
3. Increase student retention and graduation by providing an exceptional student experience.
4. Advance DSU's emphasis on applied research.
5. Extend DSU's educational outreach through online and alternative-location delivery.
6. Promote increased visibility and recognition of the University.
7. Develop new sources of revenue.

Strategic Goals of the College of Arts and Sciences

The College of Arts and Sciences has produced a plan that encompasses the DSU strategic initiatives, but focuses on how the goals and objectives will be addressed at the college level.

Appendix A: Mathematics for Information Systems Degree

Mathematics for Information Systems, B.S.

Graduates of the Mathematics for Information Systems program will have backgrounds in mathematics, business and information systems. These students take a variety of mathematical analysis courses including calculus, probability and statistics, and mathematical modeling. In addition, these students take a variety of computer and business related courses including computer programming, operating systems, data base applications, and business.

Students with this degree will enter the job market as business people with quantitative skills. Students will be hired by major businesses that need statistical analysis of both business and mathematical natures.

System-wide General Education Requirement (30 Credits)

Majors must take MATH 123 as part of the System-wide General Education Requirement.

Institutional Graduation Requirement (11 Credits)

Majors must take CIS 130 as part of the Institutional Graduation Requirement.

Mathematics Component (28 Credits)

Students obtaining a degree in Computer Science, Computer Game Design, Physical Science, Biology for Information Systems or Education in Biology, only need to complete the Mathematics Component of the program to obtain a second major in Mathematics for Information Systems.

- MATH 125 - Calculus II 4 credits
- MATH 201 - Introduction to Discrete Mathematics 3 credits
- MATH 281 - Introduction to Statistics 3 credits
- MATH 315 - Linear Algebra 3-4 credits (3 credits required)
- MATH 316 - Discrete Mathematics 2-3 credits (3 credits required)

Plus 12 credits from the following (12 Credits)

- MATH 225 - Calculus III 4 credits
- MATH 282 - Mathematics of Games 3 credits
- MATH 318 - Advanced Discrete Mathematics 3 credits
- MATH 321 - Differential Equations 3-4 credits (3 credits required)
- MATH 361 - Modern Geometry 3 credits
- MATH 381 - Introduction to Probability and Statistics 3-4 credits (3 credits required)
- MATH 413 - Abstract Algebra I 3 credits
- MATH 418 - Mathematical Modeling 3 credits
- MATH 471 - Numerical Analysis I 3 credits
- MATH 475 - Operations Research 3 credits

- MATH 492 - Topics 1-6 credits *
- MATH 498 - Undergraduate Research/Scholarship 1-6 credits (2 credits required)

* May be repeated several times provided student does not enroll in the same topics course.

Support Courses Component (18 Credits)

- CIS 251 - Business Applications Programming 3 credits
- CIS 325 - Management Information Systems 3 credits
- CIS 332 - Structured Systems Analysis and Design 3 credits
- CIS 350 - Computer Hardware, Data Communications and Networking 3 credits
- CIS 484 - Database Management Systems 3 credits
- CIS/CSC Elective 3 credits

Minor (18-21 Credits)

Students choose from one of the following minors:

Biology Minor

Business Administration Minor

Chemistry Minor

Computer Forensics Minor

Computer and Network Security Minor

Computer Science Minor

or

Physics Minor

Electives (12-15 Credits)

One of these credits will have been met upon completion of MATH 123 as part of the System-wide General Education Requirements.

Appendix B: Enrollment Data

Total Enrollment

Program enrollment is based on the number of students enrolled in at least one DSU class with an active program of Math for Information Systems as of fall census. If a student is dually enrolled in a program, they will be counted in both programs.

College enrollment is based on the number of students enrolled in at least one DSU class with an active program in the College of Arts & Sciences as of fall census. If a student is dually enrolled in a college, they will be counted in both colleges (CSC -BIS & Math - AS). However, if a student has multiple active programs in the same college, they will only be counted once at the college level.

University enrollment is based on the number of students enrolled in at least one DSU class as of fall census. If a student is enrolled in multiple programs, they are only counted once at the university level.

Table 1: Program, College, and University Enrollments

	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Math for Info. Systems	33	26	13	13	10	9	17	18	20
College of Arts & Sciences	582	570	592	674	487	575	506	489	465
University Enrollment	2329	2439	2570	2780	2861	3101	3102	3110	3129

Table 2: Student Diversity – Gender & Ethnicity for the Math for Information Systems Program

Math for Info. Systems	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Gender									
Female	4	5	5	2	1	0	4	3	3
Male	29	21	8	11	9	9	13	15	17
Ethnicity									
White	32	26	12	12	10	9	16	17	19
Non-White	1	0	1	1	0	0	1	1	1

Degrees Awarded

This table includes the number of degrees awarded by academic year.

Table 3: Number of Degrees Awarded by Academic Year

	SU05, FA05 & SP06	SU06, FA06 & SP07	SU07, FA07 & SP08	SU08, FA08 & SP09	SU09, FA09 & SP10	SU10, FA10 & SP11	SU11, FA11 & SP12	SU12, FA12 & SP13	Total Degrees Awarded
Math for Info. Systems	8	9	8	1	5	1	4	7	43

An academic year is defined as summer, fall, and spring for the purpose of this report.

Persistence

Persistence is defined as: The proportion of a student cohort who enrolled for the first time in a given fall semester and then re-enrolled in a subsequent spring semester. The student must be enrolled in at least one DSU class to be considered persisted. For persistence purposes, a specific population is used: first-time, full-time, baccalaureate degree-seeking freshmen. A student may be counted more than once. If the student is a double major, they will be counted in each major.

Table 4: Persistence Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen

	2005 Cohort		2006 Cohort		2007 Cohort		2008 Cohort		2009 Cohort		2010 Cohort		2011 Cohort		2012 Cohort	
	N	% Ret. 2 nd semester (SP06)	N	% Ret. 2 nd semester (SP07)	N	% Ret. 2 nd semester (SP08)	N	% Ret. 2 nd semester (SP09)	N	% Ret. 2 nd semester (SP10)	N	% Ret. 2 nd semester (SP11)	N	% Ret. 2 nd semester (SP12)	N	% Ret. 2 nd semester (SP13)
Math for Info Syst.	1	100.0%	4	100.0%	2	100.0%	1	100.0%	0	n/a	0	n/a	2	100.0%	1	100.0%

N=total number of students

% Ret 2nd semester = the percentage of students from the cohort who registered for at least on DSU class in the subsequent spring.

Retention

Retention is defined as: The proportion of a student cohort who enrolled for the first time in a given fall semester and then re-enrolled in a subsequent fall semester. The student must be enrolled in at least one DSU class to be considered retained. For retention purposes, a specific population is used: first-time, full-time, baccalaureate degree-seeking freshmen. A student may be counted more than once. If the student is a double major, they will be counted in each major.

Table 5: Retention Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen

	2005 Cohort		2006 Cohort		2007 Cohort		2008 Cohort		2009 Cohort		2010 Cohort		2011 Cohort		2012 Cohort	
	N	%Ret. 2 nd year (F'06)	N	%Ret. 2 nd year (F'07)	N	%Ret. 2 nd year (F'08)	N	%Ret. 2 nd year (F'09)	N	%Ret. 2 nd year (F'10)	N	%Ret. 2 nd year (F'11)	N	%Ret. 2 nd year (F'12)	N	%Ret. 2 nd year (F'13)
Math for Info. Systems	1	100.0%	4	100.0%	2	100.0%	1	100.0%	0	n/a	0	n/a	2	100.0%	1	100.0%

N=total number of students

% Ret 2nd year = the percentage of students from the cohort who registered for at least on DSU class in the subsequent fall.

Graduation

Graduation is defined as the number of the first-time, full-time, baccalaureate degree-seeking freshmen who enrolled at DSU in the fall and received a baccalaureate degree from DSU within five or six years. If a student graduated with an associate degree, they are counted as not graduated. A student may be counted more than once. If the student is a double major, they will be counted in each major.

Table 6: Graduation Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen in B.S. in Math for Info. Systems (Fall 2003 to Fall 2006 Cohorts)

Fall 2003					Fall 2004					Fall 2005 Cohort					Fall 2006 Cohort				
Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years		Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years		Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years		Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years	
	N	%	N	%		N	%	N	%		N	%	N	%		N	%		
8	6	75.0	6	75.0	2	2	100.0	2	100.0	1	1	100.0	1	100.0	4	3	75.0	3	75.0

For the 2002 Cohort, there were no first-time, full-time, baccalaureate degree-seeking freshmen with a declared program of Math for Information Systems

N=total number of students

% = the percentage of students from the cohort who graduated.

Table 7: Graduation Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen in B.S. in Math for Info. Systems (Fall 2007 Cohort)

Fall 2007				
Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years	
	N	%	N	%
2	2	100.0	2	100.0

Appendix C: Faculty Vitas

Richard I. Avery

College of Arts and Sciences, Dakota State University

<http://www.homepages.dsu.edu/averyr/>

EDUCATION:

Doctor of Philosophy in Mathematics

December 1997, University of Nebraska-Lincoln

Research Area: Difference Equations (Boundary Value Problems)

Advisor: Professor Allan Peterson

Master of Science in Mathematics

May 1996, University of Nebraska-Lincoln

Master of Arts in Teaching Secondary Education

May 1992, University of New Hampshire

Bachelor of Science in Mathematics Education, Magna Cum Laude

May 1991, University of New Hampshire

TEACHING EXPERIENCE:

Fall 2008 to present

Professor of Mathematics

College of Arts and Sciences, Dakota State University

Fall 2003 to Summer 2008

Associate Professor of Mathematics

College of Arts and Sciences, Dakota State University

Fall 1998 to Summer 2003

Assistant Professor of Mathematics

College of Natural Sciences, Dakota State University

Fall 1997 to Spring 1998

Visiting Assistant Professor of Mathematics

Department of Mathematics and Statistics, Utah State University

Fall 1994 to Summer 1997

Graduate Teaching Assistant

Department of Mathematics and Statistics, University of Nebraska-Lincoln

Fall 1993 to Spring 1994

International Baccalaureate Mathematics Teacher

St. John's School, Tumon Bay, Guam

PUBLISHED RESEARCH PAPERS IN REFEREED JOURNALS:

A Leggett-Williams Type Theorem Applied to a Fourth Order Problem, Communications in Applied Analysis, Volume 16 (2012), Number 4, 579-588, (with P. Eloe and J. Henderson).

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1-12, ISSN: 1072-6691, (with D. O'Regan and J. Henderson).

A Combinatorial Approach to Discrete Diffusion on a Segment,
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CHAPTER CO-AUTHOR:

Advances in Dynamic Equations on Time Scales, Birkhauser, Boston, 2003,
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Davis, J. Henderson and W. Yin).

PROFESSIONAL PRESENTATIONS:

1074th American Mathematical Society Meeting,
Multiple Fixed Point Theorems Utilizing Operators and Functionals of Leggett-Williams Type,
University of Nebraska - Lincoln, October 16, 2011.

1051st American Mathematical Society Meeting,
An Extension of the Leggett-Williams Fixed Point Theorem,
Baylor University, October 17, 2009.

MAA Nebraska/Southeast South Dakota Section Meeting,
Correlated Random Walks,
Dana College, March 31, 2006.

1011th American Mathematical Society Meeting,
*An Extension of the Fixed Point Theorem of Cone Expansion and Compression of Functional
Type,*
University of Nebraska-Lincoln, October 22, 2005.

MAA Nebraska/Southeast South Dakota Section Meeting,
Discrete Diffusion on a Strip,
University of Nebraska - Lincoln, April 2, 2005.

MAA Nebraska/Southeast South Dakota Section Meeting,
Discrete Centered Laplacian,
University of Nebraska – Kearney, April 2, 2004.

Sixth Annual Regional Workshop in the Mathematical Sciences
Partial Difference Equations,
University of Nebraska – Lincoln, November 8, 2003.

MAA Nebraska/Southeast South Dakota Section Meeting,
A Fourth Order Boundary Value Problem,
University of South Dakota, March 28, 2003.

Fifth Annual Regional Workshop in the Mathematical Sciences,
p-Laplacian Boundary Value Problems,
University of Nebraska-Lincoln, October 26, 2002.

Fourth Annual Regional Workshop in the Mathematical Sciences,
Iteration and Partial Difference Equations,
University of Nebraska-Lincoln, November 3, 2001.

MAA Nebraska/Southeast South Dakota Section Meeting,
Finding the Green's Function for a Discrete Diffusion Equation,
Doane College, March 30, 2001.

Third Annual Regional Workshop in the Mathematical Sciences,
Fixed Points and Solutions of Boundary Value Problems,
University of Nebraska-Lincoln, October 28, 2000.

Midwest Differential Equations Conference,
Twin Positive Fixed Points of Nonlinear Operators on Ordered Banach Spaces,
Concordia College (Moorhead, Minnesota), October 20, 2000.

MAA Nebraska/Southeast South Dakota Section Meeting,
An Extension of the Five Functionals Fixed Point Theorem,
Nebraska Wesleyan University, April 28, 2000.

953rd American Mathematical Society Meeting,
Improvements to the Leggett-Williams Fixed Point Theorem,
University of Notre Dame, April 8, 2000.

Second Annual Regional Workshop in the Mathematical Sciences,
Existence of Solutions to a Discrete Lidstone BVP,
University of Nebraska-Lincoln, November 20, 1999.

Third International Conference on Dynamic Systems and Applications,
Multiple Positive Solutions of a Partial Difference Equations,
Morehouse College, May 26, 1999.

Regional Workshop in the Mathematical Sciences,
The Green's Function for a Partial Difference Equation,
University of Nebraska-Lincoln, February 27, 1999.

Mathematical Sciences Colloquium,
Existence of Solutions to Discrete Boundary Value Problems,
University of South Dakota, October 21, 1998.

Third Midwest-Southeastern Atlantic Joint Regional Conference on Differential Equations,
Multiple Positive Solutions to a Discrete Second Order Conjugate BVP,
Vanderbilt University, November 8, 1997.

Rocky Mountain Mathematics Consortium,
Three Positive Solutions to a Discrete Second Order Conjugate BVP,
University of Wyoming, July 16, 1997

Conference on Applied Mathematics,
Multiple Positive Solutions of an n th Order Focal BVP,
University of Central Oklahoma, February 22, 1997.

PAPER REVIEWER FOR RESEARCH JOURNALS:

PanAmerican Mathematical Journal

Journal of Difference Equations and Applications

Applied Mathematics Letters

Computers & Mathematics with Applications

Journal of Mathematical Analysis and Applications

Electronic Journal of Differential Equations

International Journal of Mathematics and Mathematical Sciences

Taiwanese Journal of Mathematics

Mathematical and Computer Modelling

Acta Applicandae Mathematicae

Journal of Computational and Applied Mathematics

Nonlinear Analysis Series A: Theory, Methods & Applications

Proceedings of the Edinburgh Mathematical Society

JP Journal of Fixed Point Theory and Applications

Portugaliae Mathematica

Indian Journal of Pure and Applied Mathematics

Journal of Applied Mathematics & Computing

Applied Mathematical Modelling

Positivity

Discrete Dynamics in Nature and Society

Advances in Difference Equations

GRANTS FUNDED:

Alternative Delivery (Internet) of Math Concepts I,
DSU Distance Education/Alternative Delivery Summer Grant for 1999

Redesign of the Internet Delivery of Math 341: Math Concepts I,
Summer 2000 Governor Janklow Faculty Award for Teaching with Technology

Internet Delivery of Math Concepts II for Teachers,
Summer 2001 Governor Janklow Advanced Faculty Award for Teaching with Technology

Redesign of Math 102: College Algebra to utilize Tablet PC Technology,
Summer 2004 Governor Rounds Grant.

Mathematics and Technology,
Title II Part-A No Child Left Behind Improving Teacher Quality Program (2004).

Math and Science Inquiry Based Labs,
Title II Part-A No Child Left Behind Improving Teacher Quality Program (2005).

DSU R2R of Math 101,
DSU Title III Re-design of Developmental Courses (2005).

Assessing Basic Skills in Math 341,
DSU Technology Effectiveness Assessment Grants (2005).

Computer Assisted Mathematics Instruction,
Title II Part-A No Child Left Behind Improving Teacher Quality Program (2006).

Interdisciplinary Approaches to Teaching Inquiry Based Science,
Title II Part-A No Child Left Behind Improving Teacher Quality Program (2007).

Glenn R. Berman

College of Arts and Sciences, Dakota State University

EDUCATION:

Doctor of Philosophy in Mathematics

May 2001, Louisiana State University

Research Area: Graph Theory (minors of oriented graphs)

Advisor: Professor Guoli Ding

Master of Science in Mathematics

May 1996, Louisiana State University

Bachelor of Arts in Mathematics

1989 University of California at Santa Cruz

TEACHING EXPERIENCE:

Fall 2001 to Present

Assistant Professor of Mathematics

College of Arts and Sciences, Dakota State University

Fall 1998 to Summer 2001

Instructor of Mathematics

Lynchburg College

Fall 1995 to Spring 1998

Instructor and Graduate Assistant

Department of Mathematics, Louisiana State University

Fall 1991 to Summer 1993

Graduate Teaching Assistant

Department of Mathematics, West Virginia University

Spring 1989 to Spring 1990

Mathematics Teacher

El Cerrito and Pinole Valley High Schools

PUBLISHED RESEARCH PAPERS IN REFEREED JOURNALS:

A Note Concerning a Discrete Two Dimensional Diffusion Problem and Random Walks,
International Journal of Pure and Discrete Mathematics, Volume 14 (2004), Number 1, 103-
109 (with R. Avery).

SUBMITTED RESEARCH PAPERS IN REFEREED JOURNALS:

Discrete Two Dimensional Diffusion Problem on a Half Plane,
Dynamic Systems and Applications, (with R. Avery).

PROFESSIONAL PRESENTATIONS:

MAA Nebraska/Southeast South Dakota Section Meeting,
Orientations of three connected graphs with no K_3^ Minor.*
University of South Dakota, March 28, 2003.

PAPER REVIEWER FOR RESEARCH JOURNALS:

Journal of Mathematical Analysis and Applications

Journal of Computational and Applied Mathematics

GRANTS FUNDED:

Internet Delivery of Trigonometry
Summer 2001 Governor's Grant

Jeffrey S. Palmer

PROFESSIONAL ADDRESS

College of Arts & Sciences
Dakota State University
Madison, SD 57042
Telephone: (605) 256-5190
Electronic Mail: jeff.palmer@dsu.edu

RESIDENCE

821 NW 5th Street
Madison, SD 57042
Telephone: (605) 256-9745

EDUCATION

Washington State University; Pullman, Washington

Ph.D. in Mathematics, May 1990
M.S. in Mathematics, August 1987
Graduate Study in Genetics and Cell Biology, 7/84-5/85

Bemidji State University; Bemidji, Minnesota

Graduate Study in Mathematics, 9/83-5/84
B.S. in Biology, May 1984
B.A. in Mathematics, Summa Cum Laude, May 1983

PROFESSIONAL EXPERIENCE

Professor of Mathematics 8/03-present

College of Arts & Sciences; Dakota State University

Associate Professor of Mathematics 8/97-8/03

College of Natural Sciences; Dakota State University

Assistant Professor of Mathematics 8/91-8/97

College of Natural Sciences; Dakota State University

Visiting Assistant Professor 6/96

Department of Plant Breeding & Biometry; Cornell University

Postdoctoral Research Associate 6/90-6/91

Department of Plant Breeding & Biometry; Cornell University

Graduate Teaching Assistant 6/85-5/87, 8/87-5/88, 8/88-5/89, 8/89-5/90

Department of Pure and Applied Mathematics; Washington State University

Graduate Research Assistant 6/87-8/87, 6/88-8/88, 6/89-8/89

Department of Pure and Applied Mathematics; Washington State University

Graduate Teaching Assistant 8/84-5/85
Program in Genetics and Cell Biology; Washington State University

Graduate Research Assistant 7/84-5/85, 5/90
Program in Genetics and Cell Biology; Washington State University

MATHEMATICS TEACHING EXPERIENCE

College of Arts & Sciences; Dakota State University
Intermediate Algebra, College Algebra, Quantitative Methods, Precalculus,
Trigonometry, Survey of Calculus, Calculus I, Calculus II, Introduction To Statistics,
Mathematics of Games, Foundations of Mathematics, Linear Algebra, Differential
Equations, Math Concepts for Teachers I, Introduction to Probability and Statistics,
Mathematical Modeling, Advanced Special Topics

Department of Pure and Applied Mathematics; Washington State University
Intermediate College Algebra, Precalculus Algebra, Precalculus, Trigonometry, Finite
Mathematics, Calculus for Life Scientist's, Calculus II

Department of Mathematics and Computer Science; Bemidji State University
Basic Algebra, Beginning College Algebra

RELATED EXPERIENCE

Co-Pi for South Dakota Counts in the Middle funded by No Child Left Behind Act, Title II-A;
Black Hills State University, Spearfish, South Dakota; 25-29 June 2012.

Co-Pi for South Dakota Counts in the Middle funded by No Child Left Behind Act, Title II-A;
Black Hills State University, Spearfish, South Dakota; 20-24 June 2011.

Instructor for South Dakota Counts Algebra Institute; Black Hills State University,
Spearfish, South Dakota; 13-17 June 2011.

Co-Pi for South Dakota Counts in the Middle funded by No Child Left Behind Act, Title II-A;
Black Hills State University, Spearfish, South Dakota; 21-25 June 2010.

Instructor for South Dakota Counts Algebra Institute; Dakota State University, Madison,
South Dakota; 14-18 June 2010.

Co-Pi for South Dakota Counts in the Middle funded by No Child Left Behind Act, Title II-A;
Black Hills State University, Spearfish, South Dakota; 8-12 June 2009.

Instructor for South Dakota Counts Geometry Institute; Black Hills State University,
Spearfish, South Dakota; 13-18 July 2008.

Participant in Panel Discussion "The Transition from High School to College
Mathematics" at the SDCTM-SDSTA Spring Meeting; Huron, South Dakota; 7-9 February
2008.

Instructor for South Dakota Counts Algebra Institute; Dakota State University, Madison, South Dakota; 15-20 July 2007.

Participant in Panel Discussion "The Transition from High School to College Mathematics" at the SDCTM-SDSTA Spring Meeting; Huron, South Dakota; 2-3 February 2007.

Participant in Panel Discussion "The Transition from High School to College Mathematics" at the SDCTM-SDSTA Spring Meeting; Huron, South Dakota; 3-4 February 2006.

Participant in Panel Discussion "Bridging the GAP from High School to College Mathematics" at the SDCTM-SDSTA Spring Meeting; Huron, South Dakota; 4-5 February 2005

Prepared and presented a 2-week summer workshop (sponsored by DOE and SDBOR) on Probability and Statistics for High School teachers; USDSU; 19-30 July 2004

Participant in Panel Discussion "Transition from High School to College Mathematics" at the 11th Annual Joint Meeting of the South Dakota Science Teachers Association and the South Dakota Teachers of Mathematics; Huron, South Dakota; 6-8 February 2003.

Invited to present a full day workshop on Ecological Modeling to the Biology Faculty at Northern State University; Aberdeen, South Dakota; 8 January 2003

Member of Panel Discussion "Mathematics Background: High School to College Transition" Ninth Annual Joint Meeting of the South Dakota Science Teachers Association and the South Dakota Council of Teachers of Mathematics. Huron, South Dakota; 1-3 February 2001.

Member of Panel Discussion "Math Placement at SD Public Institutions" Eighth Annual Joint Meeting of the South Dakota Science Teachers Association and the South Dakota Council of Teachers of Mathematics. Huron, South Dakota; 4-5 February 2000.

Presented a Minicourse "Teaching Mathematics With Foraging Games" at the National Council of Teachers of Mathematics Western Regional Conference; Denver, Colorado; 19-21 February 1998.

Developed and presented the mathematical modeling component for an Eisenhower Workshop "Computer-Based Science/Math Studies of Global Change"; Dakota State University; 4-8 August 1997.

Developed and presented a 30 hour workshop "Mathematical Modeling For Secondary Teachers" for the 1995 Joining Forces Summer Institute sponsored by the South Dakota National Science Foundation Statewide Systemic Initiative; 7/95

Attended Creating Connections; 1994 South Dakota Science and Mathematics Teaching Academy sponsored by the South Dakota National Science Foundation Statewide Systemic Initiative; 6/94

Invited participant for workshop "Teaching Differential Equations With Computer Experiments"; Washington State University; 6/93

Taught General Chemistry I and General Chemistry II; Dakota State University; 8/92-5/93

Taught Biology 104, a laboratory course for Biology majors; Washington State University; Spring 1985

Developed computer exercises for use in the genetics portion of Freshman level biology courses; Washington State University; Fall 1984

Conducted problem sessions for a Junior/Senior level Genetics course; Bemidji State University; Spring 1984

RESEARCH EXPERIENCE

Avian biogeography in the Black Hills of South Dakota

Breeding birds of the pine-juniper-shrub habitat of southwestern South Dakota

Experimental and theoretical studies of the foraging behavior of Downy Woodpeckers and Black-capped Chickadees

Investigation of theoretical models in mathematical epidemiology and predator-prey dynamics in patchy environments

Analysis of a deterministic model for axonemal motion

Worked for one year on a plasmid subcloning project employing basic techniques of recombinant DNA technology

Experimental work on the effects of cAMP on cell division

PUBLICATIONS

J.S. Palmer. 2012. The 2012 Summer Season. *South Dakota Bird Notes* 64: 88-96.

J.S. Palmer. 2012. The 2011 Spring Season. *South Dakota Bird Notes* 64: 64-74.

J.S. Palmer. 2012. The 2011-2012 Winter Season. *South Dakota Bird Notes* 64: 44-47.

J.S. Palmer. 2012. The 2011 Fall Season. *South Dakota Bird Notes* 64: 18-27.

J.S. Palmer. 2011. The 2011 Summer Season. *South Dakota Bird Notes* 63: 89-94.

J.S. Palmer. 2011. The 2011 Spring Season. *South Dakota Bird Notes* 63: 61-70.

- J.S. Palmer. 2011. The 2010-2011 Winter Season. *South Dakota Bird Notes* 63: 41-44.
- J.S. Palmer. 2011. The 2010 Fall Season. *South Dakota Bird Notes* 63: 17-27.
- J.S. Palmer. 2010. The 2010 Summer Season. *South Dakota Bird Notes* 62: 93-99.
- J.S. Palmer. 2010. The 2010 Spring Season. *South Dakota Bird Notes* 62: 69-78.
- J.S. Palmer. 2010. The 2009-2010 Winter Season. *South Dakota Bird Notes* 62: 45-48.
- J.S. Palmer. 2010. The 2009 Fall Season. *South Dakota Bird Notes* 62: 17-24.
- J.S. Palmer. 2009. The 2009 Summer Season. *South Dakota Bird Notes* 61: 80-85.
- J.S. Palmer. 2009. The 2009 Spring Season. *South Dakota Bird Notes* 61: 61-70.
- J.S. Palmer. 2009. The 2008-2009 Winter Season. *South Dakota Bird Notes* 61: 41-44.
- J.S. Palmer. 2009. The 2008 Fall Season. *South Dakota Bird Notes* 61: 14-22.
- D.L. Swanson and J.S. Palmer. 2009. Spring migration phenology of birds in the northern prairie region is correlated with local climate change. *Journal of Field Ornithology* 80(4): 351-363.
- J.S. Palmer. 2008. The 2008 Summer Season. *South Dakota Bird Notes* 60: 81-86.
- J.S. Palmer. 2008. The 2008 Spring Season. *South Dakota Bird Notes* 60: 61-71.
- J.S. Palmer. 2008. The 2007-2008 Winter Season. *South Dakota Bird Notes* 60: 44-47.
- J.S. Palmer. 2008. The 2007 Fall Season. *South Dakota Bird Notes* 60: 14-22.
- J.S. Palmer. 2007. The 2007 Summer Season. *South Dakota Bird Notes* 59: 86-91.
- J.S. Palmer. 2007. The 2007 Spring Season. *South Dakota Bird Notes* 59: 62-71.
- J.S. Palmer. 2007. The 2006-2007 Winter Season. *South Dakota Bird Notes* 59: 38-41.
- J.S. Palmer. 2007. The 2006 Fall Season. *South Dakota Bird Notes* 59: 14-23.
- J.S. Palmer. 2006. The 2006 Summer Season. *South Dakota Bird Notes*
- J.S. Palmer. 2006. The 2006 Spring Season. *South Dakota Bird Notes*
- J.S. Palmer. 2006. The 2005 Fall Season. *South Dakota Bird Notes* 58: 11-20.
- J.S. Palmer. 2005. The 2005 Spring Season. *South Dakota Bird Notes* 57: 61-71.
- J.S. Palmer. 2005. The 2004 Fall Season. *South Dakota Bird Notes* 57: 15-23.
- J.S. Palmer. 2004. The 2004 Spring Season. *South Dakota Bird Notes* 56: 67-79.
- J.S. Palmer. 2004. The 2003 Fall Season. *South Dakota Bird Notes* 56: 17-26.
- J.S. Palmer. 2003. The 2003 Spring Season. *South Dakota Bird Notes* 55: 68-79.
- J.S. Palmer. 2003. The 2002 Fall Season. *South Dakota Bird Notes* 53: 13-23.
- D.A. Tallman, D.L. Swanson, and J.S. Palmer. 2002. *Birds of South Dakota*. Midstates Printing Inc., Aberdeen, South Dakota.

- D.L. Swanson, J.S. Palmer, E.T. Liknes, and K.L. Dean. 2002. Breeding avifauna of the restricted pine-juniper-shrub habitat in the southwestern Black Hills. *South Dakota Bird Notes* 54: 34-41.
- J.S. Palmer. 2001. The 2001 Spring Season. *South Dakota Bird Notes* 53: 53-66.
- J.S. Palmer. 2001. The 2000 Fall Season. *South Dakota Bird Notes* 53: 11-19.
- D.L. Swanson, J.S. Palmer, E.T. Liknes, and K.L. Dean. 2000. A breeding population of Virginia's Warblers in the southwestern Black Hills of South Dakota. *Southwestern Naturalist* 45(1): 39-44.
- J. S. Palmer. 2000. The 2000 Spring Season. *South Dakota Bird Notes* 52: 65-75.
- J.S. Palmer. 2000. The 1999 Fall Season. *South Dakota Bird Notes* 52: 16-23.
- J.S. Palmer. 2000. A Late Surf Scoter in Kingsbury County. *South Dakota Bird Notes* 52: 8.
- J.S. Palmer and R.F. Schenck. 2000. A Record Early Sabine's Gull in Kingsbury County. *South Dakota Bird Notes* 52: 9.
- J.S. Palmer. 1999. The 1999 Spring Season. *South Dakota Bird Notes* 51:69-79.
- J.S. Palmer. 1999. The 1998 Fall Season. *South Dakota Bird Notes* 51:19-27.
- J.S. Palmer. 1998. First South Dakota Record of Virginia's Warbler. *South Dakota Bird Notes* 50:89-90.
- J.S. Palmer. 1998. The 1998 Summer Season. *South Dakota Bird Notes* 50:93-100.
- J.S. Palmer. 1998. The 1998 Spring Season. *South Dakota Bird Notes* 50:70-83.
- J.S. Palmer. 1998. The 1997 Fall Season. *South Dakota Bird Notes* 50:17-27.
- J.S. Palmer. 1997. The 1997 Summer Season. *South Dakota Bird Notes* 49:101-107.
- J.S. Palmer. 1997. The 1997 Spring Season. *South Dakota Bird Notes* 49:66-79.
- J.S. Palmer and D.M. Palmer. 1997. Pacific Loon Record for South Dakota. *South Dakota Bird Notes* 49:59-60.
- J.S. Palmer. 1997. The 1996-97 Winter Season. *South Dakota Bird Notes* 49:47-51.
- J.S. Palmer. 1997. The 1996 Fall Season. *South Dakota Bird Notes* 49:21-31.
- J.S. Palmer. 1996. Patch residence times of Downy Woodpeckers. *Proceedings of the South Dakota Academy of Science* 75: 107-110.
- J.S. Palmer. 1996. The 1996 Summer Season. *South Dakota Bird Notes* 48:104-111.
- J.S. Palmer. 1996. The 1996 Spring Season. *South Dakota Bird Notes* 48: 76-87.
- J.S. Palmer. 1996. The 1995-96 Winter Season. *South Dakota Bird Notes* 48: 43-47.
- J.S. Palmer. 1996. The 1995 Fall Season. *South Dakota Bird Notes* 48: 18-27.
- J.S. Palmer and B.M. Carlson. 1995. Teaching the scientific method by means of computer simulation. In: *Computers on Campus, National Conference, Conference Proceedings*; Houston, Texas; 12-15 November 1995.

B.M. Carlson and J.S. Palmer. 1995. Computer simulation of the prey model. In: *Proceedings of the 28th Small College Computing Symposium*; Augustana College, Sioux Falls, South Dakota; 21-22 April 1995.

J.S. Palmer. 1995. The 1995 Summer Season. *South Dakota Bird Notes* 47: 94-99.

J.S. Palmer. 1995. The 1995 Spring Season. *South Dakota Bird Notes* 47: 68-79.

J.S. Palmer. 1995. The 1994-95 Winter Season. *South Dakota Bird Notes* 47: 38-43.

J.S. Palmer. 1995. The 1994 Fall Season. *South Dakota Bird Notes* 47(1): 16-23.

J.S. Palmer and Wei-Jen Harrison. 1994. Interactions and Reactions. In: *Newsletter for the Consortium for Ordinary Differential Equations Experiments*; Winter 1994.

S.P. Blythe, C. Castillo-Chavez, J.S. Palmer, and M. Cheng. 1991. Toward a unified theory of mixing and pair formation. *Mathematical Biosciences* 107: 379-405.

J.S. Palmer, C. Castillo-Chavez, and S.P. Blythe. 1991. State-dependent mixing and state-dependent contact rates in epidemiological models. *Biometrics Unit Tech. Report BU-1122-M*, Cornell Univ., Ithaca, N.Y.

J.S. Palmer, S.P. Blythe, and C. Castillo-Chavez. 1991. Two-group mixing processes and disease dynamics in single-sex populations. *Biometrics Unit Tech. Report BU-1111-M*, Cornell Univ., Ithaca, N.Y.

C.K. Omoto, J.S. Palmer, and M.E. Moody. 1990. Cooperativity in axonemal motion: analysis of a four-state, two-site kinetic model. *Proc. Natl. Acad. Sci.* 88: 5562-5566.

J.S. Palmer. 1990. Deterministic mathematical models for the spread of acquired immunodeficiency syndrome (AIDS): the qualitative impact of potential intervention strategies. Ph.D. Thesis under Dr. Michael E. Moody; Department of Pure and Applied Mathematics; Washington State University; Pullman, Washington; May 1990.

J.S. Palmer. 1989. Important considerations for the control of AIDS. In: *WSU Graduate and Professional Student Association Research Exposition Proceedings*; Washington State University, Pullman, Washington; 10-14 April 1989.

M.E. Moody and J.S. Palmer. 1988. Modelling the spread and control of AIDS. In: *Modelling and Control in Biomedical Systems, Selected papers from the International Federation of Automatic Control Symposium*, C. Cobelli and L. Mariani (Eds.); Venice, Italy; 6-8 April 1988.

PROFESSIONAL PRESENTATIONS

"A Review of the Status and Distribution of the Virginia's Warbler in the Black Hills"; South Dakota Ornithologists' Union Fall Meeting and Paper Session; Brookings, South Dakota; 7-9 October 2011.

"Christmas Bird Count Trends in North and South Dakota"; Climate Change Symposium at the South Dakota Academy of Science Annual Meeting; Oacoma, South Dakota; 8-9 April 2011.

"What Can We Learn From the Online Database"; South Dakota Ornithologists' Union Fall Meeting; Pierre South Dakota; 10-12 October 2008.

“Spring Migration Phenology Correlated With Local Climate Change”; South Dakota Ornithologists’ Union Fall Meeting; Pierre, South Dakota; 10-12 October 2008.

“College Teachers Should Care How Elementary Teachers Understand Algebra – Three Perspectives in the Partnering to Improve K-12 Mathematics”; Rocky Mountain Section MAA Meeting; Black Hills State University; Spearfish, South Dakota; 25-26 April 2008.

“The Development of an On-line Database to investigate the Spatial and Temporal Distribution of South Dakota Bird Records”; Rushmore Regional Conference on Biocomplexity; Sioux Falls, South Dakota; 11-12 August 2004

“Winter Foraging Behavior of Downy Woodpeckers” South Dakota Ornithologists’ Union Fall Meeting; Pierre, South Dakota; October 2000.

"Nonrandom Mixing and Disease Dynamics in Single Sex Populations" invited seminar at the Department of Mathematical Sciences, University of South Dakota, Vermillion, South Dakota; 28 March 2000.

"Interactive Interdisciplinary Learning in Science and Mathematics" 2000 Winter Faculty Development Conference sponsored by The Collaboration for the Advancement of College Teaching and Learning; Minneapolis, Minnesota; 17-18 February 2000.

"Bathtubs, Ice Cubes and Epidemics" Eight Annual Joint Conference of the South Dakota Science Teachers Association and the South Dakota Council of Teachers of Mathematics. Huron, South Dakota; 4-5 February 2000.

"Relative Abundance of Summer Birds at Lake Herman State Park" South Dakota Ornithologists' Union Fall Meeting; University of South Dakota; Vermillion, South Dakota; 1-3 October 1999.

"Dynamical Systems in the Secondary Curriculum: Difference and Differential Equations" National Council of Teachers of Mathematics Western Regional Conference; Denver, Colorado; 19-21 February 1998.

"Interactive Interdisciplinary Learning in Science and Mathematics" 1997 Winter Faculty Development Conference sponsored by The Collaboration for the Advancement of College Teaching & Learning; Bloomington, Minnesota; 20-21 February 1997.

"Initial Results from an Experimental Test of the Patch Model." South Dakota Ornithologists' Union Fall Meeting; South Dakota State University; Brookings, South Dakota; 11-12 October 1996.

"Patch Residence Times of Downy Woodpeckers." Eighty-first Annual Meeting of the South Dakota Academy of Science; South Dakota State University; Brookings, South Dakota; 12-13 April 1996.

"Teaching the Scientific Method via Computer Simulation." Computers on Campus, National Conference sponsored by the University of South Carolina Division of Continuing Education; Houston, Texas; 12-15 November 1995.

"Foraging Games." Midcontinent Institute's Fourth Annual Innovations in Education Conference; Minot State University; Minot, North Dakota; 9-12 November 1995.

"Foraging Games." Third Annual Joint Conference of the South Dakota Science Teachers Association and the South Dakota Council of Teachers of Mathematics. Huron, South Dakota; 3-4 February 1995.

"College Algebra Reform." Second Annual Joint Conference of the South Dakota Science Teachers Association and the South Dakota Council of Teachers of Mathematics; Huron, SD; 4-5 February 1994.

"Species Association Analysis of South Dakota Breeding Bird Atlas Data." Seventy-eighth Annual Meeting of the South Dakota Academy of Science; South Dakota School of Mines and Technology; Rapid City, South Dakota; 16-17 April 1993. Abstract in Proceedings of the South Dakota Academy of Science 72: 288-289.

"State-Dependent Mixing and Sexually Transmitted Disease Dynamics." Seventy-seventh Annual Meeting of the South Dakota Academy of Science; Augustana College; Sioux Falls, South Dakota; 10-11 April 1992. Abstract in Proceedings of the South Dakota Academy of Science 71: 175.

"State-Dependent Mixing and Sexually Transmitted Disease Dynamics." Annual Meeting of the Society for Mathematical Biology; Santa Fe, New Mexico; 18-21 August 1991.

"A Biological Interpretation of the General Solution to the Social/Sexual Mixing Problem." Seminar at the Biometrics Unit Discussion Series; Cornell University; Ithaca, New York; September 1990.

"Social/Sexual Mixing Processes, Mathematics and Biology." Seminar at the Department of Ecology and Systematics; Cornell University; Ithaca, New York; September 1990.

"Sexual Behavior Modification and Control of the AIDS Epidemic." Invited seminar at the Department of Mathematics; Kalamazoo College; Kalamazoo, Michigan; February 1990.

"Important Considerations for the Control of AIDS." Ecolunch seminar at Washington State University; November 1989.

"A Mathematical Model for the Spread and Control of the AIDS Epidemic." Sixty-second Annual Meeting of the Northwest Scientific Association; Tri-Cities University Center; Richland, Washington; 22-24 March 1989. Abstract in Northwest Science 63: 68.

GRANTS AND AWARDS

Co-investigator "South Dakota Counts in the Middle" in association with CAMSE (Center for the Advancement of Math and Science Education) at Black Hills State University; annually 06/08-present

Principle Investigator "The On-line Seasonal Bird Observation Report Database" funded by SDGF&P, 1/03-12/03

Principle Investigator "MACSTECH Scholars" funded through the CSEMS Program of the NSF, 10/02-10/08

Principle Investigator "Avian Biodiversity in the Black Hills- Theoretical Models, Current Trends, and Future Prospects" funded by EPSCoR Research Experiences for South Dakota College Faculty, 5/03-5/04

Principle Investigator "Internet Delivery of Math 102: College Algebra" funded by Governor Janklow's Faculty Awards for Teaching with Technology, 5/01-8/01

Co-investigator "Breeding Birds of the Limited Pine-Juniper-Shrub habitat in Southwestern South Dakota" funded by the U.S. Fish and Wildlife Service Region 6 Neotropical Migratory Bird Program Small Grant Study Proposal; 5/98-7/98

Co-investigator "Breeding Birds of the Restricted Pine-Juniper-Shrub Habitat in Southwestern South Dakota" funded by the SD Department of Game Fish and Parks Wildlife Division Small Grants Program; 5/98-7/98

Co-investigator "Bird Populations of Shelterbelt Habitats in Lake County, South Dakota" funded by the SD Department of Game Fish and Parks Wildlife Division Small Grants Program 5/97-8/98.

Co-investigator "Smart Lab, An Integrated Interdisciplinary Science/Math Laboratory" funded by NSF Division of Undergraduate Education; Dakota State University

Visiting Assistant Professor; Supported by NSF Grant DEB-925370 (Presidential Faculty Fellowship Award) to C. Castillo-Chavez; Cornell University; 6/96

Co-investigator; "Achieving Long-Term Educational Reform Through Systemic Changes in Math & Science Teaching" funded by the South Dakota NSF-SSI; Dakota State University 6/94-6/96

Principle Investigator "College Algebra Reform" funded by a Bush Foundation Summer Instructional Development Grant; Dakota State University; 6/94-8/94

Faculty Research Initiation Grant; Dakota State University; 6/92-6/94

COMMITTEES

College of Arts & Sciences, Dakota State University

Graduate Council; Curriculum Committee; Promotion and Tenure Guidelines Taskforce; Faculty Senate; Faculty Development Planning Committee; Library Committee; Mathematics, Chemistry, Biology, Physics and Computer Science Search Committees; Mathematics Search Committee Chair; Housing Requirements Exemption Committee; College of Natural Sciences Dean Search Committee; Who's Who Committee; University Scholars Program Committee; Mainframe Task Force; Computer Resources Allocation Committee; Student Opinion Survey Committee; Faculty Senate Attendance Policy Committee; Commencement and Honors Committee, Admissions Committee Alternate, Graduate Council

Statewide Mathematics Discipline Council; Chair 9/99-9/00, Chair 9/11-9/12, Member 9/99-present

CURRENT ADDITIONAL ACTIVITIES

Coordinator and compiler for the Madison Christmas Bird Count; 12/06-present

Treasurer: South Dakota Academy of Science

South Dakota Ornithologists' Union Seasonal Reports Editor for *South Dakota Bird Notes*; quarterly journal of the South Dakota Ornithologists' Union

President, Vice President, Board of Directors (*current*), and Rare Bird Records Committee Member (*current*); South Dakota Ornithologists' Union

Consultant for the 2nd South Dakota Breeding Bird Atlas directed by Nancy Drilling, Rocky Mountain Bird Observatory

PRIOR ACTIVITIES

President, Head Elder, and Council Member; Our Savior's Lutheran Church; Brookings, South Dakota

Evaluation Specialist for Bush Faculty Development Grant; Dakota State University

Advisor for Math and Science Club; Dakota State University

Organized College of Natural Sciences Seminar Series; Dakota State University

Prepared species maps for South Dakota Breeding Bird Atlas Project